

Define, Measure, Repeat: An Application of the Iterative Measurement-Theory Link to Distinct
Positive Emotions

Aaron C. Weidman

B.A., Washington University in St. Louis, 2011

M.A., The University of British Columbia, 2013

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Abstract

Social and personality psychologists strive toward theory advancement—or the derivation of truthful and applicable statements about human behavior—while often neglecting the methods that support those theoretical conclusions. In Chapter 1 of this dissertation, I discuss a two-stage process outlining how researchers' measurement decisions are inextricably linked to the theoretical conclusions drawn from individual studies. Stage 1 involves formulating an initial definition and measurement tool for a construct, and Stage 2 involves placing this construct within a nomological network of other constructs. Stage 2 is typically followed by iteration back to Stage 1, when the construct is re-formulated based on the findings from Stage 2. In Chapters 2 and 3, I use this two-stage process as a lens through which to analyze individual constructs of humility and happiness, describing research that constitutes a second iteration through Stage 1 of the measurement-theory cycle. In Chapter 2, I propose a revised definition of humility, showing that humility consists of two dimensions (appreciative and self-abasing humility), whereas prior formulations have measured only one dimension mirroring appreciative humility. In Chapter 3, I propose a revised definition of happiness in the context of discretionary spending on experiential and material purchases, demonstrating that explicitly measuring momentary happiness portrays material things in a more favorable light than has prior work which has measured afterglow happiness. In Chapter 4, I use the two-stage process as a lens through which to analyze the field of subjectively experienced distinct positive emotions, describing research that constitutes a second iteration through Stage 1 of the measurement-theory cycle and a second foray into Stage 2. Specifically, I construct bottom-up definitions and measurement tools for each positive emotion currently studied in the literature based on lay experience, and present the interrelations among these emotions. In Chapter 5, I reflect on lessons learned by comparing a wide range of

literatures through the lens of the measurement-theory cycle, and I outline an agenda for the field of distinct positive emotions, which would build on the work presented in Chapter 4 and progress toward the ultimate goal of constructing a universal taxonomy of basic positive emotions.

Preface

In Chapter 1, I discuss the overarching two-stage process that guides my research, and each of the subsequent chapters. I am the sole author of Chapter 1; however, the latter portions include some content and data drawn from a paper that is currently in press: Weidman, A. C., Steckler, C. M., & Tracy, J. L. (2017). The jingle and jangle of emotion assessment: Imprecise measurement, casual scale usage, and conceptual fuzziness in emotion research. *Emotion, 17*, 267-295. I wrote this manuscript and conducted the majority of the empirical coding of articles that constituted data collection, with input from Conor Steckler and Jessica Tracy. Conor Steckler and Jessica Tracy conducted a subset of the coding.

A version of Chapter 2 is in press: Weidman, A. C., Cheng, J. T., & Tracy, J. L. (in press). The psychological structure of humility. *Journal of Personality and Social Psychology*. I wrote most of the manuscript and designed and conducted Studies 4 and 5, with input from Joey Cheng and Jessica Tracy. Joey Cheng designed and conducted Studies 1, 2, and 3, and wrote portions of the methods and results sections for those studies.

A version of Chapter 3 has been published: Weidman, A. C. & Dunn, E. W. (2016). The unsung benefits of material things: Material purchases provide more frequent momentary happiness than experiential purchases. *Social Psychological and Personality Science, 7*, 390-399. I wrote the manuscript and designed and collected data for Studies 1 and 2, with input from Elizabeth Dunn.

A version of Chapter 4 has been invited for revision: Weidman, A. C. & Tracy, J. L. (invited revision). Picking up good vibrations: Delineating the full range of positive emotions. *Journal of Personality and Social Psychology*. I wrote the manuscript and designed and collected data for Studies 1-5, with input from Jessica Tracy.

In Chapter 5, I reflect on the two-stage process discussed in Chapter 1, as well as future directions stemming from the work presented in the preceding chapters. I am the sole author of Chapter 5.

Table of contents

Abstract	ii
Preface	iv
Table of contents	vi
List of tables.....	xiv
List of figures.....	xvi
Acknowledgements	xvii
Chapter 1: Define, measure, repeat: The iterative measurement-theory link in social- personality psychology	1
1.1 Case 1: Valuing happiness	8
1.1.1 Stage 1: Planting a stake in the ground	8
1.1.2 Stage 2: Vetting the construct	10
1.1.3 Iteration back to Stage 1	11
1.1.4 Conclusion: Speeding down a dead-end street	13
1.2 Case 2: Shame and guilt.....	15
1.2.1 Stage 1: Planting a stake in the ground	15
1.2.2 Stage 2: Vetting the construct	17
1.2.3 Iteration back to Stage 1	23
1.2.4 Conclusion: Consequences of a failure to iterate.....	26
1.3 Case 3: Narcissism	27
1.3.1 Stage 1: Planting a stake in the ground	27
1.3.2 Stage 2: Vetting the construct	28
1.3.3 Iteration back to stage 1	31

1.3.4	Conclusion: Two gold stars.....	35
1.4	Case 4: Depression	36
1.4.1	Stage 1: Planting a stake in the ground	36
1.4.2	Stage 2: Vetting the construct	36
1.4.3	Iteration back to stage 1	38
1.4.4	Conclusion: Still unclear how to proceed.....	42
1.5	The present dissertation: The case of distinct emotions	44
Chapter 2: The psychological structure of humility		55
2.1	Study 1	61
2.1.1	Method.....	61
2.1.1.1	Participants	61
2.1.1.2	Humility words.....	61
2.1.1.3	Procedure	62
2.1.2	Results	62
2.2	Study 2	64
2.2.1	Method.....	66
2.2.1.1	Participants	66
2.2.1.2	Procedure and measures.....	66
2.2.2	Results and discussion	69
2.2.2.1	Humility dimensions.....	69
2.2.2.2	Evaluative valence	72
2.2.2.3	Social desirability.....	73
2.2.2.4	Antecedent events	76

2.2.2.5	Action tendencies	77
2.3	Study 3	79
2.3.1	Method.....	83
2.3.1.1	Participants	83
2.3.1.2	Measures	84
2.3.2	Results and discussion	85
2.3.2.1	Humility dimensions.....	85
2.3.2.2	Evaluative valence	88
2.3.2.3	Social desirability.....	89
2.3.2.4	Emotion and personality profiles	90
2.4	Study 4	94
2.4.1	Method.....	95
2.4.1.1	Participants	95
2.4.1.2	Procedure	96
2.4.2	Results and discussion	97
2.4.2.1	Two forms of humility.....	97
2.4.2.2	Content of humility	98
2.5	Study 5	99
2.5.1	Method.....	100
2.5.1.1	Participants	100
2.5.1.2	Procedure	100
2.5.2	Results and discussion	102
2.5.2.1	Humility manipulation.....	102

2.5.2.2	Event manipulation	103
2.5.2.3	Action tendencies	104
2.6	General discussion.....	104
2.6.1	Toward a nuanced, empirically based understanding of humility	106
2.6.2	Locating humility within the landscape of personality and emotion.....	107
2.6.3	Improving research on humility	110
2.6.4	Limitations and future directions	111
2.6.5	Conclusion.....	114
Chapter 3: The unsung benefits of material things: Material purchases provide more frequent momentary happiness than experiential purchases		
127		
3.1	Study 1	130
3.1.1	Method.....	130
3.1.1.1	Participants	130
3.1.1.2	Procedure	131
3.1.2	Results	132
3.1.2.1	Response rates	132
3.1.2.2	Purchases	133
3.1.2.3	Analytic strategy	133
3.1.2.4	Frequency of momentary happiness	134
3.1.2.5	Intensity of momentary happiness	134
3.1.2.6	Afterglow happiness	134
3.1.3	Discussion	135
3.2	Study 2	136

3.2.1	Method.....	136
3.2.1.1	Participants	136
3.2.1.2	Procedure	137
3.2.2	Results	138
3.2.2.1	Response rates	138
3.2.2.2	Gifts.....	138
3.2.2.3	Analytic strategy	138
3.2.2.4	Frequency of momentary happiness	139
3.2.2.5	Intensity of momentary happiness	139
3.2.2.6	Momentary happiness over time	139
3.2.2.7	Afterglow happiness	140
3.2.3	Discussion	140
3.3	General discussion.....	141
3.3.1	Limitations and future directions.....	142
3.3.2	To do or to have?	143
Chapter 4: Picking up good vibrations: Delineating the full range of pleasant distinct emotions.....		154
4.1	Study 1	160
4.1.1	Method.....	161
4.1.1.1	Initial item pool generation.....	161
4.1.1.2	Participants	164
4.1.1.3	Procedure	165
4.1.1.4	Analyses.....	166

4.1.2	Results	169
4.1.2.1	Sample 1a.....	169
4.1.2.2	Sample 1b	171
4.1.2.3	Sample 1c.....	175
4.1.2.4	Sample 1d	178
4.1.2.5	Sample 1e.....	180
4.1.3	Discussion	185
4.2	Study 2	187
4.2.1	Method.....	188
4.2.1.1	Participants	188
4.2.2.2	Procedure	189
4.2.2.3	Dispositional emotion measures.....	189
4.2.1.4	Analyses.....	191
4.2.2	Results	192
4.2.2.1	Sample 2a.....	192
4.2.2.2	Sample 2b	194
4.2.2.3	Sample 2c.....	196
4.2.2.4	Sample 2d	199
4.2.2.5	Sample 2e.....	202
4.2.3	Discussion and interim summary.....	205
4.3	Study 3	209
4.3.1	Method.....	209
4.3.1.1	Participants and procedure.....	209

4.3.2	Results	210
4.3.2.1	Scale properties	210
4.3.2.2	Intercorrelations.....	210
4.3.2.3	Short scales	210
4.3.2.4	Short scale intercorrelations	211
4.3.2	Discussion	212
4.4	Study 4	214
4.4.1	Method.....	214
4.4.1.1	Participants and procedure.....	214
4.4.2	Results	215
4.4.2.1	Scale properties	215
4.4.2.2	Intercorrelations.....	215
4.4.2.3	Scale means	216
4.4.3	Discussion	217
4.5	Study 5	218
4.5.1	Method.....	219
4.5.1.1	Participants and procedure.....	219
4.5.1.2	Personality measures.....	219
4.5.2	Results	220
4.5.2.1	Scale properties	220
4.5.2.2	Intercorrelations.....	220
4.5.2.3	Nomological network.....	221
4.5.3	Discussion	223

4.6	General discussion.....	224
4.6.1	Implications of Part 1	225
4.6.2	Implications of Part 2	227
4.6.3	Positive emotion nomological networks	229
4.6.4	Implications for future research	232
4.6.4.1	Use short scales	232
4.6.4.2	Consider overlap among positive emotions.....	234
4.6.5	Conclusion.....	235
Chapter 5: Reflecting on iterations, and where distinct positive emotion research goes from here.....		253
5.1	Lessons learned.....	253
5.1.1	Insight 1: Iteration is good science	254
5.1.2	Insight 2: Iteration is heterogeneous.....	255
5.1.3	Insight 3: Beware of two-sided constructs	258
5.2	Where does distinct positive emotion research go from here?	261
5.2.1	Stage 2: Vetting the construct(s).....	263
5.2.1.1	Goal 1: Determining which positive emotions are subjectively distinct	263
5.2.1.2	Goal 2: Establishing basicness of distinct positive emotions	268
5.2.2	Iteration back to Stage 1	273
5.3	Conclusion: Is the present an arbitrary line in the sand?	276
References		280

List of tables

Table 1: Factor loadings of humility-related items at a momentary state level (Study 2) and a dispositional level (Study 3)	115
Table 2: Correlations (and partial correlations controlling for evaluative valence) of state appreciative humility and state self-abasing humility factor scores with on-line cognitions and self-perceptions, as coded from humility narratives (Study 2; Sample 1)	117
Table 3: Correlations (and partial correlations controlling for evaluative valence) of trait appreciative humility and trait self-abasing humility factor scores with emotional dispositions and personality traits (Study 3)	118
Table 4: Humility-related words generated by academic experts (Study 4)	119
Table 5: Humility-related short phrases generated by academic experts (Study 5)	123
Table 6: Descriptive statistics for primary variables (Study 1)	145
Table 7: Descriptive statistics for primary variables (Study 2)	146
Table 8: Inferential statistics for primary variables (Study 1)	147
Table 9: Inferential statistics for primary variables (Study 2)	149
Table 10: Full and short-length distinct positive emotion scales.....	237
Table 11: Descriptive statistics and intercorrelations for state positive emotion scales during a pleasant emotional experience (Study 3)	239
Table 12: Intercorrelations between short and long versions of each positive emotion scale (Studies 2 and 3)	241
Table 13: Descriptive statistics and intercorrelations for trait positive emotion scales (Study 5)	242

Table 14: Correlations among short trait positive emotion scales and related personality constructs (Study 5)	244
Table 15: Intercorrelations between single-item emotion terms and scales for respective positive emotions (Studies 2 and 3).....	246

List of figures

Figure 1: Word cloud depicting humility-related words generated by lay persons (Study 1).....	125
Figure 2: Dendrogram depicting the hierarchical structure of humility-related words (Study 1)	126
Figure 3: Different types of happiness for a purchase.....	151
Figure 4: Frequency of momentary happiness (Studies 1 and 2)	152
Figure 5: Intensity of momentary happiness (Studies 1 and 2)	153
Figure 6: Flowchart displaying the process used to uncover the distinct subjective content of each positive emotion in Part 1.....	247
Figure 7: Pleasantness of each positive emotion (Study 2).....	248
Figure 8: Activation level of each positive emotion (Study 2).....	249
Figure 9: Correlations between dispositional positive emotions and trait positive affect (Study 5)	250
Figure 10: Correlations between dispositional positive emotions and trait negative affect (Study 5).....	251
Figure 11: Network depiction of the interrelations among all positive emotions	252

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Chapter 1: Define, measure, repeat: The iterative measurement-theory link in social-personality psychology

Social and personality psychologists are obsessed with theory; indeed, Greenwald (2012) could easily have been referring to social-personality researchers in particular when he quipped that “psychologists worship excessively at the altar of theory” (p. 99). One must look no further than the current set of editorials from the *Journal of Personality and Social Psychology*’s three editors to substantiate this claim. Elliot Smith, editor of the *Attitudes and Social Cognition Section*, wrote that “my goal is for the signature of a JPSP article to continue to be a genuine advance in theoretical understanding” (2012, p. 1), and Kerry Kawakami, editor of the *Interpersonal Relations and Group Processes* section, wrote that “the primary aim of JPSP, our flagship journal, is to publish research that is innovative and theoretically meaningful, and that serves as a building block to advance our knowledge of social psychological phenomena” (2015, p. 59). Additionally, although Lynne Cooper, in her editorial for the *Personality Processes and Individual Differences* section, advocated for greater acceptance of studies that merely describe—rather than explain—psychological phenomena, she acknowledges that “the more traditional theoretically driven, multi-study experimental package [has typically] been *JPSP*’s bread and butter” (2016, p. 434). The clear message from this trio of editorials is that theoretical novelty is a social-personality psychologist’s golden ticket; it is viewed as the most desirable attribute when evaluating strength of research contributions, and is a prerequisite for publication in the field’s top journals, which itself is a prerequisite for attaining top jobs and grant funding.

Broadly speaking, this theory-worship is justified. Social and personality psychology as academic disciplines each adopt the central goal of understanding human behavior, and theory is essential to accomplishing this goal. Sound theories are comprised of generalizable and broadly

applicable statements about the ways in which people think, feel, and behave. The *Handbook of Theories of Social Psychology* (Van Lange, Kruglanski, & Higgins, 2011a) nicely demonstrates the utility of theory in accomplishing these goals, in that the book's chapters provide insights into human behavior across a wide range of nearly any situation one could imagine. A reader could browse these pages and gain an understanding of such disparate topics as how, when, and why people think abstractly versus concretely (Trope & Liberman, 2011), how people use their feelings to inform their judgments (Schwarz, 2011), how people cope with anxiety about their impending death (Greenberg & Arndt, 2011), how people come to understand their potential for growth, change, or self-improvement (Dweck, 2011), how people gauge their own self-esteem and social status (Leary, 2011), how socialized gender roles shape people's behavior (Eagley & Wood, 2011), and many more. Clearly, any comprehensive understanding of human psychology requires good theories.

Yet theory worship in social and personality psychology has a consequence: Theories begin to be treated as autonomous entities, or as collections of concrete truths regarding human behavior that apply across time and context, and are used to make predictions about future behavior. Theories, in other words, are treated similarly to scientific laws; once codified, it does not matter exactly how they came to be, but rather simply that they are followed, and that they serve as a basis for the formation of future theories. The theories-as-law view has been a historical pillar of social psychology; Jones (1998) notes that theory construction is the primary means by which social psychologists tie individual empirical effects together into coherent explanations about human behavior, and in turn make predictions about future behavior across contexts. The theory-as-law view continues to be echoed to this day; the editors of the aforementioned *Handbook of Theories in Social Psychology* argue that two essential criteria of a

good theory is that it reflects *truth* about human behavior, and that it is *applicable* to explaining human behavior in a wide range of contexts (Van Lange, Kruglanski, & Higgins, 2011b).

What's wrong with viewing theories as laws? ¹ Doing so largely neglects the process through which a theory was derived. Theories do not simply appear out of thin air as grand and generalizable truths about human behavior; rather, they are collections of postulates directly derived from specific empirical findings. The typical theory-driven, multi-study paper that Cooper (2016) referred to as *JPSPs* bread-and-butter advances a generalizable statement about human behavior, but only after substantiating that statement by demonstrating a series of individual empirical effects. More broadly, social psychological theories often rise to prominence based on their ability to explain many specific findings in many separate papers across many years. The upshot is that specific empirical findings are grist for the theoretical mill; theories must be formulated in response to specific empirical findings, and must be amended to the extent that new and/or contradictory empirical findings emerge. It therefore follows that any forces—however mundane—that directly change the nature of empirical findings will in turn directly shape theories.

The goal of this dissertation is to highlight one such force that typically receives little attention in social-personality psychology: researchers' measurement decisions. Researchers' methodological choices can shape empirical findings, and in turn shape theory, in numerous ways, including the use of experimental vs. correlational designs, the use of undergraduate participants vs. community samples, and the choice of whether to conduct a study in the

¹ In light of the current replication crisis in psychological science, researchers have spent considerable time and energy hashing and re-hashing several of the problems with an overreliance on theory. Most prominent among these is the tendency for theory-driven research to go hand-in-hand with confirmatory bias, thereby producing an abundance of positive findings in the empirical literature (Fanelli, 2010), and a file drawer of null findings that never see the light of publication (Rosenthal, 1979; Spellman, 2014). The aim of this dissertation is certainly not to subject the reader to yet another treatise on these well-worn issues; I only discuss one specific problem with overreliance on theory in the sections that follow—namely the accompanying neglect of attention to measurement—though I acknowledge that it is not the only (or even most impactful) one.

laboratory or in the real world. The implications of many of these methodological decisions have been reviewed and debated at length elsewhere, with many researchers taking a relatively critical eye toward the field's modal practices in these domains (e.g., Bless & Burger, 2016; Henrich, Heine, & Norenzayan, 2010; Mitchell, 2012; Mook, 1983). However, relatively little attention has been paid to the very direct effect that measurement decisions have on subsequent theory development. I have therefore chosen to focus on this particular link, given the apparent gap between its profound importance to the field, and its relative neglect in prior critical commentaries.

To explicate the manner in which researchers' measurement decisions influence theoretical conclusions, I will draw on the construct validation literature, and will describe an iterative, two-stage process through which the literature on any given construct in social-personality psychology typically progresses. Stage 1 primarily involves researchers focusing on how to measure a given construct. Specifically, one researcher or team of researchers typically scours the existing literature to arrive at a theory-based understanding of a given construct, and uses this understanding to in turn derive a definition of the construct as well as to create a self-report measure based on this definition. Although this initial scale development process may involve presenting some data speaking to the scale's reliability and validity (e.g., internal consistency, test-retest correlations, convergent correlations with closely related constructs), it tends to be based largely on a top-down, theoretical conceptualization of the construct, rather than a wealth of empirical data. This stage can be thought of as *planting a stake in the ground* by delineating an initial, hypothesized set of boundaries to the construct in question (Smith, 2005). In this stage, the specific subtype of validity emphasized is content validity, or the degree to which a measure captures all relevant aspects of the construct (Bryant, 2000). The utility of the

measure developed to index the construct will rest on the comprehensiveness and completeness of researchers' initial definition; to the extent that a construct is defined in an overly narrow or restrictive manner in Stage 1, such misspecification will color the nature of subsequent empirical studies of that construct in Stage 2.

Stage 2, in contrast, typically involves a primary focus on gaining theoretical insight into the construct in question. Specifically, in Stage 2, an entire field of researchers—often including the researcher who developed the initial theory of the construct in Stage 1—empirically tests the initial definition and measurement tactic by examining the link between the focal construct as operationalized based on the definition formulated in Stage 1 and a host of external constructs. This stage can be thought of as *vetting the construct*, to see how it will perform, in the sense of explaining human behavior, and this stage typically involves the accumulation of considerable empirical data regarding the usefulness of the initial measure developed to assess the construct in question. In this stage, the specific subtypes of validity emphasized are convergent, discriminant, and predictive validity, or the extent to which the focal construct is positively correlated to similar constructs, uncorrelated with dissimilar constructs, and empirically linked to theoretically relevant outcomes (Bryant, 2000). Each of these forms of validity concern the location of the focal construct within a nomological network of theoretically associated constructs, and each new link in this nomological network in turn provides the researcher with a kernel of theoretical insight into the focal construct (Campbell & Fiske, 1959; Cronbach & Meehl, 1955). Critically, as noted above, the contours of these kernels are shaped by the manner in which the researchers initially conceptualized the construct in Stage 1; the nomological network in which the construct is found to sit will stem directly from the specific items with which it was measured in Stage 1.

Importantly, after Stage 2 has been completed, researchers are left with some initial theoretical insight into their construct, in the form of several links in its nomological network. Of course, this theoretical insight may or may not completely align with the field's overall understanding of the construct; in fact, given that the initial definition formulated in Stage 1 was based only on a tentative theoretical understanding of the construct, it is likely that the tests of convergent, discriminant, or predictive validity conducted in Stage 2 may force the original researchers to revise their definition of the construct and the manner in which they measure it. For this reason, following Stage 2, it is critical that the field iterates back to again complete Stage 1; this involves researchers adjusting their conceptualization of the construct and developing new measurement tools to assess a version of the construct that is more in line with the revised definition. After this repetition of Stage 1, the field again moves on to Stage 2 to vet this revised formulation. The two-stage process continues in this iterative manner *ad nauseum*; over time, researchers accrue greater theoretical clarity and insight regarding the construct—based on the repeated improvements they make to how the construct is defined and measured—but they may never reach an end point in this process (Cronbach & Meehl, 1955; Smith, 2005).

As might be apparent from the papers cited in the previous paragraphs, the two-stage process outlined above will sound very familiar to the reader who is well-versed in the literature on construct validation. For over half a century, psychometricians in this tradition have argued that any healthy topic of psychological inquiry should proceed through exactly this type of cycle, and that deriving an understanding of a construct involves an indeterminate process of repeatedly synthesizing, testing, and revising the field's knowledge about that construct (Smith, 2005). Classical theorists of construct validity further argued that this process should involve employing multiple empirical operational definitions of a construct over time; each of these definitions may

provide a slightly different theoretical insight into the construct (Cronbach & Meehl, 1955), but each also brings a unique source of measurement related bias (Campbell & Fiske, 1959), therefore rendering any single operational definition insufficient for yielding a comprehensive understanding. Examining these multiple operational definitions concurrently and repeatedly can, over time, yield more comprehensive insight into the construct. The ongoing, repetitive nature of construct validation leads to one clear conclusion: Iteration, and the give-and-take between measurement and theory that it entails, is crucial to the health of a given subfield.

Despite the fact that this conclusion is supported by the collective knowledge of some of the field's most revered psychometric luminaries, a surprisingly large number of constructs in social-personality psychology never pass through repeated iterations of Stage 1 and Stage 2. Instead, some constructs take only a cursory first pass through Stage 1—involving haphazard attempts to posit a definition and create an ad-hoc measurement tool—before researchers settle on an initial formulation that often fails to adequately reflect the complexity of the construct in question. The result is that misleading theoretical knowledge can accumulate in the field, and empirical inquiry regarding a construct can stagnate.

In Chapter 1 of this dissertation, I present case studies in four literatures across psychological science—including research on valuing happiness, shame and guilt, narcissism, and depression—to more clearly elucidate the two-stage process through which measurement decisions and theory development are and should be linked. I will draw on literatures from both social-personality and clinical psychology, to gain deeper insight into the variety of ways in which the two-stage process can unfold for both the benefit and detriment of individual subfields. Specifically, reviewing these four literatures will show several distinct ways in which repeated iterations through the two-stage process can result in increased clarity regarding the

theoretical nature of a construct, or alternatively how an absence of iteration could lead to the accumulation of flawed theoretical knowledge about a construct.

Following this discussion, I will turn my attention to distinct positive emotions. Using the four literatures reviewed above as points of comparison, I will show how the positive emotion literature has unmistakably stalled after an initial pass through Stages 1 and 2 of the two-stage process. I will then argue that the failure of the positive emotion literature to iterate back to Stage 1 has curtailed researchers' ability to understand the unique theoretical and practical importance of positive emotions. This review will set the stage for Chapters 2, 3, and 4 of this dissertation, each of which present my own research attempts to help the field of positive emotions iterate back to Stage 1.

1.1 Case 1: Valuing happiness

1.1.1 Stage 1: Planting a stake in the ground

The notion that individuals can differ in the extent to which they value happiness was introduced in a series of studies by Iris Mauss and colleagues (i.e., Mauss, Tamir, Anderson, & Savino, 2011; Mauss, Savino, Anderson, Weisbuch, Tamir, & Laudenslager, 2012). A precise definition of *valuing happiness* was not offered in either of these two articles, but the closest approximation appears to be in the following quotation: “Whereas some view [happiness] as a nice thing to have every now and then, others see it as the *sine qua non* of their existence” (Mauss et al., 2011, p. 807). To help clarify the propose nature of the construct, Mauss and colleagues drew an analogy between valuing happiness and setting high standards when pursuing a personal goal; much like a student who strongly values academic success will have high standards in her classes—which could lead to both vigorous pursuit of success as well as severe disappointment when success is not attained—an individual who strongly values happiness may

go to great lengths to attain it, and may feel quite upset when she perceives herself as less than optimally happy (Mauss et al., 2011, p. 807-808). We can surmise from this statement that, although the researchers aimed to capture individual differences in the desire to experience happiness in one's everyday life, they thought of this construct as largely reflecting a cognitive orientation toward and yearning for happiness, rather than the active prioritization and behavioral pursuit of happiness.

Mauss and colleagues (2011; 2012) went on to construct and employ a seven-item scale meant to capture individual differences in valuing happiness. This scale included straightforward items such as “feeling happy is extremely important to me”, as well as items capturing people's feelings of falling short of their ideal level of happiness (e.g., “I would like to be happier than I generally am”), and items capturing some of the consequences of lacking happiness (e.g., “if I don't feel happy, maybe there is something wrong with me”). At first glance, it seems surprising that such a simple construct would require a seven-item assessment tool, particularly given that *happiness* itself is frequently measured with adequate reliability, using just a single item (Lucas & Donnellan, 2012). In fact, it would seem reasonable to assess *valuing happiness* with just the one straightforward item mentioned above. Mauss and colleagues' scale—mirroring their conceptualization of valuing happiness as a cognitive orientation—therefore captured a somewhat more nuanced and multifaceted definition of valuing happiness than might be apparent in their initial definition, one that included several distinct meta-cognitive reflections on an individual's level of happiness as well as the discrepancy (or lack thereof) between this level and his or her desired level of happiness.

1.1.2 Stage 2: Vetting the construct

Once the valuing happiness scale was constructed, Mauss and colleagues (2011, 2012) found, in a series of studies involving both correlational and experimental designs, that valuing happiness was associated with a wealth of maladaptive, psychologically unhealthy outcomes. Individuals who scored higher on valuing happiness reported experiencing more negative affect (vs. positive affect) both in everyday life and in a laboratory setting, scored lower on measures of psychological and subjective well-being, and reported feeling more lonely. The initial empirical evidence therefore suggested that *valuing happiness* is situated in a nomological network of constructs closely linked to *unhappiness*.

These findings regarding the potential for valuing happiness to in fact undermine happiness ran somewhat contrary to existing work in the domain of happiness and well-being, which would suggest that valuing happiness—broadly conceptualized—promotes, rather than undermines, well-being. The accepted wisdom in this community is that effortful and intentional engagement in happiness-enhancing activities is the primary means through which individuals can actively change their chronic level of happiness (Lyubomirsky, Sheldon, & Schkade, 2005), and many positive psychological interventions are predicated on this notion that individuals can intentionally bring about sustainable changes in their happiness (Parks & Layous, 2016). Supporting this position, a recent review suggested that the most effective positive psychological interventions in promoting long-term well-being are those that prompt individuals to make time in their days for specific activities that are known to bring happiness (e.g., acts of kindness; prosocial spending; Quoidbach, Mikolajczak, & Gross, 2015). Most importantly, however, people do in fact use these effective behavioral strategies in an attempt to improve their happiness; Parks and colleagues (2012) found that individuals asked to nominate their own

happiness-enhancing strategies listed numerous everyday activities such as exercising, nurturing social relationships, savoring experiences, and meditating (Parks, Della Porta, Pierce, Zilca, & Lyubomirsky, 2012).

Yet, effortful pursuit of happiness is more of a behavioral strategy, which might constitute an entirely distinct construct than the more cognitive orientation of valuing happiness proposed by Mauss and colleagues (2011). Importantly, though, more recent evidence suggests that even this cognitive orientation may promote rather than undermine well-being. In a recent study, Lyubomirsky and colleagues (2011) recruited a large sample of individuals to participate in a positive psychological intervention that involved writing every day about optimistic thoughts or feelings of gratitude. Critically, a subset of these individuals was recruited after voluntarily enrolling in a study advertised as a “happiness intervention”, whereas other participants were recruited after enrolling in a study advertised as an examination of “cognitive activities”. Results showed that the intervention itself led to greater well-being only among individuals who had self-selected into the happiness intervention (vs. the cognitive activity study), and that the effectiveness of the intervention was positively linked to the amount of effort individuals exerted at the daily writing tasks (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). All of this suggests that individuals who have an explicit cognitive desire to attain high levels of happiness (i.e., those who value happiness) are most likely to experience increases in happiness, contrary to the findings of Mauss and colleagues (2011; 2012).

1.1.3 Iteration back to Stage 1

In light of the conflict between the tenor of much existing literature on valuing happiness, and that of Mauss and colleagues’ (2011; 2012) findings regarding the construct, it is not surprising that the field would iterate back to Stage 1, in an effort to update its thinking on

valuing happiness to move toward a more balanced understanding of the construct. For example, Parks and Layous (2016) noted that Mauss and colleagues' measure captured individual differences in the *desire* for more happiness absent any concrete strategies through which to achieve this goal, and that individuals who possess this combination of *a will and no way* are likely to experience considerable goal frustration and anxiety, which could translate into the observed adverse consequences for well-being. This analysis is consistent with a close inspection of the scale items used by Mauss and colleagues to assess *valuing happiness*; phrases like "I am concerned" (included in the item "I am concerned about my happiness even when I feel happy") and "something wrong with me" (included in the item "If I don't feel happy, maybe there is something wrong with me") capture exactly this type of frustration and anxiety with one's current level of happiness. Broadly speaking, these items introduce a subtle neuroticism component into the scale, which could make the scale artificially prone to capturing a somewhat maladaptive, psychologically unhealthy construct, even though there is not necessarily anything inherently maladaptive or unhealthy about valuing happiness (Simms, 2008). Consistent with this notion, Parks and Layous further argued that individuals who strongly desire happiness and are aware of concrete strategies through which to improve their happiness—in other words, those who have both *a will and a way*—will not experience the same frustration and anxiety when pursuing happiness, and as a result may see these pursuits translate into increased well-being (Parks & Layous, 2016; see also Lyubomirsky et al., 2011).

In a similar vein, Catalino, Algoe, and Fredrickson (2014) recently introduced the construct of *prioritizing positivity*, which can be viewed as the active, behavioral strategy that stands somewhat opposite to the inactive, cognitive orientation captured by Mauss and colleagues' (2011; 2012) *valuing happiness* construct. Catalino and colleagues argued that

prioritizing positivity captures the intentional, effortful choice to make time in one's day for happy activities, in line with the notion that these types of volitional behavioral strategies are the most effective way to increase well-being (Lyubomirsky et al., 2005; Parks & Layous, 2016; Quoidbach et al., 2015), whereas *valuing happiness* captures an excessive desire for more happiness in the absence of concrete strategies for attaining this goal (in line with Parks & Layous, 2016). Catalino and colleagues (2014) subsequently created a six-item scale to measure prioritizing positivity, which captures extent to which people seek out positive emotions in somewhat structured, effortful ways, such as thinking about, planning for, and deciding how to experience them. Not surprisingly, in stark contrast to valuing happiness, individuals high on prioritizing positivity also scored highly on a number of other markers of well-being.

1.1.4 Conclusion: Speeding down a dead-end street

The literature on valuing happiness presents a cautionary tale of what can happen when a field quickly latches on to a definition and measurement strategy offered for a newly introduced construct in its initial pass through Stage 1, without first allowing that construct to be fully vetted in Stage 2 and the iteration back to Stage 1. Mauss and colleagues (2011; 2012) took a relatively broad construct—valuing happiness—and reduced it down to a very specific cognitive orientation toward one's personal level of happiness, and then measured this construct in a manner that infused it with psychologically toxic yearning, insecurity, and feelings of inadequacy. Without a doubt, this cognitively based yearning for happiness—akin to fixating in one's mind on the goal of being an extremely happy person—should be one part of the broad valuing happiness construct, though perhaps it should be qualified with a label such as *extreme*, *severe*, or *exclusive* valuing of happiness. Yet, to equate it with the entire construct of valuing

happiness neglects other important components which have quite divergent implications for well-being.

Luckily, in time the field iterated; some researchers pointed to the substantial literature documenting the beneficial effects of a different side of valuing happiness—active and intentional behavioral pursuit of happiness-enhancing activities—and others began to develop alternative measurement tactics that captured this more psychologically healthy side of the construct (e.g., Catalino et al., 2014; Parks & Layous, 2016). A charitable interpretation of the field's progress is therefore that these two conceptualizations of valuing happiness highlight the need to capture both sides of this construct in order to arrive at an accurate and balanced view of its nomological network. This interpretation would suggest that the field is back at Stage 2, in that researchers—armed with tools to capture both cognitive valuing happiness and behavioral prioritizing positivity—may be ready to build a nomological network for this dual-sided conceptualization of the construct.

There is, however, a less charitable interpretation of the field's progress that also deserves attention: In spite of the field's recent iteration, Mauss and colleagues' (2011) incomplete formulation of valuing happiness left an indelible mark on researchers'—and, perhaps more importantly, the public's—understanding of the construct. Before any iteration could take place, several authors had latched on to and propagated the paradoxical notion that valuing happiness was a one-way ticket to unhappiness. Most prominent were Todd Kashdan and Robert Biswas-Diener, who in 2014 published a popular book entitled *The Upside of Your Dark Side*, the premise of which was that the tendency for people to value and pursue happiness in their daily lives in fact undermined well-being and overall life success. Not surprisingly, Mauss and colleagues' findings regarding valuing happiness were held up front-and-center in Chapter 1

to introduce the reader to the paradoxical notion that the pursuit of happiness is not the desirable panacea it is often made out to be (Kashdan & Biswas-Diener, 2014). Popular books regrettably do not undergo peer review, so one can only assume that the broader research community would have reacted negatively to Kashdan and Biswas-Diener's provocative message, in light of concurrent work on valuing happiness that was being conducted by Catalino, Parks, and Lyubomirsky, and which contradicted the findings of Mauss and colleagues. In lieu of this critical review, and before iteration back to Stage 1 could fully take place, the field sped rapidly down a dead-end street that involved propagating a narrow and misleading view of valuing happiness, rather than proceeding on a main road that would have involved taking more balanced view of how different components of this construct can either promote or undermine well-being. One can only hope that relatively few readers of Kashdan and Biswas-Diener's book followed this side street as well.

1.2 Case 2: Shame and guilt

1.2.1 Stage 1: Planting a stake in the ground

Shame and guilt are two negative self-conscious emotions, in that both arise following the unpleasant recognition that one has fallen short of a personal standard due to an internal cause (i.e., either a personal flaw or a behavioral misdeed; Tracy & Robins, 2004). Treatments of shame and guilt in the middle and latter portions of the 20th century were scarce, yet in the early 1990s, June Tangney brought these two emotions out of obscurity and into mainstream social-personality psychology by introducing them as two pillars of a class of *moral emotions* (Tangney, 1991). Following a prominent theoretical viewpoint from clinical psychology (Lewis, 1971), Tangney argued that shame and guilt could be differentiated based on the extent to which an individual attributes a flaw to the global self or to a specific behavior (i.e., the *self-behavior*

distinction; Lewis, 1971; see also Tangney & Dearing, 2002; Tracy & Robins, 2004). In this view, guilt is thought to arise when individuals make unstable, specific attributions about their flawed behavior, and shame is thought to arise when individuals make stable, global attributions about flaws in their self. Guilty individuals in turn feel regret over their misdeed, and seek to make amends with the offended party, whereas ashamed individuals feel inferior as a result of their personal flaw, and seek to hide from anyone who might be able to witness that flaw (Tangney & Dearing, 2002).

Building off this theoretical distinction, Tangney and her colleagues subsequently published two self-report measures during this period, the State Shame and Guilt Scale (SSGS; Marschall, Sanftner, & Tangney, 1994) which measured momentary shame and guilt, and the Test of Self-Conscious Affect (TOSCA; Tangney, Dearing, Wagner, & Gramzow, 2000), which measured dispositional proneness toward shame and guilt following a variety of hypothetical scenarios. The content of these scales mirrored the proposed *self-behavior* distinction; shame was operationalized primarily through items assessing stable, global attributions, and hiding the self from others, whereas guilt was operationalized primarily through items assessing unstable, specific attributions, and a desire to compensate for a misdeed. For example, one item in the TOSCA asks individuals to consider how they would respond if they realized they had stood a friend up for lunch. The ashamed response is “You would think ‘I’m inconsiderate’”, whereas the guilty response is “You would think you should make it up to him as soon as possible. Similarly, another item asks individuals to consider how they would respond if they broke an object at work. The ashamed response is “You would think about quitting”, whereas the guilty response is “You would think ‘This is making me anxious. I either need to fix it or get someone else to’”. To further empirically distinguish shame and guilt, Tangney and colleagues (e.g.,

Tangney & Dearing, 2002) recommend that researchers using the SSGS or TOSCA examine the links between shame or guilt and dependent measures while controlling for the other emotion (i.e., examining a partial correlation indexing the link between shame and self-esteem, controlling for guilt). This tactic is meant to capture shame-free-guilt and guilt-free-shame, and to help identify the relations between those constructs and outcomes of interest.

1.2.2 Stage 2: Vetting the construct

Not surprisingly, given the stark differences in cognition and behavior between shame and guilt that are built into these measures, work in the last two decades using the TOSCA and SSGS have shown that shame and guilt have quite divergent empirical correlates. As Tangney, Stuewig, and Mashek (2007) note, “On balance, guilt appears to be the more adaptive emotion, benefiting individuals and their relationships in a variety of ways, but there is growing evidence that shame is a moral emotion that can easily go awry” (p. 350). A myriad of findings support this contention: (a) guilt promotes other-oriented empathy, whereas shame impedes it; (b) shame leads to anger and hostility, whereas guilt leads to prosocial and constructive responses to interpersonal quarrels; (c) shame is linked to a range of internalizing psychological symptoms (ranging from low self-esteem to suicidal ideation), whereas guilt is not; and (d) shame promotes antisocial and delinquent behavior, whereas guilt promotes avoidance of these activities (Tangney et al., 2007).

It would be understandable if the field evidenced a mixed reaction to the stark distinctions between shame and guilt portrayed in empirical work using the TOSCA and SSGS. To be sure, the self-behavior distinction between shame and guilt, on which these measures are based, has received a great deal of empirical support in the intervening years, both from correlational studies in which researchers assess individuals’ thoughts, feelings, and action

tendencies during shame and guilt episodes, and experimental studies in which self- or behavior-related appraisals are induced and subsequent shame and guilt are measured. In correlational studies, for example, Wicker, Payne, and Morgan (1983) found that individuals asked to recall episodes of guilt (vs. shame) reported being more active, capable, and in control; Tangney, Miller, Flicker, and Barlow (1996) found that individuals recalled episodes of guilt (vs. shame) as involving a greater desire to affiliate with others; and Tracy and Robins (2006) found that recalled guilt episodes involved more controllable causes than shame episodes. Feelings of control over one's behavior and a desire to affiliate, in turn, could signify a desire to make up for a misdeed, consistent with the proposition that guilt arises from undesirable behaviors (Tangney & Dearing, 2002). In contrast, Wicker and colleagues (1983) found that individuals asked to recall episodes of shame reported feeling less confident and more submissive, and Tangney and colleagues (1996) found that episodes of shame were recalled as involving a greater desire to withdraw from others, both of which could signify dissatisfaction with the self, and a desire to hide a personal flaw from others, in line with the proposition that shame arises when one perceives a self-flaw (Tangney & Dearing, 2002).

In experimental studies, Tracy and Robins (2006) found that individuals anticipated feeling more shame following personal failures that arose from stable, uncontrollable causes (i.e., self-flaws), whereas individuals anticipated more guilt following failures that resulted from unstable, controllable causes (i.e., behavioral misdeeds). Similarly, Brown and Weiner (1984) found that individuals anticipated more intense guilt than shame following a failure that was attributable to lack of effort, compared to one due to lack of ability, and Smith and colleagues (2002) found that individuals anticipated more shame than guilt following a personal failure that was due to a stable self-flaw. Additionally, Niedenthal, Tangney, and Gavinski (1994) presented

individuals with scenarios that involved personal mishaps, but that were ambiguous with respect to whether they would elicit shame or guilt, and then randomly assigned participants to generate either self-related or behavior-related counterfactuals (i.e., “If only I weren’t so...” vs. “If only I hadn’t done...”). Participants who generated self-related counterfactuals subsequently anticipated feeling more shame about the situation, whereas participants who generated behavior-related counterfactuals anticipated feeling more guilt.

Yet, support for the self-behavior distinction has not been uniform, and indeed some evidence *against* the self-behavior distinction has emerged from the very studies that have supported it. For example, in correlational studies, Tangney and colleagues (1996) found that episodes of shame and guilt did not differ in the extent to which individuals recalled blaming the self, compared to blaming their actions, nor did they differ in the extent to which individuals reported wanting to make amends, or wishing they had acted differently (which is presumed to follow a behavioral misdeed, not a self-flaw; Tangney & Dearing, 2002). Similarly, Tracy and Robins (2006) found that recalled shame and guilt episodes did not differ on the extent to which they were caused by stable (vs. unstable) factors, and Smith and colleagues (2002) found that, in classical literary texts, passages describing shame and guilt were equally likely to portray a character as feeling like she is a deficient or defective person, or that she wants to change a stable aspect of the self, both of which would presumably go more with shame than guilt (Smith, Webster, Parrot, & Eyre, 2002). Importantly, no studies have provided evidence that the self-behavior distinction is *reversed* (i.e., that guilt is linked to self-attributions for flaws and withdrawal behaviors, and shame is linked to behavioral attributions for flaws and approach behaviors). Yet, the self-behavior distinction clearly predicts unidirectional differences between

shame and guilt on axes capturing attributions and behavioral action tendencies, so any evidence that the emotions do not differ on these axes runs contrary to the theory.

More importantly, setting aside the exact strength of supporting evidence for the self-behavior distinction, an abundance of research has clearly shown that shame and guilt are by and large *similar*, rather than distinct, emotions. Anecdotally, Helen Block Lewis, the original proponent of the self-behavior theory, herself pointed out that “when shame and guilt are both evoked in the context of a moral transgression, the two states tend to fuse with each other...” (p. 35). More to the point, Tracy and Robins’ (2004) influential model of self-conscious emotions supports this claim, in that it posits shame and guilt to both arise when (a) an individual’s attention is focused on the self, and (b) he or she attributes an undesirable self-relevant outcome to an internal cause, rather than external forces. Subsequent experimental evidence supported this process; for example, individuals anticipated feeling more shame and guilt (vs. basic emotions such as anger and fear) when confronted with undesirable self-relevant events that were attributable to internal causes, as opposed to situational factors (Tracy & Robins, 2006, Study 4). It is therefore not surprising that, even in studies that set out to examine possible differences in the cognitive appraisals that lead to shame, guilt, and other emotions, shame and guilt often are so highly correlated that they load strongly on the same factor, and are therefore treated as one and the same emotional experience (e.g., Russell & McAuley, 1986; see Barrett & Russell, 1998, and Watson, Clark, & Tellegen, 1988, for similar results). In sum, although the self-behavior distinction currently outlines the best axis along which to delineate shame and guilt—and shame and guilt do differ to an extent on this dimension—a wealth of evidence suggests that these two emotions are at least as similar, if not more so, than they are different. Wicker and colleagues

(1983) put it well in stating that empirical differences between shame and guilt are likely ones of “degree and not direction” (p. 38).

If shame and guilt in fact differ only by degree and not direction, then there would appear to be a mismatch between the true level of distinctiveness between these emotions, and the level of distinctiveness with which they are measured, for two reasons. First, by employing a scale in which self-related attributions always go with shame, and behavior-related attributions always go with guilt, Tangney and colleagues determined *a priori* that one could never feel shame following a behavioral misdeed attribution, and could never feel guilt following a self-flaw attribution; given the evidence reviewed above, this is likely an oversimplification. Second, by focusing on shame-free-guilt and guilt-free-shame—rather than raw scale scores that reflect guilt and shame—Tangney and colleagues’ measurement tactic empirically removes real phenomenological components of shame and guilt that are part and parcel to their everyday manifestations (i.e., internal attributions, self-focus, unpleasantness; Tracy & Robins, 2004; 2006), simply because these components happen to be shared between the two emotions. In other words, shame-free-guilt and guilt-free shame *are not real emotional feelings*, in that individuals do not feel guilt without shared components of shame, or vice versa; this is supported by the fact that the TOSCA shame and guilt raw scale scores typically correlate around .50 (Paulhus, Robins, Trzesniewski, & Tracy, 2004), and ratings of the words “shame” and “guilt” typically correlate even higher (Barrett & Russell, 1998; Watson et al., 1988). To borrow an analogy from Coyne (2013), removing all shared content between shame and guilt when measuring the two is akin to viewing photographs of two siblings after all superficial similarities between the siblings have been removed; what would remain of the siblings’ physical appearance would hardly provide an accurate representation of how the sibling actually looks. In a similar manner,

although the TOSCA and SSGS are fine measures of the somewhat distinct attributional and behavioral styles thought to accompany shame and guilt, they are not good representations of the complete emotional experiences of shame and guilt.²

Moreover, a recent meta-analysis by Tignor and Colvin (in press) underscored how this divergence between theory and measurement in the literature on shame and guilt can adversely shape how the two emotions are portrayed. The authors collected all studies that had examined the link between shame and guilt and a range of adaptive outcomes, including empathy, morality, forgiveness, and inhibition of hostility. These studies were coded for whether shame and guilt were assessed using scenario-based measures (the vast majority of which involved the TOSCA), or checklist-based measures (i.e., measures in which respondents were asked to endorse emotion words related to shame and guilt). When examining effects in the manner prescribed by Tangney and colleagues (i.e., controlling for guilt when examining the effect of shame, and vice versa), the typical pattern emerged: Guilt correlated positively ($r = .20$) with a composite of adaptive outcomes, whereas shame correlated negatively ($r = -.13$) with these same outcomes. Yet, when zero-order correlations were examined (i.e., when shame and guilt were not used as mutual controls), these effects became weaker ($r_s = .13$ for guilt and $-.05$ for shame). Furthermore, whereas the typical pattern of effects emerged when examining scenario-based measures ($r = .20$ with adaptive outcomes for guilt, and $r = -.05$ for shame), checklist measures produced a similar pattern of effects for the two emotions ($r = -.07$ with adaptive outcomes for guilt, and $r = -.13$ for).

² Admittedly, there may be empirical utility to assessing the unique components of shame and guilt, in order to isolate the predictive or causal effect of these components apart from the more general “negative self-consciousness” that is common to both emotions (see Paulhus et al., 2004, p. 315, for similar argument). For example, a researcher might wish to know whether a behavioral (vs. self-focused) attribution is the active ingredient linking guilt to moral behavior. However, if researchers wish to measure and examine these more narrow, artificial experiences, it seems important to acknowledge them as such when framing empirical findings (i.e., one could write a paper about “the behavioral-attribution style associated with guilt” rather than a paper on “guilt”).

Taken together, these findings suggest that the established narrative regarding the effects of shame and guilt in everyday life (i.e., “guilt is good, shame is bad”) is largely a product of the decision to assess these two emotions with the TOSCA, a scenario-based measure that confounds the core cause of each emotion (i.e., negative self-evaluation vs. a sense that one has behaved in a wrongful manner) with two sets of subsequent action tendencies that can have starkly distinct consequences (i.e., maladaptive withdrawal vs. adaptive repair; Paulhus et al., 2004). When shame and guilt are assessed with checklist measures that capture their organic naturally occurring similarities, they produce a more homogeneous set of effects on morality and interpersonal behavior (Tignor & Colvin, in press). Of course, checklist measures have their own drawbacks, namely that lay persons do not make fine-grained distinctions between single emotion words related to shame and guilt (e.g., Barrett & Russell, 1998; Russell & McAuley, 1986; Watson, Clark, & Tellegen, 1988). To the extent that shame and guilt *do* differ even by degree in their antecedent cognitions or resultant action tendencies, the use of checklist measures will preclude these differences from emerging. Checklist measures therefore may be as problematic as the TOSCA—albeit in the opposite manner—by forcing shame and guilt to appear artificially homogeneous. In light of the unsatisfactory nature of the TOSCA and checklist measures, it seems that a healthy iteration for the field would involve a new formulation of shame and guilt that allows their various antecedent cognitions and behavioral action tendencies to associate freely in line with their true level of experiential distinctiveness.

1.2.3 Iteration back to Stage 1

In recent years, such an iteration has taken place, in a program of research by Cohen and colleagues (Cohen, Panter, Turan, Morse, & Kim, 2014; Cohen, Wolf, Panter, & Insko, 2011). These researchers have argued that prior work on shame and guilt has overemphasized the self-

behavior distinction, and that a second, often forgotten distinction—the *private-public distinction*, according to which transgressions that remain privately known by the perpetrator elicit feelings of guilt, whereas transgressions that become known to the public elicit feelings of shame (Benedict, 1946)—could prove fruitful. Indeed, this theory received empirical support in a study by Smith and colleagues (2002), who found that individuals anticipated more intense feelings of shame (but not guilt) following public (vs. private) transgressions, and found that classical literary texts referred to shame more frequently in public (vs. private) social contexts, whereas the opposite was true for guilt.

Following the *public-private* distinction, Cohen and colleagues (2011) constructed a dispositional measure of the tendency to experience shame and guilt (the Guilt and Shame Proneness Scales, or GASP), in which all guilt scenarios involved private transgressions, whereas shame scenarios involved public transgressions. This measure also included separate subscales capturing negative self-evaluations, negative behavior-evaluations, repair action tendencies, and withdrawal action tendencies. Although Cohen and colleagues labeled the negative behavior-evaluation and repair action tendencies as “guilt” and the negative self-evaluation and withdrawal action tendencies as “shame”, they emphasized that the purpose of creating four distinct subscales was to allow researchers to test the independent effects of each of these four components of shame and guilt, without *a priori* assuming that certain components go with shame and certain components go with guilt (Cohen et al., 2011).

Importantly, work employing the GASP has begun to paint a slightly different empirical picture of shame and guilt than the substantial body of work employing the TOSCA and SSGS. Cohen and colleagues (2011; 2014) have found that withdrawal action tendencies predicted increased engagement in a range of delinquent and unethical workplace behaviors (e.g., being

rude to clients, leaving work early, stealing from or vandalizing the workplace), and decreased engagement in organizational citizenship behavior (e.g., mentoring co-workers, changing shifts to accommodate others). In contrast, negative self- and behavior-evaluation, as well as repair action tendencies, had the exact opposite profile of correlations. Substantiating these analyses, Cohen and colleagues (2014) found that high scores on withdrawal action tendencies characterized a group of individuals whose overall personality profiles suggested low moral character, whereas high scores on the other three components indicated high moral character. These findings, combined with the finding that negative self- and behavior-evaluations, as well as repair action tendencies, all correlate positively—whereas withdrawal action tendencies are relatively orthogonal to these other three components (Cohen et al., 2011)—suggest that withdrawal action tendencies are the active immoral ingredient in negative self-conscious emotions. Yet, as noted above and by Cohen and colleagues (2011), withdrawal action tendencies do not exclusively occur during episodes of shame rather than guilt, pointing to the need to isolate withdrawal tendencies when measuring shame and guilt (Cohen et al., 2011). This also helps explain why the TOSCA and SSGS—which conflate withdrawal action tendencies with shame—necessarily portray shame as a less moral and adaptive emotion than guilt.

Additional work has also questioned the field's traditional understanding of shame and guilt. Consistent with Cohen and colleagues (2011; 2014), Leach and Cidam (2015) argued that experiencing shame does not automatically lead to withdrawal action tendencies; rather, they argued that shame can in fact lead to constructive repair action tendencies in situations in which the ashamed individual had a chance to amend his or her fault through self-improvement or appeasement of others. Meta-analytic results supported this contention; shame was positively linked to repair action tendencies in situations which provided the opportunity to make amends,

whereas shame was negatively linked to repair action tendencies in situations that did not afford such opportunity (Leach & Cidam, 2015). Critically, this meta-analysis focused only on momentary shame episodes, and did not examine dispositional shame proneness; as a result, the meta-analysis did not include any studies using Tangney and colleagues' (2000) TOSCA which, as noted above, automatically conflates shame and withdrawal action tendencies. These findings suggest that, when shame is measured in a way that decouples it from withdrawal action tendencies, it can actually be linked to either repair *or* withdrawal action tendencies—and, in turn, can be either adaptive/moral or maladaptive/immoral—depending on situational moderators.

1.2.4 Conclusion: Consequences of a failure to iterate

Shame and guilt have undergone a somewhat protracted journey through the two-stage process linking measurement and theory. For nearly two decades following the introduction of the TOSCA and SSGS, the shame and guilt literature was characterized by a *failure to iterate*, in that the TOSCA and SSGS remained the primary tools through which shame and guilt were measured, despite the fact that they do not adequately represent the theoretical relation between the two emotions. Instead of iteration, the field saw the accumulation of two-sided empirical findings regarding shame and guilt, and the eventual entrenchment of the narrative that guilt is good and shame is bad (Tangney et al., 2007). Only time will tell whether this narrative remains influential in the field, but given its prominence it may be difficult for the field to ever come to view shame as potentially adaptive or guilt as potentially maladaptive.

Thankfully, in recent years, a movement in this direction has occurred, and the literature on shame and guilt has finally iterated back through Stage 1. The work by Cohen and colleagues (2011; 2014) and Leach and Cidam (2015) has helped refine the field's operational definition of

shame and guilt, as well as the manner in which these two emotions are measured. This work has in turn begun to change the theoretical narrative surrounding these two emotions, particularly by painting a more nuanced, less uniformly maladaptive, view of shame. According to two-stage measurement-theory process discussed above, it is now time for the field to move back to Stage 2, in which researchers will evaluate this new conceptualization of shame and guilt as measured with tools such as the GASP, in an effort to determine whether a new set of empirical findings align with a satisfactory theoretical portrayal of the two emotions.

1.3 Case 3: Narcissism

1.3.1 Stage 1: Planting a stake in the ground

The construct of narcissism has much longer history in psychological science than either shame and guilt or valuing happiness. The construct—which finds its origin in the Greek myth of Narcissus, a man who loved to gaze at his own reflection—was first formally labeled prior to the turn of the 20th century by British sexuality researcher Havelock Ellis (1898). Early psychoanalysts such as Sigmund Freud and Karen Horney subsequently conceptualized narcissistic personality as a process involving unconscious self-defense against negative evaluation which manifested in inflated self-views outward shows of grandiosity (Freud, 1914; Horney, 1939). Later psychoanalysts conceptualized narcissistic personality as more of a developmental disorder resulting from early parental rejection or indifference, which leads a child to develop self-defensive strategies involving egotism and grandiosity (Kernberg, 1975; Kohut, 1971; for a thorough review of the many theoretical perspectives that have informed research on narcissism over the years, see Levy, Ellison, & Reynoso, 2011). For the purposes of the present exercise, it is worthwhile to note that early accounts of narcissism contrasted its grandiose external veneer with a more fragile intrapsychic core.

Despite the substantial interest in the topic throughout the 20th century, until the 1980s there existed no consensual, empirically based strategies for assessing narcissism. Two developments helped to fill this lacuna. First, in 1980, Narcissistic Personality Disorder (NPD) was introduced as an official diagnostic category in the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition* (DSM-III; American Psychiatric Association, 1980). NPD was diagnosable if an individual exhibited at least five out of nine official diagnostic criteria, including (a) having a grandiose sense of self-importance; (b) requiring constant attention or admiration; (c) preoccupation with fantasies of unlimited success or power; (d) believing that one's problems are unique; (e) showing interpersonal exploitativeness; (f) lacking empathy for others; (g) preoccupation with feelings of envy toward others; and (h) reacting to criticism with feelings of rage and shame. Second, Raskin and Terry (1988) validated a 40-item version of the Narcissistic Personality Inventory (NPI, originally developed by Raskin & Hall, 1979); the NPI was written to capture individual differences in the features identified in the *DSM-III* as characteristic of narcissism. The construction of the NPI based on the definition of NPD codified in the *DSM-III* can be thought of as the social personality psychology's initial empirical stake in the ground, primarily because the vast majority of the field's empirical research on narcissism in the subsequent two decades used the NPI total score to index the construct.

1.3.2 Stage 2: Vetting the construct

Empirical findings resulting from the use of the NPI total score have portrayed narcissism as playing an essential role in a variety of life domains, largely in line with its characterization in the *DSM-III*. For example, in line with the notion that narcissists have a grandiose sense of self-importance and are preoccupied with fantasies of success or power, studies using the NPI have portrayed narcissists as charismatic leaders, particularly in early stages of interpersonal

relationships (e.g., Brunell, Gentry, Campbell, Hoffman, Kuhnert, & DeMarree, 2008; Deluga, 1997; Paulhus, 1998). Similarly, in line with the notion that narcissists may react to criticism with aggression, studies using the NPI have shown that narcissists lash out against others when they perceive their self-esteem as having been threatened, particularly when such aggression is directed toward the person who initiated the threat (e.g., Bushman & Baumeister, 1998). Additionally, consistent with the notion that narcissists show exploitative interpersonal tendencies and lack empathy for others, studies using the NPI have shown that narcissists primarily initiate romantic relationships for the purpose of buttressing their own self-image through admiration from their partners, and once involved in romantic relationships narcissists string their partners' along in a game of uncertainty, and fail to show true care or concern for their partners' well-being (Campbell, 1999; Campbell, Foster, & Finkel, 2002).

Despite the fact that this and other work using the NPI has made narcissism one of the “hot” topics in social-personality psychology over the last decade (Campbell & Miller, 2011), the field has begun to express its discontent with the NPI as a gold standard measurement tool for assessing narcissism. The primary source of this criticism is the problematic finding that the NPI—which is typically treated as a unidimensional instrument through the use of its total score—is likely comprised of several very distinct dimensions. Indeed, hints of this finding can be seen in the NPI's origins; Raskin and Terry (1988) themselves used principal components analysis to advocate for seven distinct dimensions within the NPI, and the intercorrelations among these dimensions were weak to moderate on average ($r_s = .11-.42$), indicating a great degree of heterogeneity. Subsequent clues regarding the NPI's multidimensionality and heterogeneity come from the literature examining its empirical correlates; specifically, it would take an extremely broad and overarching theory to conceptualize a construct that at once is

linked to charismatic leadership, hostile aggression following self-threat, and a callous lack of care for intimate partners—all of which are linked to narcissism as assessed with the NPI.

A more parsimonious explanation for these diverse findings may be that the NPI assesses multiple distinct constructs. Following this line of reasoning, Ackerman and colleagues (2011) used factor analytic methods to demonstrate that the majority of items in the NPI load on factors of Leadership-Authority (LA; i.e., the tendency to view oneself as a great leader, a special person, and as influential over others) and Grandiose Exhibitionism (GE; i.e., the tendency to show off, display one's desirable qualities, and enjoy compliments), whereas a small number of items load on an Exploitativeness-Entitlement factor (EE; i.e., the tendency to seek undue recognition and manipulate others). Importantly, these three NPI factors were observed to show distinct sets of convergent correlations. The LA and GE factors showed a largely adaptive set of correlations, including positive correlations with extraversion and self-esteem, though also a weak, negative correlation with self- and informant-reported agreeableness, whereas the EE factor showed a more maladaptive pattern of correlations, with a strong and negative link to self-esteem and both self- and informant-reported agreeableness, a positive link with self-reported neuroticism, and a negative link with informant-reported openness and conscientiousness. Corroborating this finding, subscales based on the LA and GE factors were correlated more strongly ($r = .43$, than either other pair of subscales ($r_s < .31$; Ackerman, Witt, Donnellan, Trzesniewski, Robins, & Kashy, 2011).

Given that the LA and EE factors together include 21 NPI items, whereas the EE factor includes only 4, the NPI total score can be thought of as primarily a representation of the more adaptive components of narcissism. As a result, Ackerman and colleagues (2011) noted that researchers who assess narcissism with the NPI will primarily capture the extent to which an

individual is an authoritative, confident, influential, and looking out for him or herself, despite the fact that narcissism may have other, more maladaptive components. The recently developed NPI-16, an abridged form of the NPI (Ames, Rose, & Anderson, 2006), suffers from the same problems as the NPI. It primarily captures an adaptive, grandiose form of the construct, and is mostly comprised of items from Ackerman and colleagues (2011) LA and GE factors. Not surprisingly, it is also positively correlated with extraversion and self-esteem, and negatively with agreeableness (Ames et al., 2006).

1.3.3 Iteration back to stage 1

The above results suggest that the NPI captures multiple dimensions, and in line with the notion that the field should now shift back to Stage 1, definitions of the construct have indeed begun to reflect this notion. Researchers within both social-personality psychology and clinical psychology—the two areas in which the roots of narcissism research lie—have begun to explicitly conceptualize narcissism as involving two distinct sides: *grandiose narcissism* and *vulnerable narcissism* (Miller & Maples, 2011; Pincus & Lukowitsky, 2010). Grandiose narcissistic characteristics involve aggression and exploitation of others, self-enhancement and delusions of grandeur, and lack of empathy, whereas vulnerable narcissistic characteristics involve shame over one's personal shortcomings, low or contingent self-esteem, and hypersensitivity to interpersonal criticism and rejection. These two conceptualizations are clearly at odds—portraying the narcissist as both bombastic, egotistical, and manipulative, as well as withdrawing, insecure, and shy—highlighting the importance of openly acknowledging the two-sided nature of the construct. This typically involves labeling and describing the specific form of narcissism (i.e., grandiose or vulnerable) that is under consideration in individual studies, and moving toward a research literature in which grandiose and vulnerable narcissism are each

treated as independent constructs (Miller & Maples, 2011; Pincus & Lukowitsky, 2010). Indeed, in the introduction to the recently published *Handbook of Narcissism and Narcissistic Personality Disorder*, Campbell and Miller (2011) argued that the field as a whole is increasingly moving in this direction.

Now that the field has recognized that narcissism as assessed in *DSM-III* and the NPI is a multidimensional construct, and has begun to conceptualize grandiose and vulnerable narcissism as distinct constructs, the next natural stage in the iterative process linking measurement and theory is to construct and utilize new measurement tools that more directly capture one of these two forms of narcissism. A considerable amount of work has indeed been conducted in this vein. An early effort—which ironically presaged the explicit acknowledgement that narcissism—comes in two forms involved the development of the Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997), a 10-item scale meant to capture the more vulnerable side of narcissism, including people’s tendency to be preoccupied with their own affairs, sensitive to criticism, and in need of others’ regard. More recently, Ackerman and colleagues (2011) constructed brief subscales to measure each of the three factors they identified within the NPI, and advocated for their use in lieu of the NPI total score. For example, a researcher interested in capturing the more adaptive, grandiose side of narcissism could explicitly use the items from the LA and GE subscales.

Another example of a nuanced approach to measuring narcissism comes from Back and colleagues (2013), who constructed a scale to measure the two sides of narcissism, which they labeled narcissistic admiration and narcissistic rivalry. Although Back and colleagues (2013) conceptualized these two dimensions as two sides of grandiose narcissism, the two constructs clearly correspond to narcissistic grandiosity and vulnerability. Much like grandiose narcissists,

individuals high on narcissistic admiration strive for short-term assertion and self-promotion, and aim to show others that they are a star by showing off their uniqueness and charm. In contrast, much like vulnerable narcissists, individuals high on narcissistic rivalry strive to defend themselves from challenges to their supremacy, preventing others from tearing them down through devaluing others and lashing out when challenged (Back, Küfner, Dufner, Gerlach, Rauthmann, & Denissen, 2013). Back and colleagues (2013) subsequently developed the Narcissistic Admiration and Rivalry Questionnaire (NARQ) to measure each form of narcissism; the narcissistic admiration scale consists of subscales capturing grandiosity, sense of one's own uniqueness, and charm, whereas the narcissistic rivalry scale consists of subscales capturing devaluation of others, supremacy, and aggression.

As a final example, Pincus and colleagues (2009) developed the Pathological Narcissism Inventory (PNI), a scale meant to capture the full range of narcissistic grandiosity and vulnerability. The PNI has seven subscales, the core content of which is largely redundant with that of other, narrower measures of narcissism, such as Ackerman and colleagues' (2011) NPI subscales, the NARQ, and the HSNS. For example, the contingent self-esteem subscale—the longest subscale in the PNI—contains similar content to the HSNS; the exploitativeness subscale contains similar content as the EE subscale of the NPI; and the entitlement-rage subscale contains similar content as the NARQ Rivalry scale. Yet, as the name suggests, the PNI is explicitly written to capture the more maladaptive components of the construct linked to vulnerable narcissism; perhaps not surprisingly, the total PNI score correlates .62 with the HSNS. The PNI therefore provides researchers with a means through which to measure a broadly conceptualized version of narcissism, while primarily focusing on the more vulnerable components (Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009). This provides a nice

compliment to Ackerman and colleagues' (2011) NPI subscales, which contain a preponderance of items capturing grandiose narcissism.

The most fruitful result of the field's efforts to redefine narcissism and construct new measures that reflect the dual-sided nature of the construct is that subsequent empirical studies have begun to use these measures to determine the distinct correlates of grandiose and vulnerable narcissism. Most notable is a recent particularly comprehensive analysis by Miller and colleagues (2011). Participants were asked to complete several narcissism measures and a comprehensive set of personality, emotion, and psychopathology questionnaires. Miller and colleagues operationalized grandiose narcissism with factor scores primarily representing the more adaptive items from the NPI, whereas they operationalized vulnerable narcissism using factor scores primarily representing several of the most maladaptive PNI subscales and the HSNS. Although both forms of narcissism were linked to low agreeableness, grandiosity was characterized by high extraversion and moderate to low neuroticism and negative affectivity, whereas vulnerability was characterized by high neuroticism and negative affectivity, and moderate to low extraversion. In addition, vulnerability, and not grandiosity, was uniquely linked to a range of psychopathologies and personality disorders (Miller, Hoffman, Gaughan, Gentile, Maples, & Campbell, 2011). These results portray narcissistic grandiosity and vulnerability as situated in two distinct nomological networks, which traditionally has been taken as a primary source of evidence differentiating two constructs (Campbell & Fiske, 1959).

As another example, in one study using the NARQ, individuals high on narcissistic admiration were viewed as more assertive and popular during initial interactions with a small group (Leckelt, Küfner, Nestler, & Back, 2015); these findings are nearly identical to those which have emerged when narcissism was assessed with the NPI and its preponderance of items

capturing grandiose narcissism (e.g., Paulhus, 1998). However, in contrast, individuals high on narcissistic rivalry were seen as *less* assertive and popular in these early stage group interactions (Leckelt et al., 2015). Together, these results suggest that narcissistic grandiosity and vulnerability are differentially linked to status attainment and leadership in early-stage groups, adding a nuance to the field's knowledge of narcissism broadly speaking. Importantly, this finding would never have emerged if narcissism has been assessed with the NPI, given its overemphasis on the more adaptive aspects of grandiose narcissism.

1.3.4 Conclusion: Two gold stars

In sum, by tracing the historical progression of research on narcissism, one can see a particularly beneficial process of iteration through the measurement-theory cycle. Narcissism in the 1980s was one extremely heterogeneous construct operationalized primarily by one ostensibly unidimensional scale that in fact captured multiple constructs. Psychometric work uncovered the multidimensional nature of that scale, leading the field to re-conceptualize the construct as two-sided, and for individual researchers to create alternative tools meant to capture each distinct side of narcissism. The result is an emerging consensus that narcissistic grandiosity and vulnerability are two distinct constructs, and the subsequent accrual of evidence supporting their divergent correlates and consequences. Time will tell if this model continues to be accepted, as the field moves back into Stage 2 of the measurement-theory cycle, but for now the two-sided model has brought much clarity to a previously confusing content domain, and has been extremely generative in stimulating empirical progress.

1.4 Case 4: Depression

1.4.1 Stage 1: Planting a stake in the ground

When tracing the historical arc of measurement in the field of depression, two stakes in the ground clearly stand out: The Hamilton Depression Rating Scale (HDRS; Hamilton, 1960), a 17 item, clinician-rated instrument capturing the severity of a wide range of cognitive, affective, and physiological symptoms of depression, and the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), a 21-item, self-rated instrument primarily capturing the severity of cognitive and affective symptoms of depression. Both of these instruments were somewhat groundbreaking; the HDRS was created to help test the efficacy of first-generation antidepressant medications (Bagby, Ryder, Schuller, & Marschall, 2004), and the BDI represented a shift away from viewing depression as a largely psychodynamic condition to one involving observable symptoms on which patients themselves could report (Beck et al., 1961). Both of these instruments have also been extremely impactful; a recent review of nearly 10,000 articles from 1990-1999 in highly ranked journals found that the HRSD and BDI were used in 63% of all treatment outcome studies and 42% of all basic science studies, whereas no other single scale was used in more than 5% of studies (Santor, Gregus, & Welch, 2006). It wouldn't be a stretch to say that the field's current knowledge about depression is in large part tantamount to the field's current knowledge about the HRSD and the BDI.

1.4.2 Stage 2: Vetting the construct

In recent years, the HRSD and BDI both have been subject to critiques regarding their heterogeneity, as researchers have argued that these scales capture such a diverse range of symptoms that their sum-total scores are relatively meaningless in treatment or research contexts. In the case of the HRSD, a recent meta-analysis of factor-analytic studies found that a four-factor

solution best characterized the scale, though individual authors found data to support structures ranging from three to eight factors (Shafer, 2006). A review by Bagby and colleagues (2004) pointed out additional problematic features of the HRSD, including the fact that several individual items capture qualitatively different symptoms at progressively higher levels of severity. For example, the lowest level of severity for the guilt item is “self-reproach, feels he/she has let others down”, whereas higher severity levels involve statements such as “present illness is a punishment”, “hears accusatory or denunciatory voices and/or experiences”, and “experiences threatening visual hallucinations”; it is unclear, if not doubtful, that visual hallucinations are simply a more severe variant of self-reproach. Additionally, items are scaled such that they do not contribute equally to the patient’s total depression score; for example, whereas the guilt item has five levels of severity, several items (e.g., those capturing insomnia and somatic symptoms) have only three levels, meaning that they are weighted differently when computing a patient’s sum-total score (Bagby et al., 2004).

In the case of the BDI, evidence has also begun to support its considerable heterogeneity, though this inquiry has largely focused on a revised version (the BDI-II; Beck, Steer, and Brown 1996). Beck and colleagues (1996) found initial support for a two-factor solution of the BDI-II, in which symptoms divided along cognitive vs. somatic lines, and affective symptoms loaded on one of these two factors, depending on whether a student or clinical sample was used. Supporting this finding, a meta-analysis of factor-analytic studies of the BDI-II in the intervening years pointed to a two-factor solution as optimal (Huang & Chen, 2015). Finally, although Shafer’s (2006) meta-analysis concerned factor analytic studies of the original BDI (instead of the BDI-II), given the broad similarity between the two versions, it is worth pointing out that meta-

analytic evidence supported a three-factor solution, with authors finding evidence for anywhere from two to seven factors across individual studies.

Taken together, the field's collective structural analysis of the HRSD and BDI-II casts considerable doubt upon the notion that depression is a unitary phenomenon that can be adequately assessed with a sum-total score on either instrument. As a result of this considerable heterogeneity of the disorder, sum scores on the HRSD or BDI-II will yield noisy portraits of an individual's overall depression severity, and will not shed much light on the specific symptomatology that might drive a change in depression, or the psychological processes through which depression affects patient's functioning. In light of these issues, at least in the case of the HRSD, Bagby and colleagues (2004) were relatively direct in their prescribed course of action: "It is time to retire the Hamilton Depression Scale" (p. 2175).

1.4.3 Iteration back to stage 1

If depression is sufficiently heterogeneous to render sum-total scores on the HRSD and BDI-II inadequate, the logical next step in the measurement-theory cycle would be for researchers to develop alternative assessment tools that explicitly capture the various dimensions of depression. Such a development would mirror the process that has unfolded in the narcissism literature, whereby new measurement tools have recently been constructed to explicitly model the construct's clear multidimensional structure. Unfortunately, for a number of reasons, this development has for the most part not taken place in the case of depression. In the case of the HRSD, old habits may simply die hard; despite their advice to retire the scale, Bagby and colleagues (2004) noted that the field may show recalcitrance toward such a proposal, given the HRSD's monumental influence over 50 years of depression research. Indeed, this worry has proven prophetic, as the HRSD remains to this day the most widely used interview-based

measure of depression in research studies (DeRubeis, Strunk, & Lorenzo-Luaces, 2016; Nezu, Nezu, Lee, & Stern, 2014).

The case of the BDI-II is far more complicated. On one hand, researchers have shown willingness to revisit the structure of the BDI, and to consider alternative forms of assessment to the sum-total score. In the years since Beck and colleagues (1996) first proposed a two-factor solution, more than 10 additional factor analytic studies in the intervening years have found support for either two- or three-factor solutions as best characterizing the BDI-II, and authors of these studies have typically proposed the use of subscales to directly assess each factor in lieu of the sum-total score (e.g., Vanheule, Desmet, Groenvynck, Rosseel, & Fontaine, 2008).

Additional studies have pointed to the potential utility of subscales for understanding the consequences of depression. For example, one study found that a composite capturing somatic depression symptoms, compared to a composite capturing cognitive symptoms, more strongly predicted multiple risk factors for obesity and mortality (e.g., waist circumference; Marijnissen et al., 2011), and another study found that somatic symptoms were more predictive of cognitive symptoms when considering risk for heart disease and mortality (de Miranda-Azevedo et al., 2014). Furthermore, some work has shed light on the differential utility of cognitive and somatic symptoms in defining and diagnosing depression across different patient populations. For example, Ryder and colleagues' (2008) found that Chinese patients diagnosed with depression reported more somatic symptoms than did American patients, whereas American patients reported more cognitive symptoms than their Chinese counterparts (though this general pattern of results has not always replicated; Dere, Watters, Yu, Bagby, Ryder, & Harkness, 2015).

On the other hand, a countervailing wave of research has used factor analytic methods to support view that a unidimensional, sum-total BDI-II score is a useful tool for assessing

depression. The first to initiate this line of work was Ward (2006), who used six large data sets comprised of both student and outpatient samples to show that a bifactor model fit the BDI-II better than simple two-factor models than had been advocated in prior work. The bifactor model posits a general depression factor loading on all 21 BDI-II items, as well as two sub-factors representing cognitive and somatic symptoms, each of which loads only on a subset of BDI-II items; as a result, the specific cognitive and somatic items load on two separate factors, the general factor and one specific factor. The bifactor model was again established as a superior model than several competing two- and three-factor models in a study of adult outpatients by Quilty, Zhang, and Bagby (2010), as well as in large samples of Canadian and Chinese undergraduates in a study by Dere and colleagues (2015).

Establishing the bifactor model as superior to alternative two- and three-factor models is used as evidence that sum-total BDI-II scores are an adequate means of assessing depression. This is because, in a bifactor model, each symptom is understood to be influenced by a common source of variance representing overall depression severity (captured by the general factor), while a subset of cognitive and somatic symptoms are also influenced by one additional source of unique variance (captured by one of the subfactors) that is orthogonal to general depression (see Reise, 2012). The general depression factor typically accounts for the vast majority of variance in the depression symptoms; for example, in one large sample of outpatients, the general depression factor accounted for 75% of variance in BDI-II scores, whereas cognitive and somatic sub-factors accounted for only 3-16% of variance after controlling for the general factor (Brouwer, Meijer, & Zevalkink, 2013). Under this measurement model, any subscale comprised of only cognitive or somatic depression symptoms is hopelessly confounded with variance stemming from the general depression factor, thereby rendering them useless in predicting

outcomes of depression. Proponents of the bifactor model thereby consistently advocate for use of the sum-total BDI-II score in lieu of subscales (e.g., Brouwer et al., 2013; Quilty et al., 2010; Ward, 2006).

One recent research endeavor has sought to wed these two measurement approaches—the use of symptom-specific subscales and sum-total depression scores—into one comprehensive measurement technique. Watson and colleagues (2007) developed the Inventory of Depression and Anxiety Symptoms (IDAS), which includes five subscales, each of which corresponds to a symptom cluster for major depressive disorder found in the *DSM*. An additional subscale, labeled general dysphoria, is meant to capture a mix of typical depression symptoms, and in that sense is conceptually similar to a general factor of depression (Watson, O’Hara, Simms, et al., 2007). Importantly, both the five symptom-specific subscales and the general dysphoria scale have been shown to have clinical utility. The specific subscales show good discriminant validity with other symptom classes while maintaining high internal consistency, and self-reported symptom severity on each subscale shows strong convergent correlations with clinician-rated severity on that same symptom cluster. At the same time, the general dysphoria scale correlated strongly and positively with sum-scores on the BDI-II and clinician-rated scores on the HRSD, and general dysphoria scores were stronger predictors of major depression diagnosis among a sample of outpatients than were specific symptom subscales (Watson et al., 2007; Watson, O’Hara, Chmielewski, et al., 2008). These results together suggest that by assessing general dysphoria along with specific depressive symptom classes together, a clinician can paint the most comprehensive and useful portrait of a patient’s overall psychiatric condition.

When considering all of this evidence together, the field of depression is left in somewhat of a pickle: Researchers have on their hands a construct that appears to be heterogeneous and

multidimensional in nature, particularly as it is currently measured (Bagby et al., 2004; Huang & Chen, 2015; Vanheule et al., 2008), yet advanced modeling techniques are often used to buttress the notion that there may be a unidimensional core underlying this apparent multidimensionality (Brouwer et al., 2013; Quilty et al., 2010; Ward, 2006). Reflecting this potential unidimensional core, at present the modal measurement tactic in the field involves the use of sum-total scores on trusted measures such as the HRSD and BDI-II (DeRubeis et al., 2016; Nezu et al., 2014).

Furthermore, although Watson and colleagues' (2007; 2008) proposed measurement tactic shows promise in assuaging proponents of a sum-total score while still leaving room for researchers to examine the predictive and explanatory utility of symptom-specific subscales, their measure is susceptible to the same psychometric critique as have been levied at proponents of the BDI-II subscales: The general depression factor dominates and renders symptom-specific subscales virtually meaningless. A bifactor analysis of the IDAS showed that the general depression factor accounted for nearly 50 percent of the variance in depression scores on average, and that individual symptom-specific subscales each accounted for only 1 to 4 percent of additional variance (Simms, Grös, Watson, & O'Hara, 2008). The predominance of the general factor renders unlikely a scenario in which the field embraces a full-fledged reliance on subscales capturing specific depression symptoms.

1.4.4 Conclusion: Still unclear how to proceed

When viewed through the lens of the measurement-theory cycle, one optimistic interpretation of the trends outlined above is that the literature on depression has successfully iterated back through Stage 1, but instead of revising the way in which depression is measured by eschewing old hands such as the HRSD and BDI-II, researchers have drawn on state of the art statistical methods to reaffirm the usefulness of their traditional, modal measurement tactics.

Support for this view comes in part from the fact that attempts to pin down the exact structure of depression—that is, to precisely map its heterogeneity—have proven unsuccessful. As noted before, factor analytic studies have often advocated for different precise configurations in how the cognitive, affective, and somatic symptoms in the BDI-II should be modeled (Quilty et al, 2010). To further complicate matters, a recent high-profile article proposed that the BDI-II may even be best fit by modeling an additional arousal sub-factor in addition to the cognitive and somatic sub-factors (Bühler, Keller, & Läge, 2014). More broadly, meta-analytic evidence suggests researchers' attempts to search for subtypes of depression across various inventories (including but not limited to the HRSD and BDI-II) have primarily yielded inconsistent and contradicting evidence regarding which individuals symptoms cluster together within subtypes sharing a similar conceptual appearance (van Loo, de Jonge, Romeijn, Kessler, & Schoevers, 2012). In light the inability to pin down conclusive sub-factors or subtypes of depression, it is not surprising that many researchers would reaffirm the utility of simple sum-total depression scores in clinical assessment and research settings.

An alternative, more pessimistic view of the state of the literature is that the field has experienced a profound failure to iterate, in that the bifactor model has been used as a cloak of invincibility to shield the use of sum-total scores from a necessary and potentially useful eradication. The primary argument behind this view point is that sum-total scores simply do not make conceptual sense: Tools such as the HRSD and BDI-II (as well as the IADS) capture such a varied mix of symptoms that a researcher relying on sum-total scores is left with no hope of understanding why a patient experienced an improvement or relapse in his or her condition, or what component of depression is responsible for driving a specific empirical finding. In addition, the finding from a bifactor model that the general depression factor accounts for far more

variance than either cognitive or somatic subfactors is in part a statistical artefact stemming from the fact that the general factor loads on all 21 BDI-II items, whereas the specific subfactors load only on a subset of items (Brower et al., 2013); when specific subfactors load on a greater number of items, as in the IADS, they account for a greater total proportion of variance (Simms et al., 2008). More broadly, a recent qualitative analysis found that the items included in seven of the most widely used depression scales represented 52 distinct symptom clusters (Fried, in press); 40% of these symptoms appeared on only one scale, and only 12% of symptoms appeared on all seven scales. These analyses together imply that a literature built on sum-total scores across various depression instruments is a wild and unnavigable jungle, in that each sum-total score will have its own unique meaning, and effects found with different scales will not be comparable. As a result of this apparently intractable problem of heterogeneity in depression and its assessment tools, Monroe and Anderson (2015) recently predicted that the construct of depression will in the near future cease to have any utility for researchers and practitioners, and will become as obscure and niche a clinical syndrome as it was before the creation of the HRSD and BDI in the early 1960s. When it comes to depression, the only clear conclusion at present is that the field is still unclear on exactly how to define and measure the construct.

1.5 The present dissertation: The case of distinct emotions

The previous four examples were meant to illustrate the iterative, two-stage process through which measurement and theory are mutually and inextricably linked. I have reviewed four constructs—valuing happiness, shame and guilt, narcissism, and depression—which vary considerably in their historical prevalence (e.g., narcissism was introduced in 1898, valuing happiness in 2011), and which have been the subject of inquiry in fields as diverse as positive psychology, affective science, personality psychology, and clinical psychology. Yet, despite

superficial differences in the general arc of their trajectories, these four constructs have all proceeded through some form of the two-stage process linking measurement and theory. Each construct was initially defined and measured based on an often vague and nascent understanding of its conceptual structure, in a top-down, theory-driven Stage 1 process that emphasized content validity. This initial definition and measurement tactic was in turn evaluated by the broader research community, in a more data-driven Stage 2 process that emphasized convergent, discriminant, and predictive validity. Finally, based on this evaluation, researchers eventually worked in some way to revise the original definition and to develop new measurement tools which reflected the research community's updated understanding of the construct, thereby marking iteration back to Stage 1.

Of course, the four constructs also showed stark differences in the speed and efficacy with which researchers iterated back to Stage 1 following the field's initial pass through the two-stage process. For example, iteration was extremely effective in the case of narcissism, leading to a nuanced understanding that grandiose and vulnerable narcissism are distinct constructs with divergent implications for behavior. In contrast, iteration has been contentious in the depression literature, resulting in continued vigorous debate over whether to define and measure the construct as a uniform dimension, or using separate symptom groups. Contrasting even further with these two fields, the shame and guilt literature experienced a decade-long stasis characterized by a complete failure to iterate away from an initial, restrictive definition, in which shame was pigeonholed as a maladaptive emotion, and guilt lauded as an adaptive emotion. Finally, the valuing happiness literature saw iteration only after an initial narrow definition left a substantial mark on the academic and popular understanding of the construct, propagating the notion that valuing happiness in fact made people less happy. The upshot of all this is that the

trajectory of iteration back to Stage 1 regarding a given construct goes a long way toward shaping the long-term ability of that subfield to produce empirical research that furthers our understanding of human behavior. Fruitful iteration can therefore lead to theoretical progress, whereas delays or missteps in the iteration process can set a field back considerably.

With that broad point in mind, the goal of this dissertation is to analyze a different literature whose initial trip through the two-stage process in recent years has been somewhat unconventional; namely the literature on the subjective experience of distinct positive emotions. Distinct emotions are typically defined as including specific patterns of subjective feelings, physiological changes, neural activity, cognitive appraisals, and motivated action tendencies (Ekman, 1992; Kragel & LeBar, 2014; Roseman, 2011; Tracy & Randles, 2011). Although psychological inquiry into distinct emotions has historically focused primarily on negative emotions (and has included only one positive emotion, happiness; e.g., Ekman & Friesen, 1971), this trend began to shift around the turn of the century when Barbara Fredrickson published her influential Broaden-and-Build theory, which contended that positive emotions function to broaden typical ways of thinking and acting and to build personal and social resources (Fredrickson, 1998; 2001). Importantly, Fredrickson also advanced several hypotheses about how distinct positive emotions might play more specific functional roles in promoting adaptive behavior and well-being.

The Broaden-and-Build theory served as a jumping off point for what can be viewed as the initial pass through Stages 1 and 2 of the two-stage process linking measurement and theory, each of which have played out gradually over the past 10-15 years. Stage 1 has involved two somewhat distinct parts. First, many affective scientists have drawn on diverse literatures in psychology as well as other disciplines to advance theories about what exact components define

various distinct emotions; a list of these emotions includes but is not limited to admiration (e.g., Algoe & Haidt, 2009), amusement (e.g., Shiota et al., 2014), awe (e.g., Keltner & Haidt, 2003), compassion (e.g., Goetz, Keltner, & Simon-Thomas, 2010), elevation (Haidt, 2000), empathy (e.g., Wondra & Ellsworth, 2015; Zaki, 2014), enthusiasm (e.g., Shiota et al., 2014), gratitude (e.g., Algoe, 2012; McCullough, Emmons, Kilpatrick, & Larson, 2001), hope (e.g., Snyder, 2002), interest (e.g., Silvia, 2005), pride (e.g., Tracy & Robins, 2004), and three forms of love: attachment, nurturant, and romantic (e.g., Bersheid, 2010; Fehr, 2005; Shiota et al., 2014). The process by which researchers formulated theory-driven definitions of the subjective experience of distinct positive emotions is similar to the process by which researchers such as Iris Mauss and June Tangney proposed definitions of valuing happiness, shame, and guilt in the examples described above; in each case, researchers scoured the literature to find clues regarding the makeup of each construct, and used those clues to put forth a definition that could be codified in a measurement tool.³

The second part of Stage 1 is where the trajectory of the distinct positive emotion literature begins to diverge from the typical trajectory of Stage 1 described above. Whereas researchers such as Mauss and Tangney translated their definitions of valuing happiness, shame, and guilt into self-report measurement tools, researchers in the positive emotion literature have made almost no such efforts. In fact, to date, self-report scales exist for only five traditional basic emotions of anger, disgust, fear, happiness, and sadness (Harmon-Jones, Bastian, & Harmon-Jones, 2016), as well as anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), pride (Tracy & Robins, 2007), and shame and guilt (Marschall et al., 1994); of course, only two of these emotions—happiness and pride—are positive emotions. The lack of attention to scale

³ Pride is the one exception, as a more bottom-up approach was used to understand the content of this emotion as experienced by lay persons, and therefore complement the prior theoretical treatment; see Tracy & Robins, 2007.

development implies that the positive emotion literature has undergone a somewhat incomplete first pass through Stage 1 of the measurement-theory cycle; in particular, the typical goal of introducing a measurement tool reflecting the proposed definition of a given construct has not been realized. Given that the exact content of the measurement tools typically introduced during Stage 1 subsequently shapes the tenor of empirical findings regarding the construct that accumulate during Stage 2, one might wonder if the incomplete first pass through Stage 1 would have an adverse effect on positive emotion research conducted during Stage 2.

The short answer to this question is yes. In lieu of attention to self-report scale development, researchers interested in positive emotions have turned in large part to ad-hoc measures that consist of one word reflecting the emotion in question (e.g., one might measure awe by asking participants to endorse their feelings on the item “I feel awe”). Evidence for this comes from a recent review, in which my colleagues and I coded over half of the articles published in *Emotion* over the first 11 years of this journal’s existence (Weidman, Steckler, & Tracy, in press); for each of these articles, we identified every instance in which a momentary distinct emotion was measured with a self-report scale (i.e., a measurement instance; $n = 356$). We found that, in 77 percent of measurement instances, researchers measured distinct emotions with an *impromptu scale*, or one that was developed for a given measurement instance with no reference to prior research and without a systematic validation process. Furthermore, we found that a full 58 percent of measurement instances involved scales consisting of only a single item.

The modal tendency to assess distinct emotions with ad hoc scales consisting of a single item is problematic for two reasons. First, distinct emotions are prototype-like constructs, meaning that episodes of a given emotion may involve a somewhat variable set of features (i.e., thoughts, feelings, and action tendencies; e.g., Fehr & Russell, 1991; Hepper, Ritchie, Sedikides,

& Wildschut, 2012; Lambert, Graham, & Fincham, 2009; Russell, 1991b; Shaver, Schwartz, Kirson, & O'Connor, 1987). For example, one episode of fear may involve sweating, shakiness, and a trembling voice, whereas another episode may involve screaming, crying for help, and fleeing (Shaver et al., 1987). Considerable cross-cultural variability also exists in the manner in which various distinct emotions are defined (e.g., Heider, 1991; Hupka, Lenton, & Hutchison, 1999; Romney, Moore, & Rusch, 1997; Russell, 1991a). For example, although anger is viewed as a distinct feeling from sadness in the English language, several cultures in Africa and Southeast Asia have words for emotions that are blends of these two feelings (Russell, 1991a). The inherent fuzziness and complexity of distinct emotions means that empirical effects that emerge based on a single-item measure will be difficult to interpret, given that it will be nearly impossible to determine exactly which components or definition of the emotion participants have in mind when reporting their feelings in response to the single emotion word, particularly if those participants come from different sociocultural backgrounds.

Two examples—empathy and disgust—will help illustrate how distinct emotions can elude consensual definition due to their prototype-like structure, and therefore why single-item measures are sub-optimal to measure these states. In the case of empathy, some researchers define this state broadly as being comprised of three related but distinct components, including emotional sharing (i.e., feeling the same emotions as another person), empathic concern (i.e., showing care for another's plight), and perspective-taking (i.e., imaging what another person is going through; Decety & Cowell, 2014). Yet not all researchers agree on the components of empathy; for example, Zaki (2014) includes emotional sharing (represented in his definition by *experience sharing*), as well as perspective-taking (represented in his definition by *mentalizing* and *mind-perception*), but does not include empathic concern. Furthermore, several researchers

have proposed narrower definitions of empathy; for example, Wondra and Ellsworth (2015) argued that empathy involves only emotional sharing, namely “feeling what another person feels because something happened to them” (p. 411).

In the case of disgust, an early and influential definition, which drew on Darwin’s (1872) theory of disgust, is that disgust is primarily a physiological response that is elicited by potential environmental toxins, and functions to protect the self from pathogen exposure (e.g., Haidt et al., 1994). More recent formulations have identified multiple forms of disgust, however; these include pathogen disgust (i.e., a series of perceptual and physiological responses elicited by the presence or reminder of toxins) and moral disgust (i.e., a sense of outrage directed at behaviors that run contrary to accepted social or personal standards; Chapman & Anderson, 2013; Tybur, Lieberman, Kurzban, & DeScioli, 2013). The presence of multiple definitions of disgust is complicated in part by the fact that the word *disgust* is often taken to refer to emotional components better thought to capture anger (e.g., lashing out, getting back at someone) than disgust (e.g., throwing up, avoiding a pathogen; Nabi, 2002). This latter finding suggests that the word *disgust* may have a meaning more in line with moral than pathogen disgust.

A second problem stemming from the modal practice of measuring distinct positive emotions with ad-hoc, single-item measures stems from the tendency for the content of these measures to overlap between purportedly distinct emotions. Specifically, if multiple impromptu scales are used to measure a single distinct emotion across studies, each of these scales is unlikely to contain identical items; the use of impromptu scales is therefore likely to lead to the same distinct emotions being measured with different items across studies, and in turn for different distinct emotions to be measured with the same items across studies. Findings from the review described above support this contention. Of the 65 distinct emotions we identified as

being measured at least once, 51 (78%) were assessed with at least one word or phrase that was also used to measure another emotion in a separate study. Similarly, of the 125 single words used to measure distinct emotions across studies, 55 (44%) were used to measure more than one emotion; these 55 words were each used to measure an average of 2.67 emotions, across studies (Median = 2, SD = 1.06, Range: 2-6; Weidman et al., in press).

The problematic consequences resulting from the use of ad-hoc, single-item measures has not, however, hampered enthusiasm in the positive emotion research community for attempting to gain further theoretical insight into the nomological networks underlying these emotions, consistent with the goals of Stage 2. In recent years, empirical studies have explored the causes and consequences of distinct positive emotions such as admiration (e.g., Sweetman, Spears, Livingstone, & Manstead, 2013; van de Ven, Zeelenberg, & Pieters, 2011), awe (e.g., Piff, Dietze, Feinberg, Stancato, & Keltner, 2015; Valdesolo & Graham, 2014), compassion (e.g., Goetz, Keltner, & Simon-Thomas, 2010; Oveis, Horberg, & Keltner, 2010), empathy (e.g., Wondra & Ellsworth, 2015; Zaki, 2014), gratitude (e.g., Algoe, Fredrickson, & Gable, 2013; Bartlett & DeSteno, 2006), love (e.g., Chan, Tong, Tan, & Koh, 2013; Gonzaga, Turner, Keltner, Campos, & Altemus, 2006), pride (e.g., Tracy & Robins, 2007; Williams & DeSteno, 2008), schadenfreude (e.g., Greitemeyer, Osswald, & Brauer, 2010; van Dijk, van Koningsbruggen, Ouwerkerk, & Wesseling, 2011), and tenderness (e.g., Buckels, Beall, Hofer, Lin, Zhou, & Schaller, 2015; Lishner, Batson, & Huss, 2011). More broadly, a recent quantitative review observed that affective scientists have studied more than 30 distinct positive emotions over the past decade (Weidman et al., in press). This trend culminated in the 2014 publication of the *Handbook of Positive Emotions* (Tugade, Shiota, & Kirby, 2014), an authoritative volume that

included eight chapters dedicated to reviewing theoretical and empirical work on one distinct positive emotion each.

Of course, the frequent use of ad-hoc, single-item measures to assess distinct positive emotions implies that these states are typically measured in inconsistent, variable, and overlapping ways across studies, a problematic trend which resulted from the field's lack of attention to scale development during its first iteration through Stage 1 of the measurement-theory cycle. It is therefore hard to know exactly what distinct positive emotional state is being measured across the plethora of individual studies to date which have attempted to establish the convergent, discriminant, and predictive validity of individual positive emotions, in line with the agenda of Stage 2. This will over time make it extremely difficult to integrate the findings of the many individual studies conducted to date into a coherent body of knowledge about positive emotions. Taken together, this suggests that the field of subjectively experienced momentary distinct positive emotions has put the cart squarely in front of the horse—by seeking to vet individual emotions' ability to explain human behavior (Stage 2) before taking a complete first stab at both the definitional and measurement goals of Stage 1 in tandem—a development that will hamper theory development in the long run.

The work presented in this dissertation is meant to represent iteration back to Stage 1 for the field of positive emotions, in an effort to address the measurement-related goals that were not addressed along with the definition-related goals in the field's first pass through Stage 1. In Chapters 2 and 3, I will present research that represents a second trip through Stage 1 of the measurement-theory cycle in the context of two individual emotions, humility and happiness (specifically, the happiness people derive from discretionary spending). With respect to humility, the initial pass through Stage 1 involved defining and measuring humility as consisting of a

variety of socially desirable components, and Stage 2 involved showing that humility as so defined predicted a range of positive outcomes. With respect to happiness and discretionary spending, the initial pass through Stage 1 involved defining and measuring afterglow happiness (i.e., the happiness people feel when reflecting back on a purchase), and showing that spending money on life experiences brings people more afterglow happiness than does spending money on material things. As outlined in the two-stage process linking measurement and theory, iteration back to Stage 1 will involve a reformulation of each construct. In the case of humility, I will suggest that it in fact consists of two distinct dimensions, one of which (appreciative humility) mirrors the original definition, whereas the other (self-abasing humility) consists of an entirely different set of subjective components and sits at the center of an entirely different nomological network. In the case of happiness and discretionary spending, I will suggest that happiness can come in multiple forms, and that material things may fare better in comparison with life experiences when considering momentary happiness (i.e., the happiness people feel while consuming a purchase) instead of afterglow happiness.

In Chapter 4, I will expand my scope of inquiry, and present research that represents iteration back to Stage 1 for each positive emotion typically studied in the literature. As noted above, although theory-based definitions have been formulated for many positive emotions, accompanying measurement tools have not yet been constructed for the majority of subjectively experienced distinct positive emotions, therefore leaving the field without comprehensive, reliable tools to assess these states. Along these lines, I will present work involving the constructions of self-report measures for each positive emotion. In contrast to the typical top-down progression of Stage 1, however, the content of these scales will be based on a bottom-up analysis of lay person's actual subjective experiences of each emotion; this change in approach

will help ensure that the resultant measures capture a more comprehensive and distinctive picture of each positive emotion than is yielded by ad-hoc, single-item measures currently used in the field, or than could be yielded by relying on one research team's understanding of a given emotion. In work emblematic of Stage 2, I will then present a network-analysis of the interrelations between all of these emotions, based on the new measurement tools described above.

Finally, in Chapter 5, I will reflect on lessons that can be gleaned from analyzing a diverse set of empirical literatures through the lens of the two-stage measurement-theory cycle. More specific to my own research, I will outline an agenda for the field of distinct positive emotions, which involves building off of the work presented in Chapter 4 to learn more about the higher-order structure of distinct positive emotions, as well as expanding the field's knowledge about the non-subjective components that characterize these states (i.e., facial expressions, physiological reactions), and the cross-cultural structure of these states' subjective experience. I will conclude by describing how this holistic future research agenda could move the field toward a consensual and overarching taxonomy of universal, basic positive emotions.

Chapter 2: The psychological structure of humility

Psychological inquiry into the construct of humility has advanced considerably over the past decade. At the turn of the century, humility was largely neglected by the psychological sciences, with few empirical articles even broaching the subject (Tangney, 2000). More recently however, the topic has gained prominence within the positive psychology movement, as researchers conceptualized it as a character strength that could promote human flourishing (Peterson & Seligman, 2004), and humility has been identified as a core component of one of the major dimensions in the HEXACO model of personality (Ashton & Lee, 2007). Over the past few years numerous empirical studies examining the causes and consequences of humility have appeared in the field's top journals (e.g., Davis, Worthington, Jr., Hook, Emmons, Hill, Bollinger, & Van Tongeren, 2013; Kesebir, 2014; Kruse, Chancellor, Ruberton, & Lyubomirsky, 2014; Tong, Tan, Chor, Koh, Lee, & Tan, 2016), leading several researchers to suggest that the study of humility has “turned a corner” (Chancellor & Lyubomirsky, 2013, p. 819), and appears en route to becoming one of social-personality psychology's hot topics.

Taking all of this together, it appears that the literature on humility has gone through a first iteration of the two-stage measurement-theory cycle. In contrast to the literatures reviewed in Chapter 1—in which one or two research teams were primarily responsible for the first iteration through Stage 1—the initial definition and measurement of humility has been more of a collective endeavor. Several theorists have, over the past two decades, offered preliminary definitions of humility, suggesting that the construct variously involves having an accurate self-view, lacking any egotism or desire to boast about one's achievements and talents, and appreciating other people's personal qualities (e.g., Chancellor & Lyubomirsky, 2013; Davis et al., 2010; Peterson & Seligman, 2004; Tangney, 2000). Building on these definitions, several

different research teams have engaged in scale construction efforts following rational-theoretical procedures (Simms, 2008), which have led to the proliferation of approximately 13 self-report measures that have been used across studies to assess humility (Davis & Hook, 2014). A recent systematic review suggests that the content of these instruments fit nicely into seven distinct content clusters, including items capturing other-oriented and unselfish behavior, openness or lack of superiority, interpersonal modesty, accurate view of self, willing to admit mistakes and being teachable, regulation of need for status, and spirituality or existentiality humility (Davis & Hook, 2014). One unifying theme among the content of these existing measures is that the components thought to comprise humility are all socially desirable in nature, reflecting existing theoretical conceptualizations which label the construct as a “virtue” or “character strength” (e.g., Chancellor & Lyubomirsky, 2013; Davis et al., 2010; Peterson & Seligman, 2004; Tangney, 2000).

During Stage 2 of the measurement-theory cycle, the coherence between these socially desirable theoretical accounts and the correspondent measurement tools has produced a body of literature that, not surprisingly, portrays humility in an extremely positive light. Studies have shown, for example, that humility can: (a) buffer against death anxiety by reducing egoism (Kesebir, 2014), (b) reinforce feelings of gratitude (Kruse et al., 2014), (c) strengthen relationships by promoting forgiveness in close bonds and likeability in new acquaintanceships (Davis et al., 2013), (d) promote a range of prosocial behaviors such as helping and charitable giving (Exline & Hill, 2012; LaBouff et al., 2012), (e) protect against everyday stressors and promote psychological and physical health and well-being (Jankowski, Sandage, & Hill, 2013; Krause, 2010; Krause, 2014; Krause, Pargament, Hill, & Ironson, 2016), and (f) facilitate self-control (Tong et al., 2016).

Chapter 2 of this dissertation is meant to represent humility's first step in the iteration back through Stage 1 of the measurement-theory cycle. Iterating back through Stage 1 is important in the case of humility because the convergent, discriminant, and predictive validity evidence accumulated to date appears to portray an overly narrow, one-sided view of the construct. Specifically, there are several reasons to suggest that existing socially desirable definitions and measurement tools for humility are incomplete, and that humility make also involve a darker, less socially desirable side. First, as noted by several theorists, dictionary definitions refer to humility as involving a low opinion of oneself and displaying meekness (Tangney, 2000), and the word humility has roots in the Latin word *humilitatem*, meaning lowness, small stature, and insignificance (Online Etymology Dictionary, 2015). Second, in the disciplines of theology and philosophy where humility has been a focal topic of inquiry for centuries, numerous theorists have proposed that humility includes a sense of self-abasement. In the Early Common Era and Middle Ages, religious scholars conceptualized humility as adopting a low opinion of oneself, correspondent with frequent and demonstrative self-abasement before a greater, divine power (Isiah: 66:2; Matthew: 23:12; see also Aquinas, 1265; de Clairveaux, 1120; Ignatius, 1548); later classical philosophical accounts followed suit (Hume, 1739). More recently, contemporary philosophers have highlighted an important role of self-deprecation, low self-worth, and submissive behavior (e.g., Richards, 1988; Tucker, 2015). Tucker (2015) presents a particularly intriguing account, arguing that humility has two distinct sides, one involving submissive and passive behavior—a conceptualization that aligns closely with dictionary and etymological accounts, as well as prior theological accounts—and a second involving dedication and commitment to valued principles.

Third, turning to psychological evidence, lay persons seem to conceptualize humility as involving a darker side. In one survey of individuals' perceptions of humble people, although many of the qualities participants listed were prosocial in nature (e.g., kind/caring toward others, not boastful, unselfish/sacrificing), many listed qualities were oriented toward avoidance, such as *timid*, *unassertive*, and *prone to shame and embarrassment* (Exline & Geyer, 2004). Similarly, in one prototype analysis of behavioral modesty—a characteristic closely aligned with humility—participants categorized their descriptions of a modest person into prosocial, affiliative groupings (e.g., solicitous, not boastful, likeable, gracious) and groupings of words more associated with avoidance and a negative self-view (e.g., shy, insecure, and embarrassed by praise; Gregg, Hart, Sedikides, & Kumashiro, 2008).

The potential existence of a darker, self-abasing side to humility points to the need to revise the manner in which humility is measured. If humility indeed includes two distinct psychological sides, then the existing scales—which operationalize it with uniformly positive items—are necessarily overly restrictive, in that they do not capture the more self-abasing side of humility. Additionally, some studies measure humility using only a single word (e.g., “humble”, “humility”, or “humbleness”; e.g., Kesebir, 2014). If humility includes two distinct psychological sides, the use of a single word to measure humility is likely also inadequate, in that it will be unclear which components of humility participants have in mind when responding to this item. A useful analogy comes from research on pride, an emotion that involves two relatively distinct psychological experiences: (a) authentic pride, or a genuine feeling of accomplishment, self-worth, and satisfaction following a personal achievement; and (b) hubristic pride, or an inflated sense of arrogance, egotism, and snobbishness resulting from a deluded self-view (Tracy & Robins, 2007). Although the word “pride” is itself somewhat more closely

associated with authentic than hubristic pride, at least in Western cultures, the word sits at the fulcrum of these two feelings (Tracy & Robins, 2007); as a result, assessing pride with the single word “proud” would at best capture an indeterminate blend of authentic and hubristic pride, and at worst would preferentially capture authentic pride at the expense of hubristic pride. A similar outcome would result if the word “humility” is used to capture humility, to the extent that the construct consists of two psychological sides.

Given that existing measurement tactics do not directly capture humility’s self-abasing side, no studies to date would have been able to determine the nomological network within which this second side of humility lies, and in turn what its causes, correlates, and consequences are in everyday life. In Chapter 2, we conducted five studies with the goal of providing a comprehensive, bottom-up analysis of the psychological structure of humility. In doing so, we sought to test whether humility is comprised of a self-abasing side in addition to a more positive other-appreciative side. We predicted that each dimension of humility would involve distinct antecedent events, cognitions, and action tendencies. Specifically, we predicted that appreciative humility would generally occur in response to appraisals of success or accomplishment, involve positive self-evaluations, and elicit action tendencies linked to celebrating others and their accomplishments. In contrast, we predicted that self-abasing humility would occur in response to appraisals of failure, involve negative self-evaluations resulting from the recognition of others’ superiority, and elicit action tendencies linked to hiding from others’ evaluations.

As an initial test of these hypotheses, in Study 1 we collected a large list of humility-related words and tested whether participants’ ratings of the similarity among these words indicate two distinct semantic-based groupings, consistent with the theoretical distinction between appreciative and self-abasing humility. If humility indeed consists of two distinct

dimensions, then lay conceptualizations should include two distinct semantic clusters, with content mapping onto the theoretical distinction.

In Studies 2 and 3 we tested whether the subjective feelings that occur during actual experiences of humility consist of two distinct dimensions, by asking participants to rate their tendency to experience of each of a comprehensive set of humility-related words, both as a momentary response to a single humility-eliciting event (Study 2), and as a chronic dispositional tendency (Study 3). In these studies, we also more closely examined the link between each form of humility and the self-evaluative cognitions, distinct emotions, and other-oriented action tendencies that we expected to distinguish between them. In Study 2, this involved content-coding participants' open-ended narratives for the on-line self-evaluative thoughts and other-oriented action tendencies that occur during a humility experience. In Study 3, this involved measuring associations between humility and relevant emotional and personality dispositions.

Next, in Study 4 we examined whether the psychological structure of humility uncovered in Studies 1-3 using words generated by lay persons would replicate when examining content generated by academic experts in the study of humility outside the realm of psychology. Philosophers and theologians were asked to generate humility-related words and phrases, and naïve judges sorted these words and phrases into categories. Finally, in Study 5 we tested whether we could separately induce experiences of the two humility dimensions, and whether experimentally manipulating these dimensions would result in distinct emotional episodes and behavioral action tendencies.

In sum, by providing the first systematic investigation of the psychological structure of both semantic conceptualizations and subjective experiences of humility, and delineating its profile of eliciting events, self-evaluative thoughts, distinct emotional feelings, and other-

oriented action tendencies, the current research marks a critical advance in the empirical study of humility.

2.1 Study 1

Study 1 examined the conceptual structure of humility by exploring how individuals think about its semantic domain. Do individuals conceptualize humility as consisting of two dimensions, and, if so, does the content of these dimensions map onto the theoretical distinction between an appreciative and a more self-abasing humility? To address this question, we began by generating a comprehensive set of humility-related words and then asking participants to rate the semantic similarity of these terms. We then examined whether these words form two distinct clusters, representing different forms of humility.

2.1.1 Method

2.1.1.1 Participants

One-hundred, forty undergraduate students (78% women) enrolled in psychology courses at the University of British Columbia participated for course credit.

2.1.1.2 Humility words

Humility-related words were drawn from a Pilot Study involving a separate set of undergraduate participants ($n = 87$; 71% women) who were asked to generate, in an open-ended fashion, words that describe their humility experiences. Specifically, participants were instructed to, “Think about the emotion of humility and how you feel when you experience this emotion. Please write down a list of words or phrases that reflect what you think, feel, and do when you feel humility. These words or phrases could be characteristic of the thoughts in your head, the behaviors you show, or the way you feel emotionally and physically.”

Participants in the pilot study collectively generated 308 distinct words and phrases; Figure 1 depicts a word cloud for this list, with more frequently listed words appearing larger. For the purposes of obtaining semantic similarity ratings of these words, we trimmed the list to include only those words that were mentioned by at least 4 participants (5% of the sample); this allowed us to omit highly idiosyncratic responses and reduce the number of similarity ratings that participants in the main study were required to perform. This yielded a list of 34 frequently mentioned words. We then eliminated eight more words that clearly reflected broad positive and negative valence states but had little additional substantive content (e.g., “happy”, “good”). This iterative process resulted in a final list of 26 words that were retained for inclusion in the study (see Figure 2). To create word pairs for semantic similarity ratings, each of the 26 humility-related words were paired with each other, resulting in 325 pairs of humility-related words.

2.1.1.3 Procedure

Participants were instructed to “rate the following pairs of words or phrases according to how similar in meaning you think they are to each other,” on a scale ranging from 1 (“Not at all similar”) to 5 (“Extremely similar”). To prevent fatigue, the total pool of 325 word pairs was split into two subsets and each participant rated the similarity of word pairs in one of the subsets, containing either 162 ($n = 65$ participants) or 163 ($n = 76$ participants) word pairs.

2.1.2 Results

To test whether participants’ semantic similarity ratings would reveal two distinct clusters of humility words, we first aggregated similarity ratings for each word pair across all participants [$ICC(1, 1) = .98$]. We then analyzed these aggregated ratings with hierarchical cluster analysis using the Ward’s linkage method based on squared Euclidian distances, across all mean similarity ratings. Hierarchical clustering begins with every word treated as a cluster

unto itself, and, at each successive step, similar clusters are merged until all words are merged into a single cluster. The number of clusters that defines the content domain is typically determined by examining the agglomeration coefficients at each stage of clustering. In the present data, a large change in coefficient size—indicating a marked increase in the squared Euclidean distance between successive steps of clustering—occurred in the last step of the clustering schedule (i.e., Step 25), where two clusters were merged into a single cluster solution (the coefficients at steps 22 to 25 were 188.31, 228.74, 293.45, and 483.96, respectively). This pattern of coefficients suggests that, consistent with our expectations, humility-related words are semantically organized into two clusters.

To determine whether the content of these two clusters corresponds to the theoretical distinction between appreciative and self-abasing humility, we examined the words within each cluster, as displayed in the dendrogram—a tree diagram that visually depicts the hierarchical composition of each cluster (see Figure 2). The 18 words that fell in the first cluster appear to capture a tendency to recognize the worth and importance of others, hold respect for others, and seek social connection (e.g., “respectful”, “equal”, “understanding”, “connected”, “compassionate”). Several of these words overlap with adjectives previously found to capture the trait of agreeableness (Goldberg, 1990; 1992). Several of these words also appear to reflect a sense of self-appreciation (e.g., “accomplished”, “confident”, and “proud”), and overlap with items known to capture authentic pride (Tracy & Robins, 2007). In contrast, the words that fell in the second cluster appear to capture feelings of self-abasement and self-devaluation (e.g., “embarrassed”, “meek”, “sad”, “self-conscious”, “shy”, “small”, “stupid”); these words overlap with low extraversion and high neuroticism (Goldberg, 1990; 1992), as well as low self-esteem (Rosenberg, 1965) and shame (Tangney & Dearing, 2002).

In summary, the results of Study 1 suggest that individuals conceptualize humility as comprised of two distinct semantic clusters, one related to the appreciation of others and a desire to be agreeable, and the other involving signs of self-abasement, low self-esteem and shame, and a desire to withdraw from social situations. These results challenge prior psychological conceptualizations of humility that have been uniformly positive, emphasizing only accurate self-assessment and other-appreciation (e.g., Chancellor & Lyubomirsky, 2013; Davis et al., 2010; Peterson & Seligman, 2004; Tangney, 2000). It is also noteworthy that the words associated with each form of humility contain a mixture of self-evaluative thoughts, distinct-emotional feelings, and other-oriented action tendencies, which we might expect to see in an emotion plot (Ekman, 1992; Oatley & Johnson-Laird, 1987). Nevertheless, because these findings are based on individuals' beliefs about humility, which might arise from cultural ideas or intuitions about the concept of humility (Haslam, Bain, & Neal, 2004), it remains unclear whether the subjective experience of humility is also characterized by a two-dimensional structure involving appreciation and self-abasement. We tested this question in Studies 2 and 3.

2.2 Study 2

In Study 2 we examined whether the two humility clusters found in Study 1 would replicate in participants' ratings of their momentary humility experiences. Humility was induced via the Relived Emotion Task (RET; Ekman, Levenson, & Friesen, 1983), in which participants wrote about a humility-eliciting event; the RET has been shown in past research to elicit both subjective and physiological reactions associated with the emotion being recalled (e.g., Ekman et al., 1983; Levenson, Carstensen, Friesen, & Ekman, 1991). Participants then rated the extent to which each of a set of humility-related words characterized their feelings during the experience. These ratings were analyzed using exploratory factor analysis (EFA) to determine whether the

structure of momentary humility feelings is characterized by two dimensions that map on to the theoretical distinction between appreciative vs. self-abasing humility.

In Study 2 we also examined whether the two-factor structure of humility would emerge above and beyond distinctions between positive and negative valence, and socially desirable and undesirable feelings. According to Barrett and Russell (1998), the bipolar dimension of evaluative valence (from positive to negative feelings) underlies the lexicon of all mood and affect terms. Similarly, prior work suggests that social desirability—independent of substantive content—is the primary source of variance in individuals' emotion ratings (Pettersson & Turkheimer, 2013). It is therefore possible that humility has two dimensions in part because it includes both positive/socially desirable and negative/socially undesirable elements, and, when thinking about a humility experience, people naturally make a distinction between its positive/desirable and negative/undesirable aspects. If this is the case, then in some sense the two-cluster structure that emerged in Study 1 is an artifact of people's tendency to distinguish between positive/desirable and negative/undesirable states, and not reflective of a more substantive distinction between two ways of experiencing humility. In Study 2, we directly addressed this question by testing whether the two proposed dimensions of humility would emerge when variance attributable to evaluative valence and social desirability was statically removed.

Study 2 also allowed us to test whether the two forms of humility involve distinct correlates. To test this hypothesis, we content-coded participants' narrative descriptions of their humility experiences for the kinds of events that elicited the experience and for momentary self-evaluations and action tendencies associated with the experience, and examined whether these aligned with the two-factor account. Prior work suggests that humility can be preceded by both

success and failure, but has not examined any differences in the form of humility that follows each type of event (Exline & Geyer, 2004). We therefore predicted that appreciative humility would most often be elicited by events relating to success or achievement, whereas self-abasing humility would most often be elicited by events relating to failure or defeat. We in turn predicted that appreciative humility would be associated with positive self-evaluations (e.g., viewing oneself as an achiever) and action tendencies toward celebrating or recognizing others' accomplishments (e.g., expressing gratitude, seeking social connection), whereas self-abasing humility would be associated with negative self-perceptions arising from a negative social-comparison (e.g., viewing oneself as ignorant) and action tendencies oriented toward hiding from others and avoiding their negative evaluations (e.g., social withdrawal; isolation).

2.2.1 Method

2.2.1.1 Participants

Six hundred forty-eight participants (74% women) enrolled in psychology courses at the University of British Columbia completed a questionnaire for course credit. These participants were split into two samples (Sample 1: $n = 267$; Sample 2: $n = 381$), for whom the procedure was identical, except where noted below.

2.2.1.2 Procedure and measures

To capture humility experiences, participants in each sample were instructed to “think about a time when you felt humility...describe the events that led up to your feeling this way, in as much detail as you can remember.” Participants in Sample 2 were also given the following, additional instructions: “Please note that humility does NOT mean the same thing as ‘humiliation’, or public embarrassment or shame”. After providing open-ended narrative responses, all participants rated the extent to which each of 54 humility-related words described

their feelings during the event, on a scale ranging from 1 (“Not at all”) to 5 (“Extremely”). This set of words was taken from the same set of humility-related words generated for Study 1.

However, to include a larger, more comprehensive set of words, in the present study we included the top most frequently mentioned 54 items—every word listed by at least 3 participants (4% of the sample; see Table 1).

To measure evaluative valence, participants rated the extent to which four of the words on Barrett and Russell’s (1998) positive and negative mood measure (i.e., “happy”, “content”, “pleased, “unhappy”) characterized their humility experience, on a scale ranging from 1 (“Not at all”) to 5 (“Extremely”).⁴ The one negative mood item was reverse-scored, and the four items were averaged to form an evaluative valence composite ($\alpha = .89$).

To rate social desirability of humility words, a separate sample of both undergraduates ($n = 40$; 75% women) and Amazon Mechanical Turk (MTurk) workers ($n = 49$; 47% women; 71% European-American; M age = 36.39; $SD = 10.07$) completed an online survey for class credit or monetary compensation, respectively. Participants from each sample were asked to rate “how desirable it would be for a person to experience” each of the 54 humility related words, on a scale of 1 (“not at all desirable”) to 5 (“very desirable”). Raters from both samples showed good consensus ($ICC(2, k) = .82$ and $.87$ for UBC and MTurk samples, respectively). Ratings of each word from the two samples were correlated $.98$; we therefore averaged the two ratings for each word to create a social desirability score for each word.

To code for antecedents of humility, for narratives written by participants in Sample 1, four advanced undergraduate research assistants, blind to the goals of the study and participants’ ratings of their feeling states, rated the extent to which each narrative described an event

⁴ The two other negative mood items on Barrett and Russell’s (1998) scale (“miserable”, “troubled”), were omitted due to experimenter error.

involving: (a) a success or achievement, and (b) a failure or defeat. Both items were rated on a scale ranging from 1 (“Not at all this type of event”) to 5 (“Very much this type of event”). Inter-rater reliabilities for the two items were .92 and .89, respectively.

To code for cognitions and action tendencies, for narratives written by participants in Sample 1, the same four coders rated each participant’s humility narrative for the extent to which it explicitly described a set of self-evaluative cognitions and other-oriented action tendencies that might follow success or failure.⁵ Self-perceptions were rated on a -2 (“Much lower than others”) to 2 (“Much higher than others”) scale, with a mid-point of 0 (“Equal to others”), and items related to celebrating vs. hiding from others were rated on a 1 (“Not at all”) to 5 (“Very much”) scale. The coders reached satisfactory levels of agreement on the following self-perceptions: “developed insights into positive aspects of the self” ($\alpha = .58$) and “negative aspects of the self” ($\alpha = .73$), as well as “perceived oneself as more intelligent” ($\alpha = .80$), “achieving” ($\alpha = .86$), “moral” ($\alpha = .70$), “important and significant” ($\alpha = .66$), “powerful and in control” ($\alpha = .65$), and “ignorant and unwise” ($\alpha = .62$), compared to others. Adequate levels of agreement were also reached on the following action tendencies and behaviors: “expressed gratitude or appreciation” (inter-rater $\alpha = .62$), “sought social connection with others” ($\alpha = .61$), “helped others” ($\alpha = .81$), “wanted to hide” ($\alpha = .60$), and “wanted to be alone” ($\alpha = .70$).

To index these same self-perceptions and action tendencies via self-report, Sample 2 participants, after writing about their humility experience, indicated how they felt about themselves after the event in comparison to others, using the same scale as above, on the dimensions of “intelligence”, “achievement”, “morality”, “importance and significance”, “power and control”, and “ignorance”. These participants also completed single-item measures assessing

⁵ Prior to coding, a senior research assistant, trained in coding procedures, was asked to read all 268 narratives and identify any that contained insufficient information to be coded; this resulted in the exclusion of 61 narratives, leaving 205 that were coded. Two additional narratives also were not coded due to coder error.

their desire to express gratitude, seek interpersonal connection, help others, and be alone, on the same scale as above.

2.2.2 Results and discussion

2.2.2.1 Humility dimensions

To test whether state experiences of humility are characterized by a two-dimensional structure, we conducted exploratory factor analysis using maximum likelihood extraction and oblimin rotation on participants' ratings of their humility-related feelings.⁶ Consistent with expectations, observation of a scree plot indicated that a two-factor solution was appropriate; eigenvalues for the first seven factors were 16.46, 6.45, 3.06, 2.07, 1.60, 1.26, and 1.19, and the first two factors accounted for 42% of variance. The two factors correlated weakly, $r = -.17$, suggesting that they are largely independent dimensions. Additionally, Tucker's congruence coefficient for the pattern of loadings between Samples 1 and 2 was .98, suggesting a nearly identical loading pattern across samples (Lorenzo-Seva & ten Berge, 2006).

The content of the words that loaded onto each factor fit with the distinction between appreciative and self-abasing humility (see Table 1). Specifically, 17 of the 18 words from the appreciative cluster in Study 1 had their highest loading on the first factor here (the only exception was "unpretentious").⁷ All 8 of the 8 words from the self-abasement cluster in Study 1 had their highest loading on the second factor here. The remainder of items that loaded highly on the appreciative factor appear related to attending to others (e.g., "generous", "considerate", "graceful") or generalized positive affect (e.g., "good", "smiling"; "happy"). The remainder of

⁶ All EFA results reported here were based on oblimin rotation. However, all results replicated when varimax rotation was used instead. Given our theoretical perspective that the two dimensions are part of a broader content domain (i.e., of humility) and might therefore be correlated, we report results based on oblimin rotation.

⁷ Given that unpretentious is a reverse-coded item in the present context (i.e., it negates a feeling that is conceptually opposite to other-appreciation), it may contain variance due to its form, rather than content. Variance due to item form will not be shared with the straightforward items capturing other-appreciation, which could lead to this item's low factor loading.

items that loaded highly on the self-abasement factor appear to be related to self-devaluation (e.g., “unimportant”, “submissive”) or generalized negative affect (e.g., “sad”, “unhappy”).

Interestingly, the words “humble” and “modest”—which are the two words that in lay conceptions might be considered to best capture a generalized form of humility—loaded only weakly on the first factor (appreciative humility; $\lambda_s = .39$ and $.30$, respectively) and near-zero on the second factor (self-abasing humility; $\lambda_s = .07$ and $-.15$, respectively). Furthermore, when we conducted an analysis extracting only one factor, this general humility factor was characterized by strong, positive loadings for appreciative humility items and strong, negative loadings for self-abasing humility items. “Humble” and “modest” again showed relatively weak, positive loadings on this single factor ($\lambda_s = .34$ and $.24$, respectively). Although we might expect these two items to load strongly on a general humility factor, the finding that these loadings were weak to moderate is consistent with a two-dimensional account. If humility indeed involves two distinct experiences, then core items that capture both components should not be particularly strong markers of either dimension, and as a result should not load strongly on a general factor—which is, essentially, a forced bipolar representation of the two-dimensional construct (i.e., the general factor yields strong, positive loadings for purely appreciative humility items, and strong negative loadings for purely self-abasing humility items). That said, these two words are clearly perceived by participants as corresponding more strongly with appreciative humility than self-abasing humility, given their substantially stronger loadings on the former rather than the latter factor; this may partly explain why prior studies which have most often manipulated or measured humility using the single word “humble” have typically argued for a singular conceptualization largely aligned with what we refer to as appreciative humility.

To provide a formal test of the optimal factor solution, we conducted parallel analysis and the minimum average partial method (Zwick & Velicer, 1986). Parallel analysis compares the eigenvalue for each factor in one's own data to the corresponding eigenvalues generated by many data sets of the same size but comprised of entirely random variables (i.e., random noise data), and recommends that factors be extracted until the eigenvalue for one's own data falls below the 95th percentile of eigenvalues from the random noise data. The minimum average partial method computes the average squared partial correlation among all variables in one's data set, following the extraction of each subsequent factor; when the average partial correlation reaches a minimum, it signifies that no meaningful variance remains in the data, and no further factors are extracted.

This method suggested that a five-factor solution best characterized state experiences of humility. However, in each of the three, four, and five-factor solutions, two factors consistently emerged that appeared nearly identical to the appreciative and self-abasing factors that had emerged in the two-factor solution. Factor scores for the appreciative humility factor in the two-factor solution correlated .93-.99 with the corresponding appreciative humility factors in the 3, 4, and 5-factor solutions, and factor scores for the self-abasing humility factor in the two-factor solution correlated .92-1.00 with the corresponding self-abasing humility factors in the 3, 4, and 5-factor solutions. These results broadly suggest that the core content of appreciative and self-abasing humility is relatively impervious to our decision of which factor solution to retain.

Nonetheless, we further examined the five-factor solution to determine whether humility might be best understood as also involving three additional dimensions, beyond the two we had identified. In the five-factor solution, the appreciative and self-abasing humility factors continued to be characterized by content related to appreciating others ("considerate", "kind",

“generous”, and “understanding”) and devaluing the self (e.g., “shameful”, “worthless”, “unimportant”, and “stupid”), respectively. The other three factors represented: (1) a blend of happiness and pride (e.g., “happy”, “satisfied”, “accomplished”, “proud”), (2) introversion (e.g., “quiet”, “reserved”, “meek”), and (3) feelings of self-consciousness (e.g., “embarrassed”, “anxious”, “blushing”). Although these findings point to the plausibility of a five-factor model of humility, we believe that the two-factor model provides a more parsimonious account of the data. In our view, the other three factors are best understood as sub-components of appreciative or self-abasing humility. However, researchers interested in an even more nuanced understanding of humility may wish to bear in mind the subtle distinctions among these sub-factors. Importantly, at least two of these sub-factors (introversion and self-consciousness) are inconsistent with the current predominant account of humility in the literature as a wholly pro-social, positive experience, suggesting that, regardless of which factor solution is adopted, humility cannot be considered a singular, socially desirable or purely virtuous state.

2.2.2.2 Evaluative valence

In light of the finding that both the appreciative and self-abasing humility factors appeared to include some content primarily reflecting evaluative valence, we examined whether the same two-factor structure of humility emerged when evaluative valence was statistically removed. Specifically, we regressed participants’ ratings of each humility-related word onto their ratings of the evaluative valence composite, and saved the standardized residuals for each word. These residual scores capture variability in the propensity to experience each humility-related feeling after the variance predicted by pleasant affect has been statistically removed.

We next conducted an EFA on these residualized items. A scree plot again indicated that a two-factor solution was viable; eigenvalues for the first seven factors were 9.75, 4.46, 3.37,

2.61, 2.03, 1.58, and 1.43, respectively, and the first two factors accounted for 31% of variance. Tucker's congruence coefficient between the original and valence-free loadings was .77, however, indicating some meaningful differences in the loading patterns. Examining the loading plots confirmed this observation; the first and second factors again represented appreciative and self-abasing humility, yet items representing primarily evaluative valence (e.g., "good", "happy" for appreciative humility; "unhappy" and "sad" for self-abasing humility) each had much smaller loadings on their respective factors in the valence-free solutions (see Table 1). Furthermore, the words defining the appreciative humility factor bore an even stronger resemblance to those previously identified as markers of agreeableness (Goldberg, 1990; 1992), and the words defining the self-abasing humility factor now aligned more closely to those representing shame, low self-esteem, introversion, and neuroticism (Goldberg, 1990; 1992; Rosenberg, 1965; Tangney & Dearing, 2002).⁸ It would seem, therefore, that these valence-free appreciative and self-abasing humility factors capture more substantive versions of the original factors, purified of content driven by evaluative valence. It follows that these factors, along with the original ones, should be used to inform the best understanding of the content of humility.

2.2.2.3 Social desirability

To provide an additional test of the robustness of the two-factor structure, we examined whether it would emerge when controlling for the social desirability of each item. Following

⁸ Of note, as in the original factor solution, the words "humble" and "modest" showed weak, positive loadings on valence-free appreciative humility ($\lambda_s = .34$ and $.25$, respectively), and weak loadings on valence-free self-abasing humility ($\lambda_s = .10$ and $.17$, respectively), though these latter loadings were higher than those found in the original factor solution. In the one-factor solution, the general humility factor again seemed to capture appreciative humility, and "humble" and "modest" again showed weak, positive loadings ($\lambda_s = .35$ and $.26$, respectively). Additionally, parallel analysis and the minimum average partial method again suggested that five factors optimally characterized the valence-free solution. However, the 3, 4, and 5-factor solutions again each produced a factor with content nearly identical to the appreciative and self-abasing factors in the 2-factor solution ($r_s = .86-1.00$; $M = .95$). In the five-factor solution, the appreciative and self-abasing humility factors again contained content related to attending to others and self-devaluation, respectively, and the other three factors again captured happiness and pride, introversion, and self-consciousness.

Pettersson, Turkheimer, Horn, and Menatti (2012; see also Asparouhov & Muthén, 2009), we conducted Exploratory Structural Equation Modeling (ESEM) using the lavaan package in R. In this procedure, one social desirability factor is defined with the loading for each humility word fixed by its corresponding social desirability rating, and the two subsequently extracted humility factors are forced to be orthogonal to this desirability factor. We first identified the social desirability factor by computing its factor loadings. Specifically, following Pettersson and colleagues (2012), we calculated factor loadings for each humility related word as a function of the interrelationships between the original items and each item's social desirability. We used the following formula to arrive at these loadings:

$$r*b = s$$

In this formula, r is the original correlation matrix of all 54 humility related words, b is a matrix of the mean-centered social desirability ratings for each humility word, and s is a resulting matrix of factor loadings for each humility word on the social desirability factor. Once we had identified the social desirability factor, we subsequently extracted two exploratory factors, onto which each of the 54 humility related words were allowed to load freely. To satisfy the minimum number of constraints needed to identify the model, factor variances were also fixed to 1, and factor intercorrelations were fixed to zero. Additionally, one word was selected as a marker variable for each humility factor; we chose the word that had the lowest absolute value loading on the *other* humility factor; this item was constrained to load only on the humility factor for which it was a marker, and to have a cross-loading of zero on the other humility factor (see Ferrando & Lorenzo-Seva, 2000, and Jöreskog, 1969, for more detail). For example, in our original factor analyses “submissive” had a loading of .00 on the appreciative humility factor and “understanding” had a loading of .00 on the self-abasing humility factor. The loadings of these

two items were therefore fixed to zero on the appreciative and self-abasing factors, respectively, but loaded freely on the self-abasing and appreciative humility factors, respectively.⁹

We next examined the pattern of loadings on the two exploratory factors, once the social desirability factor had been defined. Of note, the mean social desirability ratings for each item correlated .80 with the mean self-report of each item in response to a humility event, suggesting that social desirability is the primary dimension along which individuals complete self-report emotion ratings (see Pettersson & Turkheimer, 2013, for a similar result). Additionally, these strong correlations suggest that little substantive variance remains in the humility ratings and the exploratory factors they define once they are forced to be orthogonal to the social desirability factor. It is therefore questionable to interpret the exact magnitude of factor loadings produced by the humility ratings themselves after social desirability variance has been statistically removed, as they are likely to be extremely unstable from sample to sample.

Nevertheless, an examination of the pattern of loadings on the two exploratory humility factors suggested that they appeared to take the form of appreciative and self-abasing humility (see Table S1). Tucker's congruence coefficient between the original and desirability-free pattern of loadings was .85, indicating relative similarity between the two sets of loadings. In addition, the highest-loading items on each factor appeared to capture the core content of appreciative and self-abasing humility. The top 10 highest loading items on the appreciative humility factor all captured the core themes of agreeableness and prosociality (e.g., "compassionate", "kind", "empathic"), and the top 10 highest loading items on the self-abasing humility factor all captured

⁹There are multiple ways to satisfy the criterion needed to identify a model when conducting ESEM. One of these involves fixing loadings in an echelon pattern (McDonald, 1999); however, this pattern is arbitrary and therefore lacks a theoretical basis (E. Pettersson, Personal Communication, February 24, 2016; Ferrando & Lorenzo-Seva, 2000). For the sake of completeness, however, we did re-run our ESEM analyses while fixing loadings in an echelon pattern (after running the analyses reported in text); not surprisingly, given the arbitrary nature of this technique, the resultant pattern of loadings made less conceptual sense in terms of our two-factor model, and are therefore not discussed further.

the core themes of neuroticism, introversion, shame, and low self-esteem (e.g., “embarrassed”, “anxious”, “worthless”). These results suggest that the core themes of appreciative and self-abasing humility emerge in a two-factor solution even after these factors are forced to be orthogonal to a factor defined by social desirability.

2.2.2.4 Antecedent events

To examine whether the two humility dimensions are associated with distinct types of eliciting events (i.e., success vs. failure), we next classified each event described in the narratives as either a success or a failure, based on which of these two coded dimensions received a higher mean rating. This led to the categorization of 72% of humility narratives as primarily about success, and 28% as primarily about failure. This difference suggests that when asked to write about a time when they felt humility, undergraduates are more likely to think about events related to success than events related to failure, consistent with prior research (Exline & Geyer, 2004).

We next compared the factor scores on each humility dimension for participants whose narratives were classified as success versus those whose narratives were classified as failure. Appreciative humility factor scores were higher for narratives involving success ($M = .13$, $SD = 1.05$) than failure ($M = -.31$, $SD = .98$), $t(182) = 2.60$, $p < .05$, $d = .43$; in contrast, self-abasing humility factor scores were higher for failure narratives ($M = .61$, $SD = 1.09$) compared to success ($M = -.18$, $SD = .86$), $t(182) = 5.24$, $p < .001$, $d = .80$. Correlations between the factor scores and our coders' ratings of the extent to which each narrative described a success versus a failure corroborated these results; events that led to greater appreciative humility were more likely to involve success ($r = .20$, $p < .01$) and less likely to involve failure ($r = -.26$, $p < .001$),

whereas events that led to greater self-abasing humility were more likely to involve failure ($r = .40, p < .001$) and less likely to involve success ($r = -.39, p < .001$).

2.2.2.5 Action tendencies

We next examined differences in self-evaluative cognitions and action tendencies between the two forms of humility by correlating factor scores on the two humility dimensions with coded ratings of participants' self-perceptions during each narrated experience (see Table 2). We also computed partial correlations controlling for evaluative valence, and present both sets of correlations in Table 2. Below we focus our discussion on the partial correlations, as these better indicate the substantive association between each form of humility and self-evaluations and action tendencies, not driven by differences in evaluative valence; however, we urge some caution in interpreting the exact magnitude of these correlations, given the strong correlations between valence (i.e., pleasantness) and both appreciative humility ($r = .68$) and self-abasing humility ($r = -.76$).

Consistent with the finding that appreciative humility arises more frequently following success and is comprised of feelings related to agreeableness and a tendency toward prosociality and appreciation of others, individuals who experienced appreciative humility tended to express gratitude and thanks toward others, seek interpersonal connections, and want to help others. This suggests that the core feelings of appreciative humility—independent of its overlap with evaluative valence—lead people to seek affiliation with others.

In contrast, consistent with the finding that self-abasing humility arises more frequently following failure and is comprised of feelings linked to shame and low self-esteem, individuals who reported high levels of self-abasing humility tended to view themselves as less intelligent, achieving, moral, important and significant, and powerful and in control compared to others, and

also as *more* ignorant and unwise than others. Also as predicted, these individuals reported a stronger desire to be alone. At the same time, however, self-abasing humility (controlling for evaluative valence) was positively linked to a desire to express gratitude and thanks, seek connection with others, and to want to help others, all of which are somewhat antithetical to a desire to be alone. These later results raise the possibility that self-abasing humility involves a desire to connect with others; however, these effects emerged as significant only in the partial correlations controlling for evaluative valence, indicating a possible suppressor effect that merits replication in future work. All together, these findings suggest that self-abasing humility leads people to adopt a negative self-view and withdrawal orientation, along with a concurrent desire to overcome it.

In summary, the results of Study 2 corroborate those of Study 1 to suggest that subjective experiences of humility are comprised of two distinct dimensions, which correspond to the theoretical distinction between appreciative and self-abasing humility. The content of appreciative humility again appeared to overlap with that of agreeableness, whereas the content of self-abasing humility appeared to capture a mix neuroticism, introversion, shame, and low self-esteem. Importantly, the two-dimensional structure of humility emerged even when individuals were explicitly told that humility does not mean the same thing as humiliation; this suggests that the emergence of a second, self-abasing side of humility is not due to any linguistic confusion over the meaning of the word.

Study 2 also provided initial evidence that each form of humility follows distinct kinds of events, and involves distinct self-evaluative cognitions and other-oriented action tendencies. Appreciative humility tends to follow successes and leads to action tendencies meant to celebrate or acknowledge others; contrary to our initial predictions, however, appreciative humility was

not strongly related to positive self-insights (particularly when evaluative valence was controlled for), suggesting that it is primarily associated with a focus on others more than an increased self-awareness. In contrast, self-abasing humility tends to follow personal failures, is associated with more negative self-insights, and leads to action tendencies oriented toward avoiding others, though it may also lead to an apparently conflicting desire to connect with others.

2.3 Study 3

In Study 3, we examined whether the two clusters of humility words found in Study 1 and the two factors based on momentary humility experiences found in Study 2 would replicate in participants' ratings of their dispositional tendency to experience each of a large set of humility-related feeling states. Specifically, we asked participants to rate their tendency to experience these states, then factor analyzed their ratings to determine whether the structure of dispositional humility feelings is characterized by two factors consistent with the results of Studies 1 and 2. In Study 3, we also again examined whether the two-factor structure of humility would emerge when controlling for evaluative valence (Barrett & Russell, 1998) and social desirability (Pettersson & Turkheimer, 2013).

Study 3 also examined links between each form of humility and emotional and personality dispositions associated with self-evaluation. If appreciative and self-abasing humility follow personal successes and failures, respectively, and lead to action tendencies oriented toward celebrating or hiding from others, respectively, then we would expect the emotional dispositions associated with dispositional humility to reflect these cognitions and action tendencies. More specifically, we expected, first, that appreciative humility but not self-abasing humility would be positively linked to dispositional authentic pride, an emotion that occurs in response to achievement and signifies genuine satisfaction with the self and a sense of

confidence (Tracy & Robins, 2007; Weidman, Tracy, & Elliot, in press). We also examined associations with hubristic pride—the more arrogant and self-aggrandizing form of pride—but we did not have strong predictions about the direction of these relations. On one hand, the feelings of inferiority and insecurity inherent to self-abasing humility seem somewhat antithetical to feelings of grandiosity, which would lead us to predict a negative association between self-abasing humility and hubristic pride. On the other hand, if those feelings of inferiority lead individuals to experience hubristic pride as a defense mechanism, as has been suggested regarding the previously observed positive association between shame and hubristic pride (Tracy, Cheng, Martens, & Robins, 2011; Tracy, Cheng, Robins, & Trzesniewski, 2009; Pincus & Roche, 2011), then we might expect self-abasing humility to be positively related to hubristic pride.

Second, we expected appreciative humility to be linked to guilt-proneness, and self-abasing humility to be linked to shame-proneness and embarrassability. Following an accomplishment, an individual experiencing appreciative humility may appraise others' similar accomplishments and related skills as more worthwhile than her own; she may therefore feel guilty for the positive recognition that she has received, and wish to draw more attention to the other individual, consistent with the other-orientation involved in guilt (Tangney & Dearing, 2002). In contrast, following a perceived failure an individual may appraise herself as lacking a worthwhile skill or attribute, resulting in feelings of shame or embarrassment (Tangney, Miller, Flicker, & Barlow, 1996; Tangney & Dearing, 2002).

Third, consistent with the expectation that appreciative humility arises when people appraise their abilities and attributes in a positive light—but that the opposite is true for self-abasing humility—we expected positive correlations between appreciative humility and self-

esteem, but negative correlations between self-abasing humility and self-esteem. In contrast, we predicted that neither form of humility would show a strong association with grandiose narcissism. Regarding appreciative humility, one might expect a positive association given our finding that appreciative humility is associated with a positive self-view, a central component of narcissism (Bosson & Weaver, 2011); however, one might also expect a negative association, given that one of the core theoretical components of this form of humility is modesty and a willingness to perceive oneself in a realistic and non-aggrandizing manner, as well a propensity toward agreeableness, both of which are at odds with narcissism (Ackerman, Witt, Donnellan, Trzesniewski, Robins, & Kashy, 2011). We had similarly equivocal predictions regarding the relation between self-abasing humility and grandiose narcissism; on the one hand, narcissists are characterized by self-perceptions that should be negatively related to self-abasing humility, such as grandiosity and authoritativeness (Ackerman et al., 2011); on the other hand, as noted above, there is evidence that narcissists harbor implicit feelings of inferiority and worthlessness (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003; Tracy et al., 2011). On the whole, given that modesty and realistic self-appraisals have typically been central to conceptualizations of humility (e.g., Peterson & Seligman, 2004; Tangney, 2000), we expected to see negative or null relations between both humility dimensions and narcissism once variance due to self-favorability (i.e., self-esteem) was statistically removed (see Paulhus, Robins, Trzesniewski, & Tracy, 2004).

Fourth, we predicted that appreciative humility would be positively correlated with prestige-based status and communion. This expectation is consistent with evolutionary accounts proposing that individuals who seek status based on prestige should broadcast their achievements by displaying competence, pride, *and* humility (Cheng, Tracy, & Henrich, 2010; Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013; Henrich & Gil-White, 2001). Though displays of pride

and humility may appear contradictory, by signaling both high status and an acknowledgement of one's limitations, expressions of humility may counterbalance the potentially threatening demeanor associated with pride displays, and serve to maintain the social attractiveness of the prestigious individual. The ultimate evolved function of prestige is thought to involve cultural learning; prestigious individuals are granted status because they are highly knowledgeable or skilled social models, who attract social learners who, in turn, defer to them, in exchange for the opportunity to learn from them (Henrich & Gil-White, 2001). Displaying humility and thereby offsetting any appearance of arrogance from pride displays may allow these individuals to attract more learners and followers. However, to maintain the appearance of success and avoid being misperceived as unskilled or unaccomplished, the form of humility expressed by prestigious individuals should be of the appreciative variety; displaying self-abasing humility might risk eliciting perceptions of incompetence. In contrast, we expected self-abasing humility to be shown by relatively less prestigious others, and to therefore be negatively correlated with concepts of high status including prestige, agency, and subjective power, and positively correlated with submissive behavior.

Fifth, to better situate humility within the predominant taxonomy of individual differences in personality, we examined correlations between humility and the Big Five traits. In line with the finding from Study 2 that appreciative humility involves other-oriented action tendencies, as well as prior work showing that many of the words found in Study 2 to describe appreciative humility experiences are also used to describe agreeable individuals (e.g., Goldberg, 1990; 1992), we predicted that appreciative humility would be strongly and positively linked to agreeableness. In contrast, in line with the finding from Study 2 that self-abasing humility involves action tendencies aimed at withdrawing from others and negative self-evaluations, as

well as prior work showing that some of the words found in Study 2 to describe self-abasing humility experiences are also used to describe introverted individuals (Goldberg, 1990; 1992), we predicted that self-abasing humility would be strongly and negatively linked to extraversion and positively to neuroticism. We did not have strong predictions for relations between humility and the other two Big Five traits.

Finally, consistent with prior work suggesting that humility and modesty share many features (Chancellor & Lyubomirsky, 2013; Davis et al., 2010; Peterson & Seligman, 2004; Tangney, 2000), we predicted that both appreciative and self-abasing humility would be positively related to the behaviors lay people attribute to modest individuals (Gregg et al., 2008). This prediction follows from Gregg and colleagues' (2008) prototype analysis of behavioral modesty, which revealed traces of both appreciation and self-abasement, even though these authors concluded that modesty was a predominantly positive, socially desirable trait.

2.3.1 Method

2.3.1.1 Participants

Four hundred, sixty-two participants completed this study. Sample 1 was comprised of 192 undergraduate students (74% women) enrolled in psychology courses at the University of British Columbia who participated for course credit. Sample 2 was comprised of 270 adults recruited online via MTurk (65% female; 72% European American, 5% Latino, 4% East Asian, 4% African-American, 4% Native American, 15% other; M age = 32.78; SD = 12.37; Range = 18-67) living in the U.S., ranging in age from 12 to 67 years (M = 32.61, SD = 12.26). An additional 32 participants were recruited for Sample 2, but were excluded based on failing at attention check item included in our survey. Procedures for the two samples were identical except where noted.

2.3.1.2 Measures

To measure humility experience, participants rated the extent to which they “generally feel this way” for 54 humility-related words, on a scale ranging from 1 (“Not at all”) to 5 (“Extremely”).

To measure evaluative valence, participants rated the extent to which they “generally feel this way” for each of the six words on Barrett and Russell’s (1998) positive and negative mood measure, on a scale ranging from 1 (“Not at all”) to 5 (“Extremely”; $\alpha = .89$).

Pride was assessed using the trait version of the 14-item Authentic and Hubristic Pride Scales (Tracy & Robins, 2007; α s = .88 and .84, respectively). Participants in Sample 1 also completed the Test of Self-Conscious Affect (TOSCA-3; Tangney, Dearing, Wagner, & Gramzow, 2000) shame-proneness ($\alpha = .82$) and guilt-proneness ($\alpha = .83$) subscales. Following Tangney (1995), shared variance between the two variables was statistically removed to provide a measure of guilt-free shame and shame-free guilt, by retaining the standardized residuals from a regression equation predicting shame from guilt, and vice-versa. Sample 1 participants also reported embarrassability, using the 26-item Embarrassability Scale (Modigliani, 1966; $\alpha = .90$).

Self-esteem was assessed with the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965; $\alpha = .88$), and narcissism with the 40-item Narcissistic Personality Inventory (Raskin & Terry, 1988; $\alpha = .86$). In Sample 1, agency and communion were each assessed with 8 items selected from the Revised Interpersonal Adjective Scales (Wiggins, Trapnell, & Phillips, 1988), subjective power was assessed with the 8-item Sense of Power Scale (Anderson, John, & Keltner, 2012; $\alpha = .87$), and prestige was assessed with the 9-item subscale from the Dominance-Prestige Scales (Cheng et al., 2010; $\alpha = .81$). Submissiveness was assessed with the 12-item Adolescent Submissive Behavior Scale (Irons & Gilbert, 2005; $\alpha = .85$), an abbreviated measure

of the lengthier adult version containing the same core items designed to assess submissiveness in potential conflict situations. Social acceptance was assessed with the 9-item Inclusionary Status Scale (Spivey, 1990; $\alpha = .81$). Participants in Sample 1 also completed the 44-item Big Five Inventory (John, Naumann, & Soto, 2008, 1999), which assesses the Big Five Factors of Extraversion ($\alpha = .84$), Agreeableness ($\alpha = .72$), Conscientiousness ($\alpha = .75$), Neuroticism ($\alpha = .84$), and Openness to Experience ($\alpha = .74$).

Finally, participants reported their proneness to modesty by rating the extent to which they “generally feel this way” for each of the 23 words identified by Gregg and colleagues (2008) as prototypical descriptions of a modest person, on the same scale used to assess humility-related feelings ($\alpha = .76$).

2.3.2 Results and discussion

2.3.2.1 Humility dimensions

As in Study 2, to test whether trait experiences of humility are characterized by a two-dimensional structure, we conducted EFA using maximum likelihood extraction and oblimin rotation on participants’ ratings of their tendency to feel each of the humility words. Consistent with expectations, a scree plot indicated that a two-factor solution was appropriate; eigenvalues for the first six factors were 14.47, 6.56, 2.71, 2.47, 1.69, 1.35, and 1.33, and the first two factors accounted for 39% of variance. The two factors again correlated weakly, $r = -.15$, suggesting that they are largely independent dimensions. Tucker’s congruence coefficient for the pattern of loadings between Samples 1 and 2 was .89, again suggesting a highly similar loading pattern (Lorenzo-Seva & ten Berge, 2006).

As in Study 2, the content of the words that loaded onto each factor again fit with the theoretical distinction between appreciative and self-abasing humility (see Table 1). Specifically,

17 of the 18 words from the appreciative cluster in Study 1 had their highest loading on the first factor here (the only exception was again “unpretentious”), and all 8 words from the self-abasement cluster in Study 1 had their highest loading on the second factor here. Also as in Study 2, the remainder of items that loaded highly on the appreciative factor were related to attending to others or generalized positive affect, and the remainder of items that loaded highly on the self-abasement factor were related to self-devaluation or generalized negative affect.

In contrast to Study 2, the words “humble” and “modest” loaded moderately to strongly on the appreciative humility factor ($\lambda_s = .58$ and $.43$, respectively), and again near-zero on the self-abasing humility factor ($\lambda_s = .04$ and $.15$, respectively). The slightly higher loadings for these items on the appreciative factor, compared to what was observed in Study 2, may suggest that when considered at a trait level, these items are seen as aligning more strongly with that form of humility rather than the self-abasing one. Additionally, as in Study 2, when only one factor was extracted, the resulting general humility factor was characterized primarily by positive loadings for appreciative humility items, and negative loadings for self-abasing humility items. The words “humble” and “modest” showed positive loadings on this factor ($\lambda_s = .39$ and $.23$, respectively), though the magnitude of these loadings was somewhat lower than on the appreciative humility factor that emerged from the two-factor extraction.

To provide a more formal test of the optimal factor solution, we again used parallel analysis and the minimum average partial method (Zwick & Velicer, 1986). Each of these methods suggested that a five-factor solution best characterized state experiences of humility. However, as in Study 2, in the three, four, and five-factor solutions, two primary factors emerged that appeared nearly identical to the appreciative and self-abasing humility factors that had emerged in the two-factor solution. Factor scores for the appreciative humility factor in the two-

factor solution correlated .91-.93 with the corresponding appreciative humility factors in the 3, 4, and 5-factor solutions, and factor scores for the self-abasing humility factor in the two-factor solution correlated .82-.88 with the corresponding self-abasing humility factors in the 3, 4, and 5-factor solutions. These results suggest that the core content of appreciative and self-abasing humility is relatively impervious to our decision of which factor solution to retain.

In the five-factor solution, as in the two-factor solution, the appreciative humility factor again contained items reflecting attention to others (e.g., “considerate”, “kind”, “compassionate”, “generous”), and the self-abasing factor contained items reflecting self-devaluation (e.g., “embarrassed”, “ashamed”, “blushing”, “meek”); the other three factors represented: (1) pride (e.g., “confident”, “accomplished”, “self-worthy”), (2) introversion (e.g., “quiet”, “reserved”, “shy”), and (3) unpleasant affect (e.g., “unhappy”, “sad”, “happy” [negative loading]). As in Study 2, although these findings point to the plausibility of a five-factor model of humility, we believe that the two-factor model provides a more parsimonious account of the data, as the other three factors can be understood as sub-components of appreciative or self-abasing humility. This is especially likely to be the case given that the additional three factors that emerged here are not identical to those that emerged in Study 2, suggesting that the most robust results (i.e., those that replicated across studies and methods) point to a simpler, two-factor structure.

Finally, to examine whether the appreciative and self-abasing humility factors replicated across Studies 2 and 3, we computed Tucker’s congruence coefficient between the profile of factor loadings obtained in each study. This coefficient was .97, attesting to the robustness of these factors across both state and trait-based experiences, and both student and adult samples.

2.3.2.2 Evaluative valence

As in Study 2, given that both the appreciative and self-abasing humility factors appeared to include content reflecting evaluative valence, we examined whether the same two-factor structure would emerge when evaluative valence was statistically removed. We again conducted an EFA on the 54 residualized humility items, after evaluative valence had been partialled out, by regressing each humility word onto pleasant affect, and saving the standardized residuals. A scree plot again indicated that a two-factor solution was viable; eigenvalues for the first seven factors were 8.73, 4.48, 3.20, 2.54, 1.95, 1.59, and 1.50, respectively, and the first two factors accounted for 24% of variance. Tucker's congruence coefficient between the original and valence-free loadings was .76, again indicating some meaningful differences in the loading patterns. As in Study 2, examining the loading plots confirmed this observation; the first and second factors clearly represented appreciative and self-abasing humility, yet the items representing primarily evaluative valence each had much smaller loadings on their respective factors in the valence-free solutions (see Table 1). Also as in Study 2, the valence-free appreciative humility factor included words very similar to those previously used to mark agreeableness (Goldberg, 1990; 1992), and the self-abasing humility factor included words linked to shame, low self-esteem, introversion, and neuroticism (Goldberg, 1990; 1992; Tangen & Dearing, 2002).¹⁰ As was the case in Study 2, then, the valence-free appreciative and self-

¹⁰ Similarly to the original factor solution, the words "humble" and "modest" again showed moderate, positive loadings on appreciative humility ($\lambda_s = .54$ and $.44$, respectively), though these loadings were higher than those seen in Study 2. The items also again showed weak loadings on self-abasing humility ($\lambda_s = .18$), though these latter loadings were higher than those found in the original factor solution. In the one-factor solution, the general humility factor again seemed to capture appreciative humility, and "humble" and "modest" showed moderate, positive loadings ($\lambda_s = .54$ and $.45$, respectively), though again these loadings were higher than those in Study 2. Additionally, as in Study 2, parallel analysis and the minimum average partial method again suggested that five factors optimally characterized the valence-free solution. However, the 3, 4, and 5-factor solutions again each produced a factor with content nearly identical to the appreciative and self-abasing factors in the 2-factor solution ($r_s = .70$ - 1.00 ; $M = .90$). In the five-factor solution, the appreciative and self-abasing humility factors again contained

abasing humility factors appear to represent more substantive versions of the original factors, purified of the strong influence of evaluative valence.

2.3.2.3 Social desirability

To provide an additional test of the robustness of the two-factor structure, we again examined whether this structure would emerge when the social desirability of each item was controlled for, by conducting ESEM. As in Study 2, we defined one social desirability factor with the loading for each humility word fixed by its corresponding social desirability rating—taken from the same social desirability scores that were used in Study 2—and with two subsequently extracted humility factors forced to be orthogonal to this desirability factor.

We examined the pattern of loadings on the two exploratory factors once the social desirability factor had been defined. Of note, the mean social desirability ratings for each item correlated .86 with the mean self-reported trait level of each item. This again suggests that social desirability is the primary dimension along which individuals complete self-report emotion ratings (see Pettersson & Turkheimer, 2013, for a similar result), and that little substantive variance remains in the humility ratings and the exploratory factors they define once they are forced to be orthogonal to the social desirability factor, making it questionable to interpret the exact magnitude of factor loadings produced by the humility ratings in this analysis themselves.

Nevertheless, when we examined the pattern of loadings on the two exploratory humility factors, they appeared to take the form of appreciative and self-abasing humility (see Table S1). Tucker's congruence coefficient between the original and desirability-free pattern of loadings was .62, however, indicating some discrepancy between the two sets of loadings. Still, the highest-loading items on each factor appeared to capture the core content of appreciative and

content related to attending to others and self-devaluation, respectively, and the other three factors captured pride, introversion, and low self-esteem (e.g., “worthless”, “stupid”, “unimportant”).

self-abasing humility. Of the top 10 highest loading items on the appreciative humility factor, seven appeared to capture the core themes of agreeableness and prosociality (e.g., “considerate”, “kind”, “understanding”). The remaining three top loading words were “humble,” “human”, and “unhappy”. Of the top 10 highest-loading items on the self-abasing humility factor, eight appeared to capture the core themes of neuroticism, introversion, shame, and low self-esteem (e.g., “unimportant”, “ashamed”, “small”); the other two top-loading items were “sad” and “unhappy”.¹¹ Taken together, these results suggest that the core themes of appreciative and self-abasing humility emerge, for the most part, in a two-factor solution even after these factors are forced to be orthogonal to a factor defined by social desirability.

2.3.2.4 Emotion and personality profiles

We next examined the relations between factor scores from the two humility factors and theoretically related emotional dispositions and personality traits. As in Study 2 we present bivariate correlations as well as partial correlations controlling for evaluative valence (see Table 3); once again, we view the partial correlations as the best indication of the substantive associations between each form of humility and the corresponding emotional and personality dispositions, given that these relations are not overly influenced by shared variance in evaluation. We therefore focus our discussion below on these effects. That said, however, as in Study 2 the

¹¹ The finding that “unhappy” was among the highest-loading items on a factor defined by appreciative humility items *and* on a factor defined by self-abasing humility items likely speaks to the instability of these analyses; there may be almost no meaningful variance left in ratings of “unhappy” once it is forced to be orthogonal from social desirability, and the factor loadings for “unhappy” on the substantive humility factors may be determined primarily by error variance (see Pettersson & Turkheimer, 2013, for a similar result). This explanation is corroborated by the fact that “unhappy” had the second lowest social desirability rating of all 54 humility related words (1.27 on a 5-point scale), suggesting it may be more or less tantamount to social undesirability. It is also worth noting that the highest-loading items on the appreciative humility factor only loaded in the .20-.30 range, even though the majority of them captured the central themes of appreciative humility. This is likely due to the fact that several words that appear at a conceptual level to capture negative valence or self-abasing humility (i.e., “unhappy”, “unimportant”, “sad”), were among the highest-loading items on the appreciative humility factor. Given that these words are typically unrelated—if not antithetical—to the core appreciative humility items (e.g., “considerate”, “kind”, “understanding”), the factor appears to contain somewhat mixed content, which likely precluded any word from showing strong primary loadings.

exact magnitude of these partial correlations should be interpreted with caution, given the high correlations between pleasantness and both appreciative humility ($r = .57$) and self-abasing humility ($r = -.81$).

The two humility factors showed divergent relations with proneness to pride, shame, and guilt. First, as predicted, appreciative humility was positively associated with authentic pride, whereas self-abasing humility was not associated with authentic pride, and neither form of humility was linked to hubristic pride. Second, individuals prone to appreciative humility tended to experience the adaptive, other-oriented emotion of guilt more strongly than those prone to self-abasing humility, whereas self-abasing humility was more strongly linked to the more maladaptive negative self-conscious emotion of shame. In contrast to our predictions, however, both forms of humility were positively linked to embarrassability. This result may be due to the fact that the embarrassability scale asks participants to report on their feelings in situations that require empathizing with others, a tendency that may be linked to appreciative humility (e.g., “Suppose you were in a class and you noticed that the teacher had completely neglected to zip his fly”; “Suppose you were a dinner guest, and the guest seated next to you spilled his plate on his lap while trying to cut the meat”), and also feelings of self-consciousness, a tendency more linked to self-abasing humility (e.g., “Suppose you tripped and fell while entering a bus full of people”; “Suppose you were alone in an elevator with a professor who had just given you a bad grade”; Modigliani, 1968).

Turning to self-esteem and narcissism, because these traits operate consistently as mutual suppressors (Paulhus et al., 2004), we examined the partial correlations between each form of self-favorability and humility after controlling for the other form of self-favorability (e.g., we examined the partial correlation between self-esteem and humility while controlling for

narcissism; self-esteem and narcissism were strongly correlated $r = .47$). Using this procedure, the correlations between both dimensions of humility and narcissism, as well as the correlation between self-esteem and appreciative humility, were small in magnitude and not significant; however, the correlation between self-abasing humility and self-esteem was moderate and negative. Taken together, these findings suggest that appreciative humility is linked to an emotional profile associated with achievement and other-orientation, whereas self-abasing humility is linked to an emotional profile associated with withdrawal and low self-worth.

Next, we found that individuals prone to appreciative humility reported greater prestige-based status and communion, consistent with our theoretical account of appreciative humility as typically occurring following a success, and involving a recognition of others' value and worth without lowering one's own sense of self or status (Cheng et al., 2010; Henrich & Gil-White, 2001). A similar pattern of results was obtained for agency and subjective power, though these relations were weakened to non-significance when controlling for evaluative valence. Individuals prone to self-abasing humility, in contrast, reported lower agency and subjective power, and greater submissiveness, consistent with our expectation that self-abasing humility is linked to negative self-evaluations and concerns about being evaluated poorly by others, leading to the avoidance of social contact. However, when controlling for evaluative valence, self-abasing humility was also positively linked with communion; this result dovetails with the findings of Study 2 suggesting that self-abasing humility, like appreciative humility, may involve a desire to connect with others.

Next we turned to relations between humility and the Big Five personality traits. Consistent with our predictions, appreciative humility showed a moderate positive correlation with agreeableness, and weak correlations with the other traits; in contrast, self-abasing humility

showed a moderate negative correlation with extraversion, a small but positive correlation with neuroticism, and weak correlations with the other traits. These findings are consistent with our prediction that high agreeableness and a combination of low extraversion and high neuroticism predispose individuals to feel appreciative and self-abasing humility, respectively. However, when controlling for evaluative valence, self-abasing humility correlated positively with agreeableness, again pointing to the possibility that both sides of humility involve a desire to affiliate with others.

Finally, consistent with our expectation that modesty and humility are closely linked traits, both humility factors were strongly and positively correlated with dispositional modesty. Eight items overlapped between the modesty scale and the humility factors (*confident, content, honest, graceful, and humble*, which loaded highly on appreciative humility; *shy and embarrassed*, which loaded highly on self-abasing humility; and *unpretentious*, which did not load highly on either factor). The correlations between each humility factor and the modesty scale were nearly identical regardless of whether these eight words were or were not included ($r_s = .79$ and $.71$ for appreciative and self-abasing humility, versus $.72$ and $.67$, respectively), suggesting that the observed relations are not due to item overlap. These results indicate that modesty is strongly linked to both humility dimensions; this is in contrast to the results presented above, in which the word “modest” loaded much more strongly on the appreciative than the self-abasing humility factor. Taken together, this pattern of findings indicates that although the word “modest” is more closely tied to appreciative humility, the broader construct of modesty encompasses elements of both appreciative and self-abasing humility. Given the close link between modesty and humility, it seems likely that the same is true of the word “humble” *vis a vis* the construct of humility.

In summary, Study 3 corroborates the findings of Studies 1 and 2 by providing further evidence for the existence of the two distinct humility dimensions. The content of appreciative humility again appeared similar to that of agreeableness, whereas the content of self-abasing humility appeared to overlap with introversion, neuroticism, low self-esteem, and shame. The observed positive associations between appreciative humility and authentic pride, self-esteem, and prestige-based status suggest that appreciative humility arises following a personal success resulting in feelings of accomplishment and positive self-evaluations, and is related to earning respect and admiration from others. The associations between self-abasing humility and shame, embarrassment, and submissive behavior suggest, in contrast, that self-abasing humility arises following a personal failure in which one appraises him or herself as worthless compared to others and consequently seeks to hide from negative evaluations.

2.4 Study 4

Studies 1-3 provide converging evidence that the subjective experience of humility consists of two distinct dimensions, which each involve divergent eliciting events, self-evaluative cognitions, emotional feelings, and action tendencies. However, in all of these studies, conceptualizations of humility were drawn from lay persons. Unlike more basic emotions such as anger and fear, humility is clearly a complex experience, and one that has been the topic of philosophical and religious study for centuries. As a result, it is unclear whether lay people are able to adequately formulate or articulate a complete understanding of the construct; indeed, researchers have argued that the self-abasing conceptualization of humility should be disregarded because it originates primarily from the “average person on the streets”, and contradicts the majority of academic psychologists’ conceptualizations (Tangney, 2000, p. 71).

To examine whether the two-factor structure of humility is an artifact of lay knowledge, in Study 4 we sampled academic experts; specifically, members of editorial boards at major journals in philosophy and religious studies, two disciplines in which humility has been a central topic of inquiry for many years. We asked these experts to report their conceptualizations of humility, and then examined whether their responses mapped onto the same two conceptual dimensions—appreciative and self-abasing—that were identified in Studies 1-3. We also examined whether experts' conceptualizations of humility included words describing thoughts, emotions, and action tendencies, similar to those found to characterize lay perceptions and experiences of humility.¹²

2.4.1 Method

2.4.1.1 Participants

We searched SCImago Journal Rank to identify the five most highly ranked journals in the fields of philosophy and religious studies, with the condition that each journal was not also cross-listed in other fields (e.g., psychology). The five philosophy journals identified were *The Philosophical Review*, *Ethics*, *Nous*, *Mind*, and *Australasian Journal of Philosophy*. The five religious studies journals identified were *Journal for the Scientific Study of Religion*, *Journal of Empirical Theology*, *Journal of Reformed Theology*, *Religions*, and *Theological Studies*. We next compiled a list of editors at each of these journals ($n = 325$), from which we randomly selected 100 individuals to contact with a request to complete our online survey. Our final sample consisted of 19 experts who responded to our request (M age = 59.05, $SD = 9.43$, range = 38-72;

¹² We chose to include in our expert sample philosophers and religious scholars, rather than psychologists, because we psychological conceptualizations of humility were captured by our comprehensive literature review of psychological research on the construct, reviewed in the introduction. As our review suggests, psychologists who have studied humility view it as a uniformly positive and socially desirable construct.

63% male), the majority of whom reported primary affiliations with the fields of philosophy ($n = 11$; 58%) and religious studies/theology ($n = 6$; 32%).¹³

2.4.1.2 Procedure

Experts received the following instructions: “Please write down a list of words that reflect what people typically think, feel, and do when experiencing humility. These words or phrases could be characteristic of the thoughts in people’s heads, the behaviors people show, or the way people feel emotionally and physically.” We then compiled the resultant word lists into a final set of 126 unique words and 42 unique short phrases used to describe the humility experience (see Tables 4 and 5 for full list). Of these, *modest* ($n = 7$) and *humble* ($n = 3$) were the most frequently listed words; all other words were listed by 1 or 2 experts.

Next, six advanced psychology undergraduate students categorized each of the 168 words and phrases generated by experts as either appreciative or self-abasing humility. These coders, who were naïve to our hypotheses, were trained to identify the relevant form of humility using definitions of appreciative and self-abasing humility based on a subset of the highest-loading items on the valence-free appreciative and self-abasing humility factors that emerged in Studies 2 and 3. Specifically, coders were instructed that, “*appreciative humility* is characterized by consideration and kindness toward others, appreciation and understanding of one’s own and others’ positive qualities, and gracefulness in the face of success”, and that, “*self-abasing humility* is characterized by feelings of meekness and submissiveness, a sense of unimportance in the grand scheme of the world, and a desire to withdraw and be alone”. Coders were asked to decide whether each word and phrase generated by the expert sample best described appreciative

¹³ Of the two other experts included in this sample, one reported a primary affiliation with law, and another with psychology. Excluding the words listed by the expert whose primary affiliation was psychology did not change the nature of the results. Originally we had planned on sending the survey to all 325 experts; however, we felt that the 168 words and phrases generated by the initial 19 respondents provided a broad and representative sample of humility-related content, and therefore did not contact the remainder of experts.

humility, self-abasing humility, or neither. Coders showed strong agreement (mean Cohen's Kappa = .67; mean raw agreement = .82).

2.4.2 Results and discussion

2.4.2.1 Two forms of humility

Of the 126 expert-generated words, 44 (35%) were classified as appreciative humility by all six coders, and 34 (27%) were classified as self-abasing humility by all six coders. Similarly, of the 42 expert-generated phrases, 22 (52%) were classified as appreciative humility by all six coders, and 5 (12%) were classified as self-abasing humility by all six coders. This means that nearly two-thirds (63%) of all words and phrases generated by experts were viewed with complete consensus as capturing either appreciative or self-abasing humility by our naïve coders. Furthermore, if we examine categorizations that reached consensus for 5 out of 6 of coders, 85% of words and phrases were judged as characterizing one of the two humility factors (56% appreciative humility; 29% self-abasing humility).

We also examined the content of the 26 (15%) words and phrases that were not cleanly categorized as appreciative or self-abasing humility by at least 5 of 6 coders. Of these 26 words and phrases, 8 were categorized as appreciative or self-abasing humility by 4 coders, and an additional 14 were categorized as appreciative or self-abasing humility by 3 coders; thus, only four words or phrases were not reliably categorized as one or the other form of humility by at least 3 coders (“astonished”, “gendered”, “intense”, “not in the history books”).

Of the 26 words that were not cleanly categorized as appreciative or self-abasing humility by at least 5 coders, 13 were categorized as “neither” by two or more coders. Of these 13 words, 9 were categorized as appreciative or self-abasing humility by at least 3 coders; this left only 4 expert-generated words or phrases (the same four as above) that were categorized as “neither” by

two or more coders and *not* categorized reliably as either appreciative or self-abasing humility by at least three coders (see Tables 4 and 5 for exact codings for each word and phrase).

Nonetheless, to ensure that those words that elicited less consensual classification by our coders did not constitute a coherent third dimension of humility, we examined the content of the 26 words that were not categorized as either appreciative or self-abasing humility by at least five of the six coders. These words appeared to comprise an eclectic mix of components that have previously been theorized as part of humility (e.g., bashful, tender), emotions that may be part of humility (e.g., admiring, overawed), and action tendencies that might follow a humility experience (e.g., agentic, deferential). It is noteworthy that all of these words could describe either an appreciative or self-abasing humility experience, which may explain why the majority of our coders in fact categorized them as such.

2.4.2.2 Content of humility

We next examined whether experts' list of words and phrases contained elements linked to thoughts, feelings, and action tendencies that were similar to those we found associated with lay perceptions of appreciative and self-abasing humility. First, experts listed ten distinct emotions as components of the humility experience, including several associated with self-evaluation following a personal failure (e.g., ashamed, embarrassed). Experts also listed several words and phrases that describe self-evaluative cognitions that might follow personal success or failure (e.g., accepting, inferior, grounded, knowing where your worth lies, understanding one's limitations). Finally, experts listed several words or phrases that described action tendencies associated with celebrating others' accomplishments (e.g., admiring, selfless, valuing others' virtues) or hiding from others' evaluations (e.g., cowering, shrinking, not seen by others). These components align with those identified through our assessment of lay person experiences in

Studies 2 and 3. Furthermore, these results are consistent with what might be expected if appreciative and self-abasing humility each take the form of a separate emotion plot.

In sum, Study 4 provides evidence that the two-factor structure of humility is not an artifact of potentially misguided lay perceptions or semantic confusion; rather, the conceptualizations offered by academic experts in philosophy and theology largely map on to this same two-factor structure that includes both appreciative and self-abasing humility. Furthermore, the words and phrases experts used to describe humility overlap greatly with the thoughts, feelings, and action tendencies identified through our prior studies of lay humility experiences. These results suggest that not only do academic experts and lay persons share similar a view of humility, but also that they regard humility as involving two distinct experiential flavors—one that includes feelings of accomplishment and sparks a desire to celebrate others' accomplishments, and another that involves feelings of worthlessness and a desire to hide from others' evaluations.

2.5 Study 5

Studies 1-4 provide converging evidence that the conceptual structure and subjective experience of humility consists of two distinct dimensions, which involve divergent antecedent events, self-evaluative cognitions, distinct emotions, and other-oriented action tendencies. However, all of these findings relied exclusively on correlational methods, leaving open the question of whether feelings of appreciative and self-abasing humility experiences are causally related to the distinct sets of action tendencies they are associated with. That is, do experiences of appreciative humility directly lead to action tendencies involving other appreciation and connection, while experiences of self-abasing humility directly lead to action tendencies involving avoidance and hiding? In Study 5 we tested whether the two forms of humility could

be experimentally induced, and, if so, whether these distinct experiences would produce corresponding changes in behavioral action tendencies.

2.5.1 Method

2.5.1.1 Participants

Two-hundred five undergraduate students (71% women) participated for course credit.

2.5.1.2 Procedure

Participants were randomly assigned to write about a time they had experienced either appreciative ($n = 96$) or self-abasing ($n = 108$) humility; as in Study 4, the two forms of humility were defined using high loading words from the valence-free appreciative and self-abasing humility factors from Studies 2 and 3. Specifically, participants assigned to recall appreciative humility were told that, “by humility, we mean an event when you felt *considerate*, *compassionate*, and *understanding* toward others, when you showed *kindness and generosity*, and when you displayed *gracefulness*.” In contrast, participants assigned to recall self-abasing humility were told, “by humility, we mean an event when you felt *unimportant*, *small*, and *worthless* compared to others, when you showed *meekness* and *submissiveness*, and when you displayed *shamefulness*.”

Additionally, in light of the findings from Study 2 suggesting that appreciative humility typically follows successes and self-abasing humility typically follows failures, we also sought to explore whether each form of humility could, under certain circumstances, occur following both success and failure. We therefore also randomly assigned participants to recall a humility experience that followed either a personal success or a personal failure; this factor was fully crossed with humility dimension, creating a total of four conditions (i.e., appreciative humility following success [$n = 49$], appreciative humility following failure [$n = 47$], self-abasing

humility following success [$n = 51$], and self-abasing humility following failure [$n = 58$]). To check the validity of our success vs. failure manipulation, three undergraduates naïve to hypotheses and blind to condition coded participants' narratives for whether they described a personal success or failure. Coders showed good agreement (mean Cohen's Kappa = .84; mean raw agreement = .92); each narrative was therefore classified as concerning either a success or failure, based on how the majority of coders viewed it.

As a manipulation check, after recalling their humility experiences, participants rated how intensely they felt each form of humility, using six items drawn from the prior studies to capture each humility dimension. These items were chosen by identifying all those that had primary loadings of .50 or greater on appreciative or self-abasing humility and cross-loadings of less than .30 in both Studies 2 and 3, and then eliminating items that appeared to reflect evaluative valence rather than substantive content. These criteria led to the inclusion of the following 6 items for appreciative humility: “compassionate”, “considerate”, “generous”, “graceful”, “kind,” and “understanding” ($\alpha = .94$); and the following 6 items for self-abasing humility: “meek”, “shameful”, “small”, “submissive”, “unimportant”, and “worthless” ($\alpha = .87$). Of note, the items used here to assess appreciative humility include five items previously identified as markers of agreeableness (i.e., all except for “graceful”; Goldberg, 1990; 1992). Similarly, several of the items used here to assess self-abasing humility are similar to markers of introversion (e.g., meek, submissive), neuroticism (e.g., unimportant; Goldberg, 1990; 1992), low self-esteem (i.e., “worthless”; Rosenberg, 1965), and shame (i.e., “shameful”; Tangney & Dearing, 2002).¹⁴ Our ad-hoc measure of appreciative humility may therefore be viewed as similar to measures of agreeableness, whereas our self-abasing humility measure may be viewed as a measure capturing a blend of several existing constructs.

¹⁴ Due to experimenter error, however, ratings of these items were available for only 184 participants.

Finally, to test whether manipulated experiences of appreciative vs. self-abasing humility would be causally related to divergent sets of action tendencies, after writing their narratives participants also rated the extent to which they wished to engage in several action tendencies at the time of the event. We created a list of possible action tendencies that might follow a humility episode based on the narratives of humility episodes collected in Study 2. Specifically, the first author read each narrative from Study 2 and wrote an item to capture every behavior that was described as a response to humility, while avoiding redundancy. Participants responded to each of the resulting 56 items using a five-point scale (1 = “not at all”; 5 = “very much”; see Table S2). A principal components of these 56 items suggested that they were characterized primarily by two components; the first seven eigenvalues of the principal components analysis were 11.18, 7.59, 3.21, 2.93, 2.02, 1.81, and 1.63, and the first two accounted for 34% of the variance in the data. The two components could be described as celebrating others’ accomplishments (e.g., “I acted extra nice to people”; “I acknowledged the talents of others”, “I pointed out other people's impressive accomplishments”) and hiding from others’ evaluations (e.g., “I became extremely quiet”; “I wanted to run away”, “I kept quiet about something I had done”).

2.5.2 Results and discussion

2.5.2.1 Humility manipulation

Confirming our successful manipulation of humility experiences, participants assigned to recall an appreciative humility experience reported greater appreciative humility ($M_{\text{Appreciative}} = 3.42$; $SD = 1.14$) than self-abasing humility ($M_{\text{Self-abasing}} = 2.39$, $SD = 1.05$; $t(182) = 6.40$, $p < .001$, $d = .94$), whereas participants assigned to recall a self-abasing humility experience reported greater self-abasing ($M = 3.30$; $SD = .88$) than appreciative humility ($M = 2.19$; $SD = 1.01$; $t(182) = 8.04$, $p < .001$, $d = 1.18$). Notably, unlike in Studies 2-4, appreciative and self-abasing humility

were strongly negatively correlated, $r = -.52, p < .001$, suggesting that these induced humility experiences consisted primarily of the particular form of humility that participants were assigned to recall and not the other form; this is likely due to the fact that participants were explicitly instructed to recall an event that involved one of the two forms of humility.

2.5.2.2 Event manipulation

Based on our coders' analyses of the written narratives, participants had a great deal of difficulty following instructions for the success/failure manipulation. Of those participants assigned to write about appreciative humility following a failure, 38% ($n = 18$) instead wrote about a success; in contrast, only 12% ($n = 6$) of participants assigned to write about appreciative humility following success instead wrote about a failure. Similarly, of those participants assigned to write about self-abasing humility following a success, 65% ($n = 33$) instead wrote about a failure; in contrast, only one participant (2%) assigned to write about self-abasing humility following a failure instead wrote about a success.

These rates suggest that participants had difficulty recalling appreciative humility episodes that followed failures, and self-abasing humility episodes that followed successes, consistent with the finding of Study 2 that appreciative humility most typically follows success, and self-abasing humility most typically follows failure. Given that 50% of participants in the two incompatible conditions (appreciative humility/failure and self-abasing humility/success) did not comply with our instructions, we collapsed the data across the success/failure manipulation within each humility dimension for all subsequent analyses. Results were conceptually similar when the data were examined separately for the four original experimental conditions (see online supplement for full details).

2.5.2.3 Action tendencies

To examine the action tendencies that underpin each form of humility, we compared the component scores for the two action tendency components between experimental conditions. As predicted, appreciative and self-abasing humility led to divergent sets of action tendencies. Episodes of appreciative humility caused participants to report a stronger desire to celebrate others' accomplishments ($M = .30$, $SD = .88$) than did episodes of self-abasing humility ($M = -.26$, $SD = 1.03$; $t(203) = 4.19$, $p < .001$, $d = .58$); in contrast, self-abasing humility led to a greater desire to hide from others' evaluations ($M = .35$; $SD = .88$) than did appreciative humility ($M = -.39$, $SD = .98$; $t(203) = 5.68$, $p < .001$, $d = .79$). Corroborating these experimental results, self-reported appreciative humility was correlated strongly and positively with the action tendency to celebrate others' accomplishments ($r = .64$, $p < .001$), and moderately and negatively with the tendency to hide from others' evaluations ($r = -.36$, $p < .001$); in contrast, self-reported self-abasing humility was correlated strongly and positively with the action tendency to hide from others' evaluations ($r = .65$, $p < .001$), and moderately and negatively with the tendency to celebrate others' accomplishments ($r = -.21$, $p < .001$). Together, these findings thus provide the first evidence that appreciative and self-abasing humility are causally related to distinct action tendencies.

2.6 General discussion

The present research provides the first empirical examination of the psychological structure of humility. Converging evidence from five studies suggests that humility is characterized by two distinct dimensions, one of which involves feelings of appreciation for others and oneself, and the other of which involves feelings of self-abasement. We also found converging evidence that the two dimensions of humility each involve distinct sets of antecedent

events, self-evaluative cognitions, emotions, and other-oriented action tendencies. Appreciative humility typically follows personal successes, involves action tendencies meant to celebrate others, and is linked to emotional and personality dispositions that underlie success and achievement, such as authentic pride and prestige-based status. In contrast, self-abasing humility typically follows personal failures, involves negative self-evaluative cognitions and action tendencies oriented toward hiding from others' evaluations, and is linked to emotional and personality dispositions that underlie failure and withdrawal, such as shame, low self-esteem, and submissiveness. The complexity of these humility experiences is consistent with the concept of an emotion plot—a prolonged episode involving a predictable set of thoughts, feelings, and behaviors—which provides a coherent framework through which to understand humility.

Evidence for two distinct humility factors emerged across studies that: (a) examined the semantic similarity of humility-related words (Study 1); (b) assessed momentary humility episodes (Study 2); (c) assessed individuals' dispositional tendency toward humility (Study 3); (d) examined humility related words generated by lay persons and academic experts (Studies 1 and 4); and (e) experimentally induced the two forms of humility (Study 5). We also demonstrated that the same two-factor structure emerges when participants are explicitly told that humility is distinct from humiliation, suggesting that the self-abasing factor is not an artifact of confusion between these two words. Across all reported analyses, we demonstrated that the two factors of humility are not mere artifacts of people's tendency to distinguish between positive and negative valence or social desirability or undesirability, as the two-factor structure emerged when variance due to valence and social desirability was statistically removed. However, although the observed associations between each form of humility and distinct antecedent events, cognitions, and action tendencies also emerged even after evaluative valence

was controlled for, several of these associations became weaker. Below, we discuss the implications of these findings for researchers' understanding of humility, and outline several future research directions.

2.6.1 Toward a nuanced, empirically based understanding of humility

The present research helps clarify the psychological content of humility, an issue that has not received adequate empirical attention in prior work. In prior conceptualizations, psychologists have uniformly viewed humility as a positive, socially desirable construct involving appreciation for oneself and others (e.g., Chancellor & Lyubomirsky, 2013; Davis et al., 2010; Peterson & Seligman, 2004; Tangney, 2000), despite traces of evidence in dictionary definitions, philosophical and theological accounts, and empirical psychological studies that humility may also have a darker side (e.g., Exline & Geyer, 2004; Gregg et al., 2008; Tucker, 2015).

In contrast, our findings suggest that humility in fact comes in *two* forms—one related to appreciation for the self and others, and one related to self-abasement—that each involve distinct antecedent events, cognitions and emotions linked to *self-evaluation*, and action tendencies facilitating *other-recognition*, each of which have been viewed as central cognitive components of humility in prior work (e.g., Chancellor & Lyubomirsky, 2013; Davis et al., 2010; Tangney, 2000). Appreciative humility typically arises following a personal success, which allows individuals to feel pride about their achievements, but at the same time facilitates a heightened awareness of and kindness toward others. This strong other focus may be why appreciative humility motivates individuals to celebrate others, as was seen in Study 5, but it may also introduce a sense that one's own accomplishment is inferior to that of others. Appreciative humility is therefore likely to promote relatively balanced self-perceptions, in line with prior

theory (Tangney, 2000; Peterson & Seligman, 2004). In contrast, self-abasing humility typically arises following perceived failures, which make individuals aware of their inferiority compared to others, resulting in negative self-perceptions and a desire to hide from others' evaluations.

Appreciative and self-abasing humility are also each linked to a distinct set of emotional and personality dispositions that tend to follow personal successes and failures and self-evaluation. Individuals who experience appreciative humility tend to feel authentic pride and show a proneness toward guilt, and report greater prestige; these characteristics portray an individual who experiences frequent success but maintains a grounded view of herself while attending to the needs of others, thereby accruing a reputation of prestige-based status. In contrast, individuals who experience self-abasing humility tend to feel shame, have low self-esteem, and report frequent submissive behaviors and a sense of low inclusionary status; these characteristics portray an individual who fails to accomplish desired goals, and views himself as worthless and deserving of low status.

2.6.2 Locating humility within the landscape of personality and emotion

Based on the content of appreciative and self-abasing humility that emerged across these five studies, it would be misleading to view these dimensions as entirely novel constructs. Appreciative humility appears similar to agreeableness, as many of the words defining appreciative humility have been previously identified as markers of, or synonymous with, agreeableness (e.g., considerate, kind, generous; Goldberg, 1990; 1992). Self-abasing humility appears to tap into a more eclectic mix of constructs. The consistent emergence of “shameful” and “ashamed” as the most representative markers of this dimension (as suggested by the high factor loadings) indicates that shame is part of self-abasing humility, and the presence of “worthless” and “unimportant” suggest that low self-esteem is also a key component of the

construct (Rosenberg, 1965). Additionally, several of the words that consistently define self-abasing humility are similar to markers of introversion (e.g., meek, submissive) and neuroticism (e.g., worthless; Goldberg, 1990; 1992).

In fact, consistent with the notion that appreciative humility reflects aspects of agreeableness and self-abasing humility partly reflects introversion and neuroticism, Costa and McCrae (1992) have conceptualized each Big Five trait as being constituted by six lower-order facets, several of which map onto the content identified in each dimension of humility. For example, one facet of agreeableness is modesty (Costa & McCrae, 1992), a trait that is closely related to humility (e.g., Chancellor & Lyubomirsky, 2013; Davis et al., 2010; Peterson & Seligman, 2004; Tangney, 2000).¹⁵ Similarly, self-abasing humility appears to be represented in facets of both (low) extraversion and neuroticism (Costa & McCrae, 1992); the assertiveness facet of extraversion appears to represent the antithesis of the submissive behavior found to characterize self-abasing humility, and the self-consciousness facet of neuroticism appears to capture the feelings of embarrassment and shame which characterize episodes of self-abasing humility.

How might we make sense of this conceptual overlap? One possibility is that an individual's standing on a Big Five trait predisposes him or her to experience a certain form of humility. This view of personality traits as providing a mental preparedness to experience certain emotional states is similar to the perspective put forth by Costa and McCrae (1980), that "extraversion... predisposes individuals toward positive affect, whereas neuroticism... predisposes individuals toward negative affect" (p. 673; see also Larsen & Ketelaar, 1991). High

¹⁵ Of note, modesty also appears as one of four facets of the broad trait honesty-humility, a sixth factor of personality included in the HEXACO model (Ashton & Lee, 2007; Ashton, Lee, & De Vries, 2014). Despite debates concerning whether human personality is best characterized by five or six factors, the fact that modesty is represented in both the agreeableness domain on the Big Five and the honesty-humility domain of the HEXACO supports the view that appreciative humility likely aligns with one of the major dimensions of personality.

levels of dispositional agreeableness may predispose individuals toward feeling appreciative humility; initial evidence from Study 3 supports this possibility; the dispositional tendency to feel appreciative humility correlated .27 with agreeableness (controlling for evaluative valence), which was the strongest correlation among all Big Five traits. Importantly, however, the modest magnitude of this correlation indicates that, despite the overlap, appreciative humility and agreeableness are distinct constructs. Agreeableness, like all of the Big Five traits, is an extremely broad personality dimension. It is therefore likely that experiencing appreciative humility implies that one is being agreeable (i.e., appreciative humility is one instantiation of agreeableness), but that being agreeable does not necessarily imply that one is experiencing appreciative humility (i.e., there are many other ways of being agreeable).

In contrast, low levels of dispositional extraversion, combined with high levels of dispositional neuroticism, may predispose individuals to feeling self-abasing humility; Study 3 again supports this possibility, as the dispositional tendency to feel self-abasing humility was correlated -.34 with extraversion and .24 with neuroticism (also the highest correlations among all Big Five traits; again, controlling for evaluative variance). The link between self-abasing humility and both low extraversion and high neuroticism, however, is likely only part of the story. Our results consistently show that the constructs of shame and low self-esteem are also critical components of self-abasing humility.

Despite the apparent plausibility of an account in which one or more Big Five traits predispose an individual to experience appreciative or self-abasing humility, the present research does not directly test the nature of the relation between humility and broader personality dimensions. An important direction for future work thus involves examining how humility fits into existing structures of human personality, so as to integrate the present findings with prior

work on major individual difference dimensions, as well as to further our understanding of how the two forms of humility can be meaningfully differentiated.

2.6.3 Improving research on humility

Our findings point to the importance of conceptualizing and measuring both forms of humility in subsequent empirical work. This research, which employed a bottom-up approach, suggests that previous conceptualizations of humility as involving accurate self-knowledge and other-orientated, pro-social motivations (e.g., Chancellor & Lyubomirsky, 2013; Davis et al., 2010; Tangney, 2000) in fact reflects the narrower construct of *appreciative humility*; not surprisingly, these prior findings have painted an exclusively positive, socially desirable picture of the construct (e.g., Davis et al., 2013; Exline & Hill, 2012; Kesebir, 2014; Kruse et al., 2014; Tong et al., 2016). One contributing factor to this trend may be that all existing scales used to measure humility are comprised of items capturing content that would fall within the domain of appreciative humility, at the exclusion of self-abasing humility (see Davis & Hook, 2014, for a review). The present results suggest that when a conceptualization of self-abasement is included and assessed, a different set of causes, correlates, and consequences emerge.

It is also worth noting that although “humble” and “modest” appear to be face-valid markers of the construct humility, and therefore appealing measurement tools, our findings suggest that manipulating or measuring humility with these two words is suboptimal. Both of these words loaded only weakly to moderately on the appreciative humility factor and a general humility factor, and very weakly on the self-abasing humility factor. These findings suggest that these two words primarily capture appreciative humility, but are not the most central items defining that dimension, and are therefore not ideal measurement tools to capture the complex, multifaceted construct of humility, or appreciative humility alone. If researchers wish to capture

appreciative or self-abasing humility via self-report, they would be best served assessing those states with items that more directly correspond to the core content of those constructs.

2.6.4 Limitations and future directions

The present research has several limitations, some of which point to intriguing directions for future research. First, although we found suggestive evidence that appreciative and self-abasing humility both contain components expected to comprise the humility emotion plot, we did not examine how these components unfold over time. For example, although we experimentally induced experiences of appreciative and self-abasing humility in Study 5, we did not examine which antecedents play a causal role in bringing about each form of humility. The findings from Studies 2 and 5 are suggestive in this regard, raising the possibility that events perceived largely as successes promote appreciative humility whereas events perceived as failures promote self-abasing humility. In addition, although we suggested that upward social comparisons are a key cognitive component in the humility emotion plot, as individuals recognize that others' accomplishments are superior to their own, we did not directly test whether people engage in such comparisons during humility episodes. The findings of Studies 1 and 4 are suggestive in this regard, as both lay persons and academic experts listed humility-related words that are typically used to describe upward social comparisons (e.g., diminished, inferior, small). However, future studies are needed to directly test for a causal relation between success and failure events, as well as examine the role of upward social comparisons in humility experiences.

Similarly, although we examined the link between the tendency to feel appreciative and self-abasing humility and various emotional dispositions, we did not examine how these emotional feelings play out in momentary humility episodes, or whether they have a causal role

in promoting the action tendencies that are integral to humility. For example, do feelings of authentic pride and guilt lead individuals experiencing appreciative humility to recognize and celebrate others' accomplishments, and do feelings of shame and embarrassment lead individuals experiencing self-abasing humility to withdraw and hide from others' evaluations? Future work should address these questions with more powerful designs, such as experience-sampling or longitudinal data collection. These approaches would allow researchers to capture the *process* implied in our emotion plot account; specifically, does humility follow daily successes and failures and involve a sequence of self-evaluative cognitions, distinct emotions, and action tendencies that play out over the course of a single episode?

A third limitation is that our studies employed samples exclusively drawn from Western populations, making it important to examine whether the two-factor structure of humility generalizes across cultures. More broadly, even if two-factors of humility are found to exist in wide variety of populations, it is questionable whether self-abasing humility would be considered a “dark side” of the experience everywhere. A large body of research has shown that self-enhancing motivations are generally stronger among Westerners compared to members of East Asian cultures, where Confucian philosophy has historically emphasized self-effacement (Heine & Hamamura, 2007; Heine, Lehman, Markus, & Kitayama, 1999). The pervasiveness of self-critical tendencies among East Asians raises the possibility that self-abasing humility might be considered a desirable experience in East Asian cultures, in the same way that appreciative humility has been described as a virtue in prior work in the Western world (e.g., Chancellor & Lyubomirsky, 2013; Peterson & Seligman, 2004). Future research should therefore seek to assess the two-factor structure of humility, as well as individuals' views toward each humility factor, in an East Asian population.

Finally, the present research did not examine the social functions of humility, leaving this an important open question for future work. Functionalist accounts of emotions suggest that the action tendencies motivated by distinct emotional experiences serve an adaptive purpose (Keltner & Gross, 1999; Fridja, 1988). What, then, is the function of humility? Studies 3 and 4 may provide clues. In convergence with other recent work (Davis et al., 2013), these results link appreciative humility to prestige-based status and communion, suggesting that this form of humility may help individuals foster in others the perception that they are skilled and competent yet pro-social group members, who deserve admiration and a corresponding boost in social rank (Cheng et al. 2013). Experiencing appreciative humility alongside authentic pride in response to success may help individuals avoid excessively focusing on their own accomplishments and prompt them to recognize the role played by others—which in turn should ensure their receipt of a deserved status increase.

The function of self-abasing humility is less clear, given its association with submissive behavior and low agency, both of which may lead individuals to be perceived as aloof and low in status (Anderson & Kilduff, 2009). One intriguing possibility is that, similar to shame, self-abasing humility may be derived from ancient submissive strategies used to signal one's awareness of a failure or decline in social standing (Fessler, 2007; Gilbert, 1997). Such signals may play an important role in communicating the humble individual's willingness to relinquish power or resources. Also like shame, self-abasing humility may motivate individuals to withdraw from social situations where they would otherwise face anger and even punishment for a transgression or failure. In contrast to shame, however, results of Studies 2 and 3 show that, once evaluative valence is controlled for, self-abasing humility is positively associated with a range of affiliative behaviors and traits, including a desire to express gratitude and seek out others, as well

as dispositional communion and agreeableness. Self-abasing humility may therefore involve a simultaneous desire to hide from others' evaluations and connect with others, pointing to a more complex and perhaps more socially advantageous function than that associated with shame. It is beyond the scope of the present data to adjudicate these possibilities; an important avenue for future work is therefore to pin down the social functions of both forms of humility.

2.6.5 Conclusion

The current research presented a novel model of humility as consisting of two distinct dimensions, based on lay-person and academic-expert conceptualizations of humility, and self-reports of its subjective experience. Appreciative humility typically arises following success, is characterized by authentic pride and prestige-based status, and leads people to celebrate others' accomplishments. In contrast, self-abasing humility typically arises following failures, involves a low appraisal of one's skills and competence, is characterized by feelings of shame, and leads people to show submissive behavior and to avoid the evaluations of others. Our analyses help shed light on the existence of a self-abasing side to humility, which has, to date, not been acknowledged by psychologists. We hope that the present findings will spark future research into the causes, consequences, and dynamics of both sides of this complex emotional experience.

Table 1: Factor loadings of humility-related items at a momentary state level (Study 2) and a dispositional level (Study 3)

Item	Study 2 State Humility		Study 3 Trait Humility	
	Appreciative Humility (Factor 1)	Self-Abasing Humility (Factor 2)	Appreciative Humility (Factor 1)	Self-Abasing Humility (Factor 2)
Kind	0.78 (.75)	-0.14	0.68 (.66)	(.19)
Generous	0.77 (.74)	-0.16	0.69 (.64)	(.20)
Helpful	0.74 (.64)	-0.24	0.69 (.62)	-0.14 (.11)
Good	0.73 (.56)	-0.50	0.73 (.63)	-0.22 (.14)
Understanding	0.71 (.69)		0.59 (.58)	(.16)
Graceful	0.71 (.60)	-0.17 (.15)	0.67 (.62)	(.20)
Considerate	0.70 (.67)	-0.18	0.68 (.71)	(.13)
Friendly	0.70 (.60)	-0.29	0.68 (.59)	-0.23 (.10)
Peaceful	0.70 (.56)	-0.11 (.24)	0.66 (.47)	-0.27 (.24)
Pleased	0.69 (.43)	-0.57 (.28)	0.64 (.33)	-0.45 (.37)
Satisfied	0.67 (.42)	-0.56 (.12)	0.55 (.21)	-0.59 (.11)
Connected	0.67 (.56)	-0.24	0.59 (.42)	-0.36
Happy	0.66 (.38)	-0.62 (.33)	0.59 (.27)	-0.58 (.21)
Smile	0.65 (.43)	-0.40 (.21)	0.58 (.45)	-0.29 (.19)
Content	0.63 (.34)	-0.58 (.11)	0.62 (.30)	-0.51 (.24)
Compassionate	0.63 (.58)		0.60 (.64)	0.12 (.20)
Respectful	0.61 (.55)	(.14)	0.60 (.54)	(.18)
Relaxed	0.60 (.44)	-0.22	0.57 (.27)	-0.37 (.19)
Wisdom	0.60 (.48)	-0.19 (.14)	0.54 (.42)	-0.25
Equal	0.58 (.48)	-0.20	0.56 (.39)	-0.42
Confident	0.57 (.38)	-0.55	0.51 (.30)	-0.52 (.15)
Honest	0.56 (.50)	(.11)	0.52 (.45)	
Accepting	0.56 (.41)	-0.24	0.62 (.54)	(.14)
Accomplished	0.55 (.27)	-0.62	0.50 (.24)	-0.51
Empathic	0.55 (.58)	0.12	0.31 (.40)	0.19
Self-worthy	0.53 (.33)	-0.44	0.51 (.33)	-0.45
Worldly	0.51 (.46)	(.15)	0.30 (.21)	-0.23
Proud	0.48 (.23)	-0.54	0.44 (.21)	-0.44
Calm	0.42 (.27)	-0.20	0.51 (.28)	-0.30 (.12)
Obedient	0.39 (.44)	0.28 (.38)	0.45 (.38)	0.11 (.36)
Humble	0.39 (.34)	(.10)	0.58 (.54)	(.18)
Human	0.35 (.36)	0.11	0.44 (.37)	-0.11
Modest	0.30 (.25)	-0.15 (.17)	0.43 (.44)	0.15 (.18)
Hot	0.13 (.13)	(.35)	0.24 (.19)	-0.11 (.10)
Unhappy	-0.34 (.41)	0.82 (.35)	-0.33 (.31)	0.76 (.21)
Shameful	-0.31	0.78 (.53)	-0.23	0.61 (.49)
Sad	-0.23 (.27)	0.77 (.24)	-0.28 (.26)	0.75 (.29)

Item	Study 2 State Humility		Study 3 Trait Humility	
	Appreciative Humility (Factor 1)	Self-Abasing Humility (Factor 2)	Appreciative Humility (Factor 1)	Self-Abasing Humility (Factor 2)
Unimportant	-0.24 (.15)	0.77 (.48)	-0.27 (.14)	0.78 (.42)
Ashamed	-0.31 (.23)	0.75 (.44)	-0.21	0.63 (.52)
Small		0.74 (.52)	-0.13	0.54 (.46)
Worthless	-0.30	0.71 (.47)	-0.29	0.74 (.43)
Stupid	-0.29	0.70 (.51)	-0.27	0.61 (.52)
Guilty	-0.23	0.61 (.28)	-0.23	0.49 (.44)
Submissive	(.21)	0.49 (.46)	(.16)	0.52 (.55)
Embarrassed	-0.29 (-.13)	0.47 (.40)	-0.14	0.64 (.66)
Anxious	-0.21	0.45 (.35)	-0.14 (.16)	0.56 (.31)
Quiet	0.12 (.25)	0.43 (.48)		0.33 (.32)
Meek	(.22)	0.41 (.44)	0.10 (.22)	0.49 (.56)
Shy		0.37 (.52)	(.14)	0.52 (.52)
Self-conscious	-0.17	0.37 (.41)	(.21)	0.57 (.44)
Simple	0.28 (.35)	0.37 (.42)	0.19 (.13)	0.24 (.44)
Reserved	0.16 (.25)	0.29 (.33)	0.20 (.19)	0.23 (.34)
Unpretentious	0.13 (.26)	0.26 (.13)	(.13)	0.24
Blushing		(.35)		0.31 (.50)

Note: Study 2: $N = 648$; Study 3: $N = 462$. Loadings $< |.10|$ are not presented and loadings $> |.40|$ are shown in bold. Loadings in parentheses are from valence-free factor analyses (i.e., evaluative valence was statistically removed from each humility word before running factor analyses).

Table 2: Correlations (and partial correlations controlling for evaluative valence) of state appreciative humility and state self-abasing humility factor scores with on-line cognitions and self-perceptions, as coded from humility narratives (Study 2; Sample 1)

	Appreciative humility	Self-abasing humility
Behavioral Tendencies		
Express Gratitude or Appreciation ^a	.32* (.27*)	.05 (.28*)
Seek Interpersonal Connection ^a	.29* (.30*)	.10* (.29*)
Help Others ^a	.39* (.38*)	.05 (.30*)
Hide ^b	-.32* (-.14)	.21* (-.02)
Be Alone ^a	-.12* (.16*)	.47* (.35*)
Self-Perceptions		
Positive Self-Insights ^b	.41* (.08)	-.35* (.03)
Intelligent ^a	.20* (-.04)	-.36* (-.18*)
Achieving ^a	.28* (-.08)	-.51* (-.25*)
Moral ^a	.21* (.09*)	-.22* (-.11*)
Important and Significant ^a	.24* (-.10*)	-.52* (-.30*)
Powerful and in Control ^a	.25* (-.03)	-.42* (-.19*)
Negative Self-Insights	-.39* (-.01)	.46* (.13)
Ignorant and Unwise ^a	-.17* (.01)	.29* (.15*)

Note. ^a = Assessed in Samples 1 and 2 ($n = 542$). ^b = Assessed in Sample 1 only ($n = 161$). Correlations in parentheses are partial correlations controlling for evaluative valence.

* $p < .05$

Table 3: Correlations (and partial correlations controlling for evaluative valence) of trait appreciative humility and trait self-abasing humility factor scores with emotional dispositions and personality traits (Study 3)

	Appreciative humility	Self-abasing humility
Emotional Dispositions		
Guilt-free Shame ^b	-.15 (.14)	-.50* (.26*)
Shame-free Guilt ^b	.24* (.16*)	-.12 (.06)
Authentic Pride ^a	.66* (.44*)	-.62* (-.13)
Hubristic Pride ^a	-.08 (-.02)	.15* (.10*)
Embarrassability ^b	.08 (.35*)	.51* (.43*)
Modesty ^a	.68* (.79*)	.37* (.71*)
Personality Traits		
Self-Esteem ^a	.40* (.03)	-.68* (-.31*)
Narcissism ^a	.09 (.08)	-.10 (-.12)
Agency ^b	.15* (-.04)	-.45* (-.35*)
Subjective Power ^b	.27* (.02)	-.47* (-.21*)
Prestige ^b	.56* (.40*)	-.36* (-.05)
Inclusionary Status ^b	.38* (.07)	-.51* (-.05)
Communion ^b	.49* (.46*)	.04 (.37*)
Submissive Behavior ^b	-.16* (.12)	.56* (.39*)
Extraversion ^b	.22* (-.05)	-.55* (-.34*)
Agreeableness ^b	.42* (.27*)	-.22* (.16*)
Conscientiousness ^b	.20* (.06)	-.27* (-.08)
Neuroticism ^b	-.27* (.07)	.58* (.24*)
Openness ^b	.24* (.14*)	-.20* (-.03)

Note. ^a = Assessed in Samples 1 and 2 ($n = 462$). ^b = Assessed in Sample 1 only ($n = 192$).

Correlations in parentheses are partial correlations, controlling for evaluative valence.

Correlations with shame and guilt use residualized scores, controlling for guilt and shame, respectively (Tangney & Dearing, 2002). Values associated with self-esteem are part correlations controlling for narcissism, and values associated with narcissism are part correlations controlling for self-esteem (see Paulhus et al., 2004).

* $p < .05$

Table 4: Humility-related words generated by academic experts (Study 4)

Word	Appreciative Humility	Self-Abasing Humility	Neither
Appreciative Humility			
accepting	6	0	0
adaptable	6	0	0
appreciating	6	0	0
collaborative	6	0	0
compassionate	6	0	0
connected	6	0	0
constructive	6	0	0
curious	6	0	0
dignified	6	0	0
equal	6	0	0
friendly	6	0	0
generous	6	0	0
graceful	6	0	0
grateful	6	0	0
grounded	6	0	0
happy	6	0	0
Honest	6	0	0
humble	6	0	0
learning	6	0	0
listening	6	0	0
loving	6	0	0
mature	6	0	0
mindful	6	0	0
modest	6	0	0
mutual	6	0	0
non-arrogant	6	0	0
non-boastful	6	0	0
non-competitive	6	0	0
non-controlling	6	0	0
non-domineering	6	0	0
non-judgmental	6	0	0
non-superior	6	0	0
non-vain	6	0	0
open	6	0	0
open-minded	6	0	0
partnering	6	0	0
respectful	6	0	0
secure	6	0	0
self-discovering	6	0	0
self-reflective	6	0	0
self-understanding	6	0	0
stable	6	0	0
strong	6	0	0

Word	Appreciative Humility	Self-Abasing Humility	Neither
Appreciative Humility (cont'd)			
understanding	6	0	0
attentive	5	1	0
aware	5	1	0
calm	5	1	0
caring	5	1	0
dialogue	5	1	0
faithful	5	0	1
hopeful	5	0	1
intimate	5	0	1
maternal	5	0	1
non-authoritative	5	1	0
responsible	5	0	1
self-effacing	5	1	0
selfless	5	0	1
social	5	1	0
tender	5	0	1
tolerating	5	1	0
admiring	4	2	6
deferential	4	2	0
serving	4	1	1
accurate	3	2	1
agentic	3	2	1
assertive	3	1	2
concerned	3	2	1
fallible	3	2	1
fearless	3	1	2
Interdependent	3	1	2
Self-Abasing Humility			
apologetic	0	6	0
ashamed	0	6	0
conflicted	0	6	0
cowering	0	6	0
cringing	0	6	0
degraded	0	6	0
depressed	0	6	0
diminished	0	6	0
down	0	6	0
downcast	0	6	0
embarrassed	0	6	0
fearful	0	6	0
hiding	0	6	0
humiliated	0	6	0
Little	0	6	0

Word	Appreciative Humility	Self-Abasing Humility	Neither
Self-Abasing Humility (cont'd)			
lowly	0	6	0
sad	0	6	0
self-critical	0	6	0
self-deprecating	0	6	0
shameful	0	6	0
sheepish	0	6	0
shrinking	0	6	0
Small	0	6	0
submissive	0	6	0
subservient	0	6	0
surrendering	0	6	0
unassertive	0	6	0
unconfident	0	6	0
Under	0	6	0
Unimportant	0	6	0
vulnerable	0	6	0
wary	0	6	0
weak	0	6	0
remorseful	1	5	0
wistful	1	5	0
contrite	0	5	1
inferior	0	5	1
longing	0	5	1
removed	0	5	1
shuffling	0	5	1
shy	0	5	1
tearful	0	5	1
trembling	0	5	1
blushing	2	4	0
undemanding	2	4	0
Dependent	0	4	2
mistaken	0	4	2
bashful	2	3	1
searching	2	3	1
simple	2	3	1
overawed	1	3	2
manipulative	0	3	3
unconcerned	0	3	3
Neither			
gendered	0	2	4
intense	1	2	3
astonished	2	2	2

Note:

Entries in the columns “Appreciative Humility”, “Self-Abasing Humility” and “Neither” refer to the number of coders (out of 6) who categorized the word as best describing each form of humility (or as describing neither of the two forms). For example, the final entry indicates that the word “astonished” was viewed by 2 coders as best capturing appreciative humility, by 2 coders as best capturing self-abasing humility, and by 2 coders as capturing neither form of humility.

Dark blue words were categorized as appreciative humility by 5 or 6 coders.

Dark green words were categorized as self-abasing humility by 5 or 6 coders.

Light blue words were categorized as appreciative humility by 3 or 4 coders.

Light green words were categorized as self-abasing humility by 3 or 4 coders.

Table 5: Humility-related short phrases generated by academic experts (Study 5)

Short Phrase	Appreciative Humility	Self-Abasing Humility	Neither
Appreciative Humility			
able to look others in the eye	6	0	0
able to show this is an appropriate way to act and be	6	0	0
acknowledging that you are one among many	6	0	0
allowing that others are better at certain things	6	0	0
appreciating one's failures	6	0	0
at peace	6	0	0
aware of finitude	6	0	0
aware of one's shortcomings and limitations	6	0	0
aware of what you don't know, and not hiding it	6	0	0
being other people's equal	6	0	0
being happy to be part of a conversation, not its center	6	0	0
ever ready to learn	6	0	0
happy with the way my attitude makes me feel and look	6	0	0
having nothing to pretend	6	0	0
knowing where your worth lies	6	0	0
not given to feelings of superiority	6	0	0
not given to overstatement of one's own achievements	6	0	0
not having an ego	6	0	0
not trying to seem better than others	6	0	0
strong sense of self-esteem	6	0	0
understanding one's limitations	6	0	0
valuing others' virtues	6	0	0
allowing space for others	5	1	0
allowing that one might be mistaken	5	1	0
ever ready to revise positions	5	1	0
hopeful that others will learn to look at themselves in the same way	5	1	0
not blowing one's own trumpet	5	1	0
noticing without alarm changes over time	5	0	1
noticing without alarm changes in aging	5	0	1
strong, not weak	5	1	0
team player	5	1	0

Short Phrase	Appreciative Humility	Self-Abasing Humility	Neither
Appreciative Humility (cont'd)			
willing to defer to others	5	1	0
risking one's own space and power	4	0	2
Self-Abasing Humility			
being embarrassed by someone else singing one's praises	0	6	0
fearful of being a doormat	0	6	0
lacking confidence	0	6	0
not aware of one's importance	0	6	0
small in comparison with others	0	6	0
lacking standing	0	5	1
not seen by others	1	3	2
Both Forms of Humility			
not speaking of own performance	3	3	0
Neither			
not in history books	2	1	3

Note:

Entries in the columns “Appreciative Humility”, “Self-Abasing Humility” and “Neither” refer to the number of coders (out of 6) who categorized the phrase as best describing each form of humility (or as describing neither of the two forms). For example, the final entry indicates that the phrase “not in history books” was viewed by 2 coders as best capturing appreciative humility, by 1 coder as best capturing self-abasing humility, and by 3 coders as capturing neither form of humility.

Dark blue phrases were categorized as appreciative humility by 5 or 6 coders.

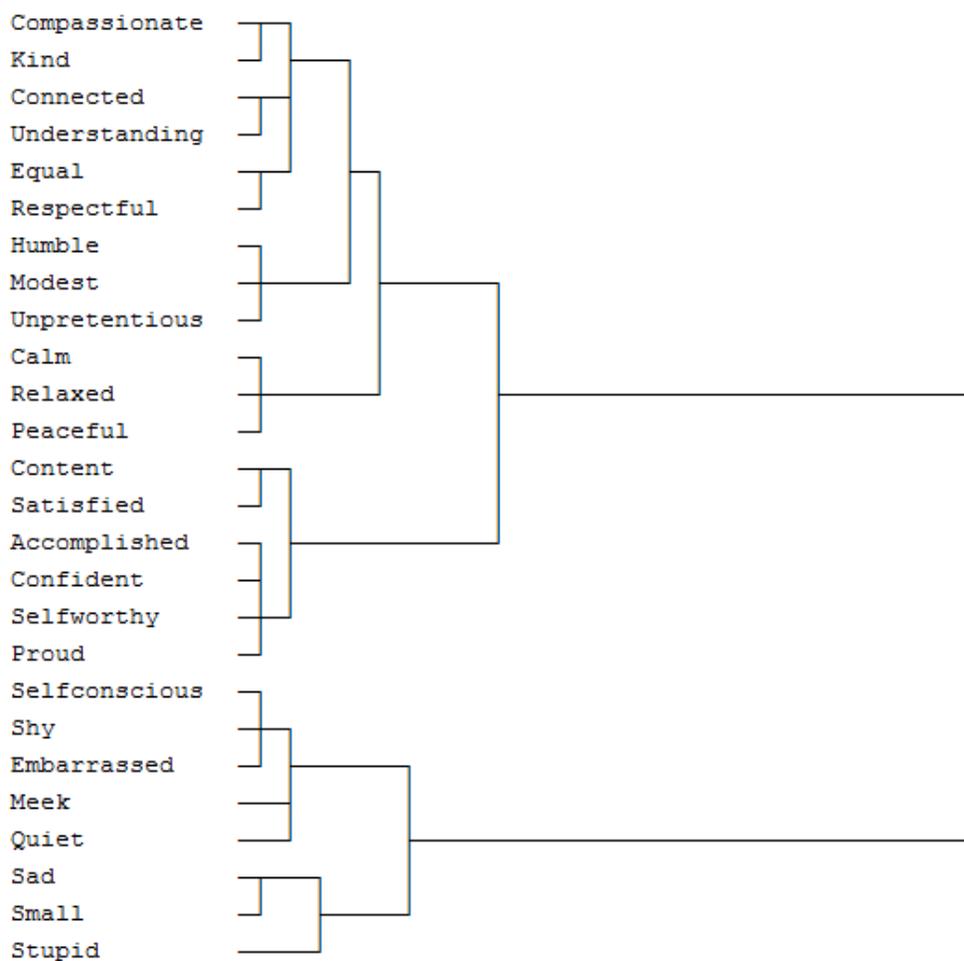
Dark green phrases were categorized as self-abasing humility by 5 or 6 coders.

Light blue phrases were categorized as appreciative humility by 3 or 4 coders.

Light green phrases were categorized as self-abasing humility by 3 or 4 coders.

The entry “not speaking of own performance” is colored both light blue and light green because it was categorized as best describing appreciative humility and self-abasing humility by three coders each

Figure 2: Dendrogram depicting the hierarchical structure of humility-related words (Study 1)



Chapter 3: The unsung benefits of material things: Material purchases provide more frequent momentary happiness than experiential purchases

Not surprisingly, given its origins in the construct validation literature, the two-stage process presented in Chapter 1 is most typically used as a lens through which to view work on a single construct, describing how that construct iterates through periods in which it is defined, measured, and then vetted by the larger research community. However, the same two-stage process can be useful in understanding the literature on a specific research question, in which case the focus is on the foundational definition and measurement assumptions that guide research on the question (Stage 1), the nature of the empirical findings stemming from that initial definition and measurement strategy (Stage 2), and the broader research community's subsequent efforts to refine the definition and measurement assumptions to gain new insight into the research question (iteration back to Stage 1). In line with this outline, Chapter 3 will use the two-stage process as a lens through which to view research into one specific research question: Does spending money on life experiences or material things bring more happiness?

With respect to Stage 1, researchers interested in the answer to this question have with near uniformity defined and measured happiness as tantamount to *afterglow happiness*, or happiness experienced while reflecting back on the prior consumption of an experiential or material purchase (Dunn & Weidman, 2015). This involves asking people to reflect on a past experiential or material purchase, and to endorse items such as “When you think about this purchase, how happy does it make you?” and “How much does this purchase contribute to your happiness in life?” (e.g., van Boven & Gilovich, 2003). With respect to Stage 2, over a decade of research defining and measuring happiness in this manner has documented the experiential

advantage: individuals derive more happiness from experiential purchases—events that they personally encounter or live through, such as vacations or concerts—than material purchases, or tangible objects that people obtain and keep in their possession, such as sweaters and couches (e.g., Howell & Hill, 2009; Kumar, Killingsworth, & Gilovich, 2014, van Boven & Gilovich, 2003; for reviews, see Dunn & Norton, 2013; Gilovich, Kumar, & Jampol, 2015).

The goal of Chapter 3 of this dissertation is to describe one endeavor representing an iteration of the experiential advantage research back to Stage 1. At first glance, it may seem surprising that the field would need to revise its definition and measurement of happiness to gain additional insight into the types of purchases that are most likely to increase it; after all, isn't *happiness* a straightforward construct with an obvious meaning? Yet, prior theory suggests the possibility that happiness may come in multiple distinct forms, including momentary happiness (i.e., happiness *in your life*) as well as afterglow happiness (i.e., happiness *about your life*; Kahneman, 2010). Individual's evaluations of these two forms of happiness often differ; whereas individuals rely on experiential knowledge when reporting momentary happiness, they rely on episodic memory and semantic knowledge when reporting afterglow happiness (Robinson & Clore, 2002b). Reliance on these latter two knowledge stores involves drawing on cognitive schemas and beliefs about emotions, which may divorce resulting reports of happiness from one's actual experience (Robinson & Clore, 2002a). In the context of purchases, these two forms of happiness map onto the distinction the pleasure people feel while actually consuming a purchase (momentary happiness) and the pleasure people feel when looking back on a purchase; afterglow happiness; Dunn & Weidman, 2015). The vast majority of prior work on the experiential advantage has, however, defined and measured afterglow happiness, to the near-complete exclusion of momentary happiness (though one recent study also defined and measured

anticipatory happiness, or happiness experienced when looking forward to a subsequent purchase; Kumar et al., 2014). Specifically, only two studies have examined momentary happiness while participants were consuming a purchase, and these studies examined enjoyment of extremely cheap purchases at a single time point in a laboratory setting (e.g., a bag of chips or a pen; Carter & Gilovich, 2010, Study 4; Nicolao, Irwin, & Goodman, 2009, Study 3).

Importantly, when momentary happiness is examined over many time points outside of the lab, material purchases may look better than in studies of afterglow happiness, for the simple reason that they may be consumed for a longer period of time than experiential purchases. The most popular experiential purchases reported in past research (e.g., tickets to events; travel; dining; Howell & Hill, 2009; van Boven & Gilovich, 2003) typically involve just one consumption occasion, whereas the most popular material purchases (e.g., clothing and jewellery; televisions and computers) typically allow for repeated enjoyment over time. Supporting this finding, people retrospectively report having spent many more days consuming material than experiential gifts they received (Chan & Mogilner, 2015). Material (vs. experiential) purchases therefore may allow for more frequent momentary happiness over time, even if experiential purchases provide more intense momentary happiness during specific instances in which they are enjoyed. Yet, research suggests that frequency may have little bearing on people's reports of afterglow happiness; people often do not take the length of an event into account when reporting their cumulative feelings during that event, instead relying primarily on the intensity of peak feelings (e.g., Fredrickson & Kahneman, 1993; Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993; Redelmeier & Kahneman, 1996). Material purchases are therefore likely to compare more favorably to experiential purchases when considering momentary happiness than when considering afterglow happiness, which points to

the importance of iterating back to Stage 1 of the measurement-theory cycle to re-examine the experiential advantage while defining and measuring momentary happiness.

In Chapter 3, we will test whether defining and measuring *momentary happiness*—as opposed to *afterglow happiness*—will change the nature of the relationship between spending and well-being. In Study 1, we gave participants \$20 to spend on an experiential or material purchase of their choice, and in Study 2, we assigned participants to report one experiential or material gift they had received during the holidays. We then tracked participants' happiness across two weeks via daily-diary (Study 1) and experience-sampling (Study 2) methodologies. We predicted that experiential and material purchases would provide momentary happiness via two distinct routes: material purchases would provide greater *frequency* of momentary happiness, whereas experiential purchases would provide greater *intensity* of momentary happiness.

In accordance with recommended research practices in psychological science, raw data sets and all materials for both studies, and pre-registered predictions for Study 1, are publicly available online at the Open Science Framework (OSF; Study 1 available at osf.io/ixgas; Study 2 is available at osf.io/p2fvg). Results from a pilot study are also posted on the OSF. Following recommendations by Simmons, Nelson, and Simonsohn (2011), we report all measures, conditions, data exclusions, and how we determined our sample sizes.

3.1 Study 1

3.1.1 Method

3.1.1.1 Participants

Participants were 67 undergraduates who received partial course credit ($M_{\text{age}}=19.67$; $SD=1.99$; 81% female; 55% East Asian, 18% Caucasian; 15% South Asian; 12% Other). We arrived at this sample size by running as many participants as we could within the budget

provided by a research grant to the first author. This sample size would yield 80% power to detect an effect size of $d=.70$ for a between-subjects analysis; for our within-subjects analyses—which involved 238 individual responses nested within participants—statistical power would be higher to the extent that these responses provide unique information (Scherbaum & Ferrer, 2009). The between-subjects power analysis therefore represents a conservative estimate.

3.1.1.2 Procedure

The study involved three parts. First, participants partook in an initial lab session, in which they completed the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999), which assesses individuals' tendency to view themselves as a happy person ($\alpha=.81$).¹⁶ Participants were then told that they would receive \$20 to spend on a purchase of their choice that was meant to advance their happiness, which they could enjoy at some time during the subsequent two weeks. They were asked to make the purchase the following day. Participants were randomly assigned to make either an experiential or material purchase, defined on participants' questionnaires following van Boven and Gilovich (2003). Participants only saw the definition for their purchase type, and were unaware that we were comparing different purchase types.

Second, beginning the following day, participants were asked to complete nightly online questionnaires for two weeks. These questionnaires included two sets of questions—one set each for momentary and afterglow happiness. For momentary happiness, participants were first asked whether they partook in the life experience (experiential condition) or used the material possession (material condition) associated with their purchase on that day. If participants answered no to this question, they received no further questions for momentary happiness. If

¹⁶ Dispositional happiness did not systematically vary across conditions in Study 1 nor Study 2 ($ps > .75$), and is not discussed further.

participants answered yes to this question, they were asked to write a description of the specific occasion that day when they were [partaking in the life experience/using the material object], and were then asked to report how happy they were during this occasion on a five-point scale (1=*not at all*; 5=*extremely*), along with one other exploratory measure (see osf.io/ixgas). For afterglow happiness, these questions were identical, except they referred to reminiscing about the purchases.

Third, 1-3 days after submitting the final nightly questionnaire, participants completed two items assessing their afterglow enjoyment of their purchase (item 1: *When you think about this purchase, how happy does it make you?*; item 2: *How much does this purchase contribute to your overall happiness in life?*; van Boven & Gilovich, 2003); these items were averaged to form a composite ($\alpha=.72$). Fourth, approximately one month later, participants were contacted via email, and asked to report the number of days on which they had enjoyed their gifts since the study ended, plus one other exploratory measure (see osf.io/ixgas).

3.1.2 Results

3.1.2.1 Response rates

Participants recorded 846 responses (90% completion; experiential=92%; material=88%), 238 of which involved deriving some enjoyment from purchases.¹⁷ Additionally, 41 participants (61%) responded to the one-month follow-up survey (experiential=55%; material=68%); participants who did and did not complete the follow up did not significantly differ on the SHS ($M_{Yes}=4.77$, $SD=1.03$; $M_{No} = 5.08$, $SD=.83$; $p=.19$).

¹⁷ Eight individual occasions of momentary consumption or reminiscing (2%) were recoded as instances of non-consumption or non-reminiscing, given that participants' descriptions of these occasions indicated that they did not involve consumption. These excluded cases were approximately equally distributed across condition (experiential=5; material=3) and purchase phase (momentary=3; reminiscing=5).

3.1.2.2 Purchases

Participants' purchases are displayed in Table S1. We also created a continuous score of the experiential or material nature of each purchase; undergraduate and graduate students rated the extent to which each purchase could be considered a life experience or a material object on a five-point scale (1=*purely a life experience*; 5=*purely a material object*), based on the definitions of experiential and material purchases provided in van Boven and Gilovich (2003). We excluded participants from the experiential condition whose purchases received average scores of greater than 4 ($n=2$), and participants from the material condition whose purchases received average scores of less than 2 ($n=1$).

3.1.2.3 Analytic strategy

For both momentary and afterglow happiness, we examined the relationship between condition (material vs. experiential) and the frequency and intensity of happiness participants experienced. Following Schimmack and Diener (1997), *frequency* of momentary happiness was defined as the number of days during which each participant reported deriving at least some happiness while consuming their purchase (i.e., scores between 2-5); given that participants provided an unequal number of responses, for each participant, we divided the total number of happiness days by the total number of responses, yielding a percentage. *Intensity* of momentary happiness was defined as the level of happiness reported across all occasions included in this frequency count. For analyses involving intensity of momentary happiness, we conducted multilevel modeling, given that each happiness report was nested within a participant; in these analyses, condition was treated as a level-two predictor.

Across both Studies 1 and 2, for analyses regarding frequency of momentary happiness, we report medians and p -values from Mann-Whitney U tests in text, given the substantial

skewness of these variables. Complete statistical information, including means, standard deviations, traditional inference tests, effect sizes, confidence intervals, and relations between our dependent variables and the continuous purchase score, are reported in Tables 1 -4. Analyses involving continuous purchase score were conceptually identical to those involving between-condition comparisons.

3.1.2.4 Frequency of momentary happiness

Across two weeks, participants derived more frequent momentary happiness from material purchases than experiential purchases ($\text{Median}_{\text{Mat}} = 38\%$ of responses; $\text{Median}_{\text{Exp}} = 10\%$; $p < .01$; $d = .88$; see Figure 2), corresponding to a median of 3 days for each material purchase, compared to only 1 day for each experiential purchase. Additionally, when contacted at the one-month follow-up, participants reported having enjoyed material purchases more frequently than experiential purchases since the study ended ($\text{Median}_{\text{Mat}} = 8.5$ days; $\text{Median}_{\text{Exp}} = 0$ days; $p < .001$).

3.1.2.5 Intensity of momentary happiness

Across individual instances of enjoyment, participants consuming experiential and material purchases did not significantly differ in the average intensity of momentary happiness ($M_{\text{Mat}} = 3.39$; $M_{\text{Exp}} = 3.61$; $b = .26$, $p = .13$; see Figure 3).

3.1.2.6 Afterglow happiness

Participants did not differ in frequency ($\text{Median}_{\text{Mat}} = 14\%$ of responses, and 1 day; $\text{Median}_{\text{Exp}} = 15\%$, and 2 days; $p = .89$) or intensity ($M_{\text{Mat}} = 3.31$; $M_{\text{Exp}} = 3.43$; $p = .36$) of afterglow happiness during the two-week study period. Similarly, when asked at the final assessment to rate their *overall* afterglow happiness, participants in each condition reported similar levels ($M_{\text{Exp}} = 3.13$ vs. $M_{\text{Mat}} = 3.14$, $p = .97$).

3.1.3 Discussion

Over two weeks, participants derived more *frequent* momentary happiness from material purchases. In contrast, participants did not report more *intense* momentary happiness from experiential than material purchases, though the mean for experiential purchases was higher; this null finding should be interpreted with caution, however, given that study was not powered to detect small-to-medium effects. No differences were found between experiential and material purchases in the frequency or intensity of afterglow happiness; these null effects may be due to the fact that participants were asked to consider purchases consumed in the immediate past, whereas experiences typically are viewed more favorably in the distant past (Mitchell, Thompson, Peterson, & Cronk, 1997). In addition, given the low cost of the purchases, most purchases may have provided little afterglow happiness, limiting our ability to detect between-condition differences.

Study 1 suffered from several limitations, which we sought to address in Study 2. First, we cannot be certain that the happiness participants reported via nightly questionnaires corresponded to the average happiness participants experienced during the actual moments when they were consuming their purchases, rather than a peak moment of happiness. In Study 2, we therefore employed an experience-sampling methodology, in which participants repeatedly reported how much happiness they were deriving from their purchases in the present moment. Building on other recent work that has examined experiential versus material gifts (Chan & Mogilner, 2015), we capitalized on the Christmas season by asking participants to report their feelings 3-5 times per day (via text message) about a material or experiential gift they had received. By assessing happiness more than 50 times over a two-week period, Study 2 allowed

us to employ growth-curve modeling to examine the trajectory of momentary happiness over time, and whether this differed between experiential and material gifts.

Second, this method also enabled us to test whether our findings generalized to more expensive purchases than those made for under \$20 in Study 1; this is an important step to take before drawing strong conclusions, given that some of the most common and enjoyable experiential and material purchases (e.g., concerts, travel) tend to be more expensive. By asking participants to report on the gifts they received over the Christmas holiday, we were therefore able to overcome the constraints of lab budgets that typically prevent researchers from tracking momentary, day-to-day enjoyment of purchases that range in cost.

3.2 Study 2

3.2.1 Method

3.2.1.1 Participants

Participants were 81 undergraduates who received partial course credit (M age=19.94; SD =2.08; 64% female; 42% East Asian, 27% Caucasian, 11% Middle Eastern, 10% South Asian, 10% Other). Eighty-nine participants originally enrolled in the study, but eight dropped out prior to the experience-sampling period. We received feedback on an earlier draft of this manuscript on October 31, 2014, and, after obtaining ethics approval to employ an experience-sampling design, recruited as many participants as possible in the study before the end of the fall 2014 academic term (November 28, 2014). This sample size would yield 80% power to detect an effect size of $d=.63$ for a between-subjects comparison. As in Study 1, however, power for our within-subjects analyses—which involved 702 individual responses nested within participants—would likely have been considerably higher.

3.2.1.2 Procedure

The study involved three parts. First, participants completed an initial lab session in November, 2014, in which they completed the SHS ($\alpha=.87$), and an exploratory measure of dispositional materialism (see osf.io/p2fvg). Participants were randomly assigned to select one experiential or material gift they received, defined as in Study 1 (again, participants only saw one gift definition, and were not aware that we were comparing material and experiential gifts). Participants were told to choose from among the gifts they received over the holiday break, rather than asking for a gift to fit the definition provided; participants were told that, if they did not receive a gift in the correct category, to choose the gift that most closely corresponded to the provided definition of life experience or material object. Participants were instructed that there were no restrictions on the cost of their gift. Participants were then told that we would text them questions every day for two weeks over the upcoming Christmas break.

Second, beginning on Christmas Day, participants were sent 3-5 text messages per day for two weeks. Each text contained two questions. First, participants were asked “How much is your gift contributing to your happiness in life right now?” on a scale from 0 (none) to 5 (v. much).¹⁸ We chose this wording, rather than simply asking participants how happy they were, to more directly isolate the happiness being derived from the gift, rather than from extraneous factors. Second, participants were asked “Are you [experiencing/using] your gift right now?” and were asked to respond yes or no. For the second question, *experiencing* was used for the experiential condition, and *using* for the material condition.

Third, approximately one month after the conclusion of the texting period, participants completed a follow-up questionnaire via phone. Participants were asked the two questions

¹⁸ The scale labels were shortened from Study 1, so that they could fit into the character limits for the text messages. Additionally, due to experimenter error, the low scale endpoint was “0”, instead of “1”.

assessing afterglow happiness regarding their gifts, as in Study 1 (van Boven & Gilovich, 2003; $\alpha=.72$), along with other exploratory measures (see osf.io/p2fvg). Finally, participants estimated the cost of their gift.

3.2.2 Results

3.2.2.1 Response rates

Participants responded to a total of 3419 texts (77% response rate; experiential=79%; material=75%), 701 of which involved participants deriving some enjoyment from gifts. Additionally, 71 participants (88%) completed the follow-up assessment (experiential: 89%; material: 87%); participants who did and did not complete the follow up did not differ on the SHS ($M_{Yes}=4.71, SD=1.13; M_{No} = 4.50, SD=.98; p=.59$).

3.2.2.2 Gifts

Participants' gifts are displayed in Table S2. We again created a continuous score of the experiential or material nature of each gift, and excluded participants from the experiential condition whose gifts received average scores of greater than 4 ($n=8$), and participants from the material condition whose gifts received average scores of less than 2 ($n=0$).

Importantly, gifts received in Study 2 were substantially more expensive than purchases made in Study 1; of the 71 participants who completed the follow-up assessment, gift cost ranged from \$5-\$3,000 ($M=\$327.25$; Median=\$150; $SD=\$528.21$); median cost did not differ between-conditions (Experiential=\$175; Material=\$150; Table S2).

3.2.2.3 Analytic strategy

As in Study 1, we compared the frequency and intensity of happiness participants experienced between-conditions (material vs. experiential). *Frequency* of momentary happiness was again defined as the number of occasions during which participants reported deriving at least

some happiness from consuming their gift (i.e., scores from 1-5), divided by the total number of texts to which participants responded, and *intensity* of momentary happiness was again defined as the level of happiness reported across all occasions included in the frequency count. All reported analyses held when controlling for gift cost.

3.2.2.4 Frequency of momentary happiness

Across two weeks, participants reported enjoying material gifts more frequently than experiential gifts (Median_{Mat}= 21% of texts; Median_{Exp}=and 4%; $p<.01$; $d=.40$; see Figure 2), corresponding to a median of 9 texts for each material purchase, and only 2 texts for each experiential purchase. Similarly, participants enjoyed material gifts more frequently than experiential gifts in the month after the study ended (Median_{Mat}=17 days; Median_{Exp}=0 days, $p<.001$; $d=1.54$).

3.2.2.5 Intensity of momentary happiness

Across individual consumption occasions, participants reported higher average happiness during each moment of enjoyment for experiential gifts ($M=4.21$) than material gifts ($M=3.43$; $b=.80$, $p<.01$; see Figure 3).¹⁹

3.2.2.6 Momentary happiness over time

To examine whether intensity of momentary happiness changed over time, we performed growth curve modeling using multilevel modeling (Singer & Willett, 2003). Intensity of momentary happiness was regressed on a continuous variable that represented the number of hours that had elapsed between the beginning of the study and the participant's happiness response; this yielded a linear slope for each participant's happiness across the two-week

¹⁹ Participants sometimes reported a number greater than zero to the question of how much happiness they were currently receiving from their gift, despite responding *no* to the question of whether they were currently experiencing/using their gift. Average happiness did not differ between-conditions for these texts ($M_{Exp}=1.00$, $M_{Mat}=1.13$; $b=.08$; $p=.81$).

sampling period, allowing us to examine the average slope across the entire sample.

Additionally, condition was entered as a level-two variable, as well as the interaction between the hours-elapsed variable and condition, allowing us to examine whether the average slope differed by gift type. On average, happiness decreased with each hour elapsed ($b=-.001$, $SE=.0005$, $z=2.49$, $p=.02$), but this effect was not moderated by gift type ($b=.001$, $SE=.0014$, $z=.94$, $p=.35$), suggesting that participants derived less happiness from their gifts over time, regardless of gift type.²⁰

3.2.2.7 Afterglow happiness

In contrast to Study 1, participants reported more overall afterglow happiness regarding experiential than material gifts at the follow-up assessment ($M_{Exp}=3.15$; $M_{Mat}=2.37$; $p<.01$, $d=.81$). We further examined whether frequency and intensity of momentary happiness predicted reports of afterglow happiness at the one-month follow-up, by simultaneously regressing afterglow happiness on both the frequency and intensity indices. Intensity positively predicted afterglow happiness ($\beta=.53$, $p<.001$; $CI_{95}=[.31, .74]$), but frequency did not ($\beta=.10$, $p=.36$; $CI_{95}=[-.11, .31]$), suggesting that afterglow happiness was driven predominantly by how intensely—rather than how frequently—participants enjoyed their gifts.

3.2.3 Discussion

Replicating the findings of Study 1, over a two-week period, participants derived more *frequent* momentary happiness from material than experiential gifts—a trend that continued in the month following the study. In contrast to Study 1, however, participants also reported more *intense* momentary happiness from experiential than material gifts. Also in contrast to Study 1 and consistent with prior research, we found that participants derived greater afterglow happiness

²⁰ To test for non-linear declines in happiness, we re-ran our analyses with a negative quadratic and negative cubic term for hours elapsed, in separate models; neither term was significant ($ps>.28$) and neither term interacted with condition ($ps>.15$), suggesting that declines in happiness were linear.

from experiential than material gifts in the month following the study. Additionally, afterglow happiness was more strongly determined by intensity than frequency of momentary happiness.

3.3 General discussion

In contrast to the large body of research documenting the experiential advantage, the present research suggests that material and experiential purchases both provide happiness during consumption, but in reliably different flavors. Whereas experiential purchases provided more *intense* momentary happiness, material purchases provided more *frequent* momentary happiness over the course of two weeks. Although these findings were stronger in the more highly-powered Study 2, it is worth noting that the same general pattern of findings emerged across studies using daily-diary (Study 1) and experience-sampling (Study 2) methodologies, across studies in which purchases were relatively inexpensive (Study 1) and in which they ranged into the hundreds and thousands of dollars (Study 2), and regardless of whether participants made the purchases (Study 1) or received them as gifts (Study 2). Additionally, in line with previous research, participants in Study 2 reported deriving more afterglow happiness from experiential (vs. material) purchases. We further found that reports of afterglow happiness were predominantly driven by intensity, rather than frequency, of momentary happiness.

The strong link between intensity of momentary happiness and reports of afterglow happiness helps to account for previous demonstrations of the experiential advantage. Studies examining this phenomenon typically ask individuals to report current happiness with a past purchase (e.g., van Boven & Gilovich, 2003; Howell & Hill, 2009); our findings suggest that these reports may be driven largely by the intensity of positive feelings during consumption, rather than the frequency of positive feelings. People's reliance on intensity (vs. frequency) is likely to cause reports of afterglow happiness to appear superior for life experiences than

material objects, even if material objects provide more frequent bouts of momentary happiness over time. Therefore, although afterglow happiness provides genuine enjoyment, it does not always correspond to momentary happiness across time, highlighting the importance of studying momentary happiness in its own right.

3.3.1 Limitations and future directions

Our work has several limitations, leaving open intriguing avenues for future research. First, although we endeavored to track momentary happiness over an extended time period, pragmatic constraints limited this period to two weeks of intensive sampling. Given prior work suggesting that pleasure wanes over time (Frederick and Loewenstein, 1999), future research should track momentary happiness of purchases over months or years, to examine whether our findings generalize to longer time frames. By doing so, researchers could also measure people's feelings of happiness while they are actively reminiscing about their purchases, long after consumption has ended. Whereas our investigation showed that material (vs. experiential) purchases provided more frequent momentary happiness during consumption, it is possible that experiential purchases provide more frequent happiness during reminiscence. Second, although we captured a representative sample of moments in Study 2, it is possible that we did not capture some of the most pleasurable or displeasurable moments, due to factors such as inattentiveness (e.g., participants engrossed in an enjoyable experience may not have noticed a text message). The fact that response rates were equivalent across conditions, however, helps ameliorate this concern.

Third, it is possible that the happiness participants reported at any given assessment did not reflect the happiness they were receiving from their purchase (i.e., a participant could have been wearing a new pair of jeans, without necessarily attending to or deriving happiness from

those jeans). We attempted to minimize this problem in Study 2 by specifically asking participants to report how much their gifts were contributing to their happiness in life in any given moment. Importantly, our measure of *frequency* of momentary happiness included only those moments when participants were deriving some happiness from their purchases.

3.3.2 To do or to have?

What do these findings imply for the well-documented *experiential advantage*, or the suggestion that consumers who wish to maximize their happiness should spend money on life experiences, rather than material objects (Dunn & Norton, 2013; Gilovich et al., 2015; van Boven & Gilovich, 2003; van Boven, 2005)? We propose that the accuracy of this conclusion depends on the type of happiness one values. Specifically, if an individual wishes to maximize happiness while anticipating or reflecting on their consumption of a purchase, life experiences are clearly the best investments. When it comes to momentary happiness during consumption, experiential purchases may also be superior if one wants to maximize the intensity of pleasure in a given moment. However, material purchases have an unsung advantage, in that they provide more frequent bouts of momentary happiness in the weeks after they are acquired.

These findings raise the question of whether experiential or material purchases provided more *total* momentary happiness over two weeks. Across studies, participants reported about half a point higher intensity of happiness for experiential (vs. material) purchases, but derived happiness three to four times more often for material (vs. experiential) purchases over two weeks. Thus, simply summing all reports of momentary happiness across two weeks would point to the conclusion that material purchases provide more total momentary happiness than experiential purchases. Determining how frequency and intensity *should* be weighted, however, raises thorny philosophical issues. Individuals and cultures may place different relative value on

intensity vs. frequency of happiness. To the extent that people in increasingly prosperous countries such as China devote their newfound wealth to material things, research on the experiential advantage would point to the conclusion that increased prosperity may fail to yield increased happiness. If, however, people in China value low-arousal positive feelings (Tsai, 2007), the decision to buy material things may be optimal. Similarly, given that introverts (vs. extraverts) prefer to experience low-arousal pleasant feelings (Rusting & Larsen, 1995), these individuals might derive optimal happiness from consuming material purchases, rather than subjecting themselves to the intense thrills that often accompany life experiences.

To conclude, our findings suggest that the choice between material and experiential purchases inherently involves a trade-off between frequent and intense momentary happiness. When asking oneself “To Do or to Have?” (van Boven & Gilovich, 2003), the answer may hinge on whether one is seeking an intense but fleeting form of happiness that is accompanied by a rosy afterglow, or a more subtle frequent form of happiness that will endure for weeks or months.

Table 6: Descriptive statistics for primary variables (Study 1)

Report	Experiential	Material
Momentary phase		
Frequency (days)	Median = 1 <i>M</i> = 2.26 <i>SD</i> = 2.19	Median = 3 <i>M</i> = 4.09 <i>SD</i> = 2.88
Frequency (percent of responses)	Median = 10 <i>M</i> = 17 <i>SD</i> = 16	Median = 38 <i>M</i> = 35 <i>SD</i> = 24
Intensity	<i>M</i> = 3.61 <i>SD</i> = .78	<i>M</i> = 3.39 <i>SD</i> = .73
Usage (follow-up)	Median = 0 <i>M</i> = 1.13 <i>SD</i> = 1.82	Median = 8.5 <i>M</i> = 13.6 <i>SD</i> = 19.66
Reminiscing phase		
Frequency (days)	Median = 2 <i>M</i> = 2.32 <i>SD</i> = 2.31	Median = 1 <i>M</i> = 2.03 <i>SD</i> = 2.10
Frequency (percent of responses)	Median = 15 <i>M</i> = 18 <i>SD</i> = 17	Median = 14 <i>M</i> = 19 <i>SD</i> = 22
Intensity	<i>M</i> = 3.43 <i>SD</i> = .65	<i>M</i> = 3.31 <i>SD</i> = .78
Afterglow happiness	<i>M</i> = 3.13 <i>SD</i> = .85	<i>M</i> = 3.14 <i>SD</i> = .70

Note:

Frequency (days): Number of days during which participants reported deriving at least some happiness while consuming their purchase (i.e., scores between 2-5) (between-subjects)

Frequency (percent of responses): Percentage of days on which participants responded to our nightly questionnaires and reported deriving at least some happiness while consuming their purchase (i.e., scores between 2-5) (between-subjects)

Intensity: Mean level of happiness reported across all occasions included in the frequency count (within-subjects)

Usage (follow-up): Number of days in the month following the two-week daily sampling period during which participants reported having enjoyed their gifts (between-subjects)

Afterglow happiness: Measures taken at end of two-week daily sampling period (between-subjects)

Table 7: Descriptive statistics for primary variables (Study 2)

Report	Experiential	Material
Momentary phase		
Frequency (texts)	Median = 2 <i>M</i> = 5.86 <i>SD</i> = 8.75	Median = 9 <i>M</i> = 10.58 <i>SD</i> = 8.51
Frequency (percentage of responses)	Median = 04 <i>M</i> = 18 <i>SD</i> = 25	Median = 21 <i>M</i> = 28 <i>SD</i> = 25
Intensity	<i>M</i> = 4.21 <i>SD</i> = 1.01	<i>M</i> = 3.43 <i>SD</i> = 1.11
Usage (follow-up)	Median = 0 <i>M</i> = 2.04 <i>SD</i> = 4.85	Median = 17 <i>M</i> = 17.49 <i>SD</i> = 12.14
Reminiscing phase		
Afterglow happiness	<i>M</i> = 3.15 <i>SD</i> = 1.15 Median = 3	<i>M</i> = 2.37 <i>SD</i> = .84 Median = 5
Reminiscing (follow-up)	<i>M</i> = 5.95 <i>SD</i> = 5.61	<i>M</i> = 5.87 <i>SD</i> = 3.66
Reminiscing happiness	<i>M</i> = 3.32 <i>SD</i> = .95	<i>M</i> = 2.87 <i>SD</i> = .83

Note:

Frequency (texts): Number of occasions during which participants reported deriving at least some happiness while consuming their purchase (i.e., scores between 1-5) (between-subjects)

Frequency (percentage of responses): Percentage of occasions on which participants responded to a text message and reported deriving at least some happiness while consuming their purchase (i.e., scores between 1-5) (between-subjects)

Intensity: Mean happiness reported across all occasions included in the frequency count (within-subjects)

Usage (follow-up): Number of days in the month following the two-week daily sampling period during which participants reported having enjoyed their gifts (between-subjects)

Afterglow happiness: Measures taken at end of two-week daily sampling period (between-subjects).

Reminiscing (follow-up): Number of days in the month following the two-week daily sampling period during which participants reported having reminisced about their gifts (for those participants who reported reminiscing; between-subjects)

Reminiscing happiness: Mean happiness reported at one specific reminiscing occasion that participants were asked to report (between-subjects)

Table 8: Inferential statistics for primary variables (Study 1)

Report	Mann-Whitney <i>U</i> test: Between conditions	Parametric test: Between conditions	Relation with purchase score
Momentary phase			
Frequency (days)	$z = 3.04, p < .01$	$t(59) = 2.88, p < .01$ $d = .71, CI_{95} = .21, 1.22$	$r = .48, p < .001$
Frequency (percent of responses)	$z = 3.03, p < .01$	$t(56) = 3.50, p < .01$ $d = .87, CI_{95} = .36, 1.39$	$r = .46, p < .001$
Intensity	--	$t(62) = 1.52, p = .13$ $b = -.26^a, CI_{95} = -.59, .07$	$t(65) = 3.52, p < .001$ $b = -.29^a, CI_{95} = -.45, -.13$
Usage (follow-up)	$z = 4.18, p < .001$	$t(19)^b = 2.82, p = .01$ $d = .85, CI_{95} = .16, 1.53$	$r = .50, p < .01$
Reminiscing phase			
Frequency (days)	$z = .59, p = .56$	$t(62) = .53, p = .60$ $d = -.13, CI_{95} = -.62, .36$	$r = -.05, p = .70$
Frequency (percent of responses)	$z = .14, p = .89$	$t(62) = .25, p = .80$ $d = .05, CI_{95} = -.44, .54$	$r = -.03, p = .82$
Intensity	--	$t(50) = .93, p = .36$ $b = -.12^a, CI_{95} = -.37, .13$	$t(53) = 2.31, p = .02$ $b = -.15^a, CI_{95} = -.27, -.02$
Afterglow happiness	--	$t(60) = .04, p = .97$ $d = .01, CI_{95} = -.49, .51$	$r = -.04, p = .78$

Note: Positive relations indicate higher values for material (vs. experiential) purchases

CI_{95} = 95% confidence interval for standardized effect size

^a Unstandardized regression coefficient calculated using multilevel modeling

^b Degrees of freedom calculated using Welch's formula in the presence of unequal group variances

Relations with purchase score: Positive values indicate that higher numbers are associated with purchases seen as material objects

Frequency (days): Number of days during which participants reported deriving at least some happiness while consuming their purchase (i.e., scores between 2-5) (between-subjects)

Frequency (percent of responses): Percentage of days on which participants responded to our nightly questionnaires and reported deriving at least some happiness while consuming their purchase (i.e., scores between 2-5) (between-subjects)

Intensity: Mean level of happiness reported across all occasions included in the frequency count (within-subjects)

Usage (follow-up): Number of days in the month following the two-week daily sampling period during which participants reported having enjoyed their gifts (between-subjects)

Afterglow happiness: Measures taken at end of two-week daily sampling period (between-subjects)

Table 9: Inferential statistics for primary variables (Study 2)

Report	Mann-Whitney <i>U</i> test: Between conditions	Parametric test: Between conditions	Relation with purchase score
Momentary phase			
Frequency (texts)	$z = 3.26, p < .01$	$t(71) = 2.28, p = .03$ $d = .55, CI_{95} = .07, 1.03$	$r = .12, p = .28$
Frequency (percentage of responses)	$z = 2.75, p < .01$	$t(71) = 1.67, p = .10$ $d = .40, CI_{95} = -.08, .88$	$r = .06, p = .59$
Intensity	--	$t(64) = 3.37, p < .01$ $b = -.80^a, CI_{95} = -1.26, -.33$	$t(72) = 3.11, p < .01$ $b = -.30^a, CI_{95} = -.49, -.11$
Usage (follow-up)	$z = 5.02, p < .001$	$t(54) = 7.08, p < .001$ $d = 1.54, CI_{95} = .96, 2.12$	$r = .58, p < .001$
Reminiscing phase			
Afterglow happiness	--	$t(38)^b = 2.87, p < .01$ $d = -.81, CI_{95} = -1.33, -.28$	$r = -.32, p < .01$
Reminiscing (follow-up)	$z = .84, p = .40$	$t(32)^b = .05, p = .96$ $d = .02, CI_{95} = -.66, .69$	$r = -.08, p = .63$
Reminiscing happiness	--	$t(32)^b = 1.45, p = .16$ $d = -.50, CI_{95} = -1.19, -.19$	$r = -.32, p = .06$

Note:

Positive relations indicate higher values for material (vs. experiential) purchases

CI_{95} = 95% confidence interval for standardized effect size

^a Unstandardized regression coefficient calculated using multilevel modeling

^b Degrees of freedom calculated using Welch's formula in the presence of unequal group variances

Relations with purchase score: Positive values indicate that higher numbers are associated with purchases seen as material objects
Frequency (texts): Number of occasions during which participants reported deriving at least some happiness while consuming their purchase (i.e., scores between 1-5) (between-subjects)

Frequency (percentage of responses): Percentage of occasions on which participants responded to a text message and reported deriving at least some happiness while consuming their purchase (i.e., scores between 1-5) (between-subjects)

Intensity: Mean happiness reported across all occasions included in the frequency count (within-subjects)

Usage (follow-up): Number of days in the month following the two-week daily sampling period during which participants reported having enjoyed their gifts (between-subjects)

Afterglow happiness: Measures taken at end of two-week daily sampling period (between-subjects).

Reminiscing (follow-up): Number of days in the month following the two-week daily sampling period during which participants reported having reminisced about their gifts (for those participants who reported reminiscing; between-subjects)

Reminiscing happiness: Mean happiness reported at one specific reminiscing occasion that participants were asked to report (between-subjects)

Figure 3: Different types of happiness for a purchase

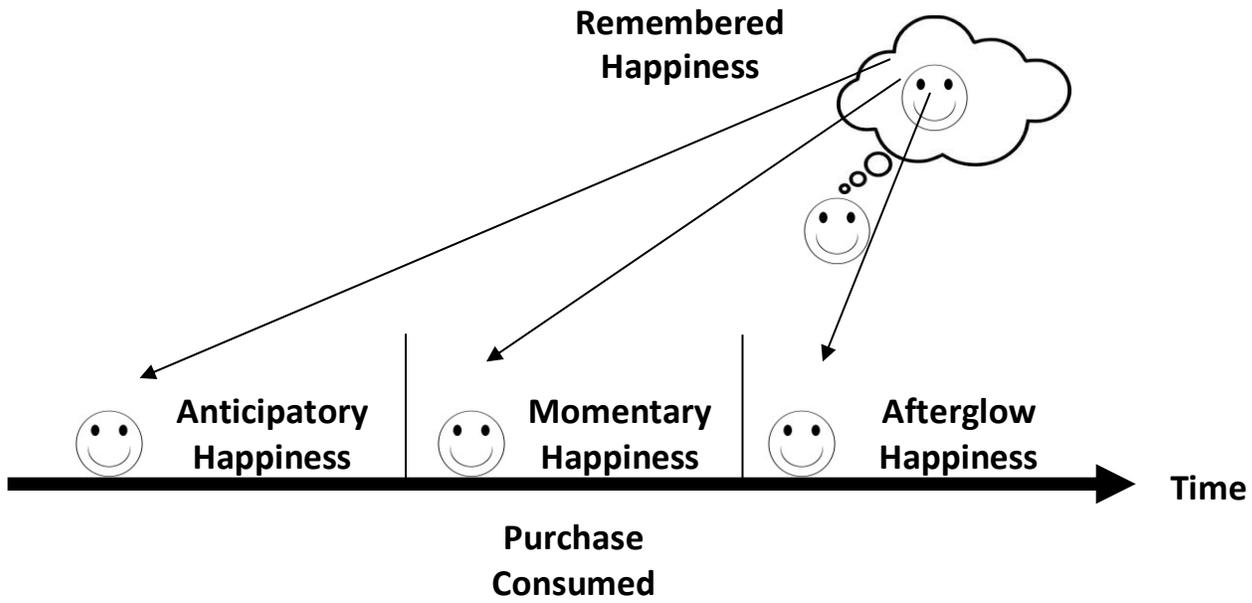
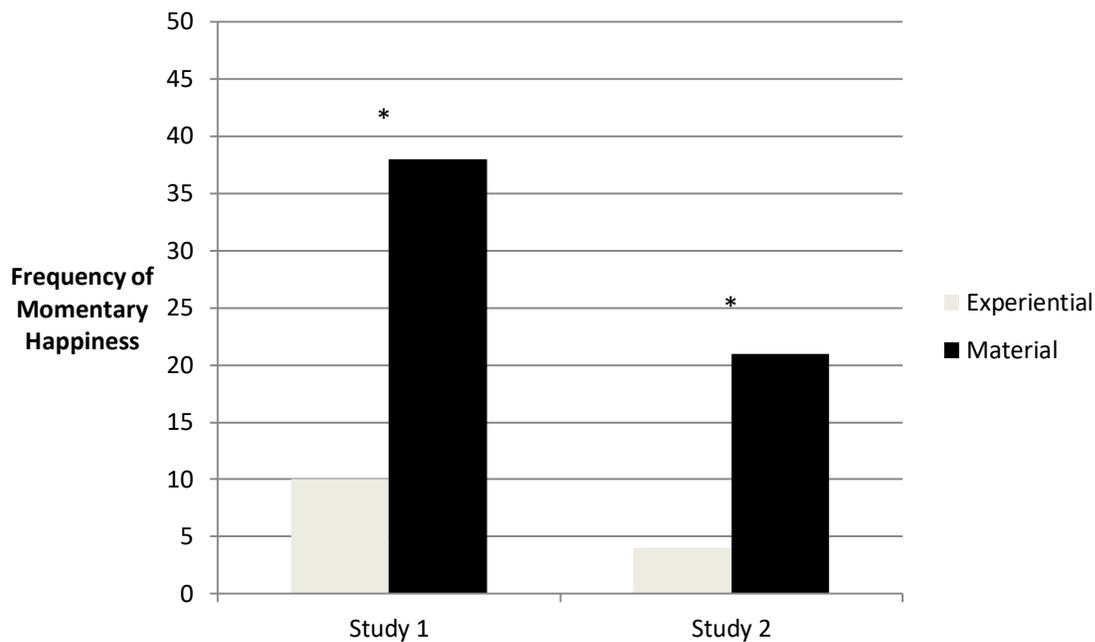
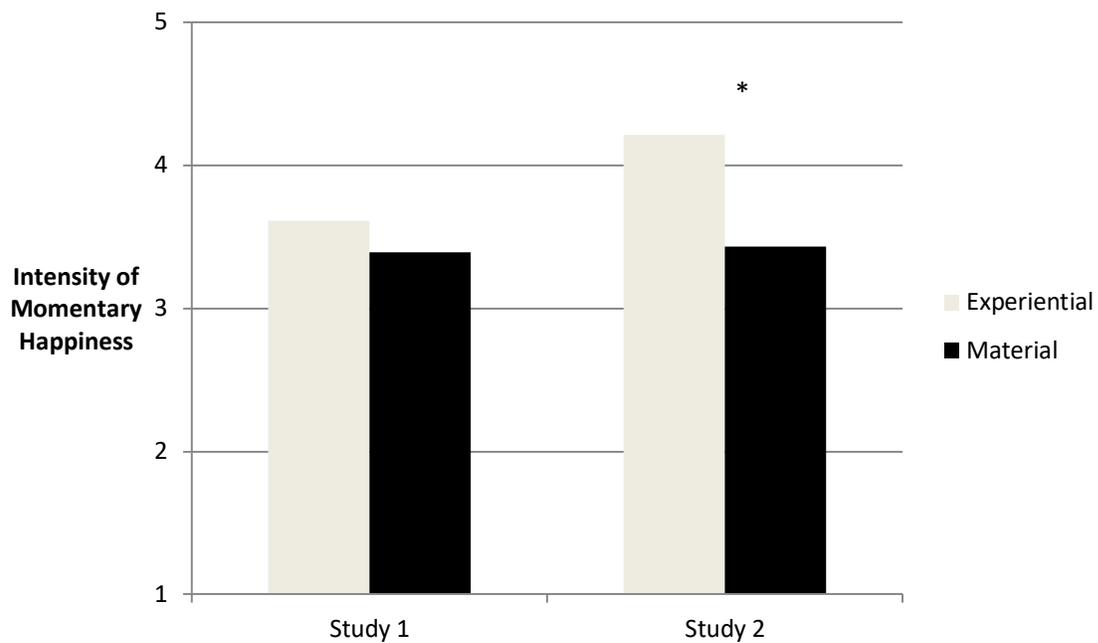


Figure 4: Frequency of momentary happiness (Studies 1 and 2)

Note: Frequency represents the median percentage of occasions on which participants reported deriving at least some happiness while consuming their purchase. Frequency represents the percentage of days in Study 1, and the percentage of text messages in Study 2.

Figure 5: Intensity of momentary happiness (Studies 1 and 2)

Note: Intensity represents the mean level of happiness reported across all instances during which participants reported enjoying their gifts during the two-week study period.

Chapter 4: Picking up good vibrations: Delineating the full range of pleasant distinct emotions

Since the turn of the century, there has been a considerable increase in psychological research on the subjective experience of distinct positive emotions. Whereas the large majority of prior work had focused on general positive affect or mood (e.g., Forgas, 1995; Fredrickson, 1998; Isen, 2000; Larsen, 2000; Russell & Barrett, 1999; Schwarz, 1990; Watson, Wiese, Vaidya, & Tellegen, 1999), in recent years affective scientists shifted their attention to more distinct states. Current studies have explored the causes and consequences of distinct positive emotions such as admiration (e.g., Sweetman, Spears, Livingstone, & Manstead, 2013; van de Ven, Zeelenberg, & Pieters, 2011), awe (e.g., Piff, Dietze, Feinberg, Stancato, & Keltner, 2015; Valdesolo & Graham, 2014), compassion (e.g., Goetz, Keltner, & Simon-Thomas, 2010; Oveis, Horberg, & Keltner, 2010), empathy (e.g., Wondra & Ellsworth, 2015; Zaki, 2014), gratitude (e.g., Algoe, Fredrickson, & Gable, 2013; Bartlett & DeSteno, 2006), love (e.g., Chan, Tong, Tan, & Koh, 2013; Gonzaga, Turner, Keltner, Campos, & Altemus, 2006), pride (e.g., Tracy & Robins, 2007; Williams & DeSteno, 2008), schadenfreude (e.g., Greitemeyer, Osswald, & Brauer, 2010; van Dijk, van Koningsbruggen, Ouwerkerk, & Wesseling, 2011), and tenderness (e.g., Buckels et al., 2015; Lishner, Batson, & Huss, 2011). Indeed, a recent quantitative review observed that affective scientists have studied more than 30 distinct positive emotions over the past decade (Weidman et al., in press). This trend culminated in the 2014 publication of the *Handbook of Positive Emotions* (Tugade, Shiota, & Kirby, 2014), an authoritative volume that included eight chapters dedicated to reviewing work on one distinct positive emotion each.

Despite the increasing popularity of studying subjectively experienced distinct positive emotions with self-report questionnaires, to date the field has not proceeded through the two-stage measurement-theory process in a typical manner, for two reasons. First, although the initial pass through Stage 1 involved numerous attempts to formulate theory-based definitions of various positive emotions, these often-rich and complex definitions were by and large not translated into accompanying measurement tools that captured the nuanced set of components thought to comprise each distinct positive emotion.²¹ Instead, researchers have largely relied on ad-hoc, single-item self-report scales to measure distinct positive emotions, which do not adequately capture the complex subjective experience of each emotion, and whose frequent use leads purportedly distinct positive emotions to be measured in inconsistent and overlapping ways across studies. Second, despite the fact that a reliance on ad-hoc, single-item measures hinders the substantial empirical efforts being poured into positive emotions—as evidenced by the extensive list of citations above—the field has not iterated back to Stage 1 of the cycle to construct self-report assessment tools to match the complexity and distinctiveness outlined in previously outlined theoretical definitions.

Taken together, all of this suggests that, despite the increasing popularity of distinct positive emotions research, the field has not undergone a complete initial trip through Stage 1 of the measurement-theory research cycle, nor has it adequately iterated back to Stage 1 after its initial pass through Stage 2. In light of the problematic consequences of this failure to iterate outlined above—and, more broadly, the half-century of evidence from the construct validation literature suggesting that complete iteration through the two-stage process is crucial to the health

²¹ The two exceptions to this rule are a recent research endeavor by Harmon-Jones and colleagues (2016), which involved creating self-report scales to measure several momentary distinct emotions, including one positive emotion, happiness, as well as a set of studies by Tracy and Robins (2007) which involved constructing a self-report measurement tool for pride based on an analysis of lay-persons' experience of that emotion.

of any subfield—it would be reasonable to conclude that research representing iteration back to Stage 1 for distinct positive emotions could be highly beneficial. The goal of Chapter 4 is to conduct this research, filling the current measurement void in the field by constructing self-report scales that can be used to assess each momentary distinct positive emotion in its full complexity and in a consistent and distinctive manner across studies.

Although the research presented in Chapter 4 will therefore appear broadly similar to the Stage 1 research described in Chapter 1 and throughout this dissertation, one important difference is worth noting: Whereas Stage 1 typically involves deriving a theory-based definition of a construct, and using this definition as the basis for developing a self-report scale, in Chapter 4 we will instead develop *empirically-based* definitions of each positive emotion, and use these as the bases for constructing self-report measurement tools. Specifically, whereas researchers such as Iris Mauss and June Tangney scoured the existing literature related to valuing happiness, shame, and guilt, and used clues from this literature as guiding principles when defining each construct and constructing self-report measures, in Chapter 4 we will instead rely primarily on an empirical, exploratory survey of lay-person experience of positive emotions to generate the various components that define these emotions, and that are best used to measure them.

There are several reasons why we will be eschewing theory for a more bottom-up approach. First, positive emotions—and emotions more broadly—are inherently subjective, intrapsychic experiences; it therefore seems ideal if not outright necessary to ask lay persons what thoughts, feelings, and behavioral action tendencies they experience during episodes of each positive emotion, before attempting to compose a formal definition, or construct a measurement tool, for each emotion. Second, positive emotions can take the form of complex, prototype-like experiences that are comprised of a variety of superficially distinct thoughts,

feelings, and behavioral action tendencies across contexts; it is therefore important to first gather a broad and diverse set of components from a large sample of lay persons' experiences of each emotion, before settling on a more concise set of components to use when formulating a definition and constructing a measurement tool for each emotion. Taking all of this together, it could be construed as foolish to try to define a distinct positive emotion using a top-down, theoretical stance, given that the complexity of emotions in general makes it extremely unlikely that we (or any other small team of researchers) could know with any certainty of the entire body of thoughts, feelings, and behavioral action tendencies that make up any given emotion.

When constructing these bottom-up, empirically derived measurement tools based on lay experience in Chapter 4, we also had the goal of beginning to develop a comprehensive taxonomy of subjectively experienced distinct positive emotions, or an understanding of exactly how many positive emotions are experienced distinctly, and how strongly interrelated each of these positive emotions are. History suggests that taxonomic work can be highly generative for a research discipline, by providing scientists with a common set of core constructs around which to base their research and a common language with which to discuss empirical findings. Such was the case in personality psychology, which, prior to the 1970s, exhibited scattered empirical and theoretical progress, as individual researchers elaborated on individual constructs without understanding how these constructs—and associated empirical findings—related to one another (Adelson, 1969, Goldberg, 1990, 1993; McAdams, 1997; Mischel, 1968). Beginning in the 1980s, however, personality research increasingly began to center on the Big Five traits—a succinct list of constructs thought to capture the majority of meaningful variance in human personality—and this development brought considerable stability and generativity to the field (John, Naumann, & Soto, 2008). The present work was conducted, to some extent, in the spirit of

beginning the search for a “*Positive Emotion Big XX*”, with the hope that a taxonomy of subjectively experienced positive emotional states might bring similar benefits to the study of positive emotions as the original Big Five work did to the study of personality.

More specifically, constructing a taxonomy of positive emotions is likely to have both theoretical and empirical benefits for the field. First, it would help determine exactly how similar or dissimilar positive emotions are from one another, and whether any currently studied emotions are in fact redundant. Such findings might also indicate that certain previously reported empirical effects are attributable to multiple emotions, as opposed to only one. For example, if admiration and gratitude are found to be redundant, prior empirical studies demonstrating an effect of admiration might be re-interpreted as also providing insights about gratitude.

Second, a comprehensive taxonomy of subjectively experienced positive emotional states would advance affective scientists’ ability to identify non-subjective components of positive emotions. In a recently proposed a biological model of positive emotions, Shiota Campos, Oveis, Hertenstein, Simon-Thomas, and Keltner (2016) made hypotheses about the various common neural substrates of a range of distinct positive emotions; their work was facilitated by studies identifying features *other than* subjective experience that distinguish among these positive states. These include non-verbal vocalizations (e.g., Cordaro, Keltner, Tshering, Wangchuk, & Flynn, 2016; Sauter, Eisman, Ekman, & Scott, 2010; Simon-Thomas, Keltner, Sauter, Sinicropi-Yao, & Abramson, 2009), facial and bodily expressions (e.g., Campos, Shiota, Keltner, Gonzaga, & Goetz, 2013; Tracy & Robins, 2008), touching (e.g., Hertenstein, Holmes, McCullough, & Keltner, 2009; Hertenstein, Keltner, App, Bulleit, & Jaskolka, 2006), and autonomic profiles (e.g., Shiota, Neufeld, Yeung, Moser, & Perea, 2011). A comprehensive taxonomy of subjectively experienced positive emotions would further inform these investigations by

clarifying the subjective content of each of these emotions—thereby helping to arrive at an empirical definition of each—and highlighting which of these emotions are experienced most distinctly from one another. In other words, if similar positive emotions (e.g., gratitude and admiration) are found to consist of a largely overlapping set of thoughts, feelings, and action tendencies, it becomes questionable whether researchers should seek to uncover distinct biological underpinnings of the two. More broadly, building a taxonomy of subjectively experienced positive emotions would help bring research on subjective and non-subjective components of emotions into alignment.

In Chapter 4, we therefore sought to develop a comprehensive taxonomy of subjectively experienced distinct positive emotions, and to construct scales to measure each of these states. This research involved two parts. In Part 1, reflecting the field's iteration back to Stage 1 of the measurement-theory cycle, we identified the subjective content of each distinct positive emotion currently studied in the literature, drawing primarily on lay experience of these states, to arrive at a definition and measurement tool for each of these emotions. We began, in Study 1, by generating a comprehensive list of subjective components constituting each distinct emotion, and asking five samples of participants to report the extent to which each of these components characterized their experience during a recalled instance of each emotion. Factor analyzing these ratings, we examined the structure of these subjective components with the goal of determining whether a unique set of components would emerge for each positive emotion, and what the most central of these components were for each emotion. Study 1 therefore allowed us to provide a rough, initial test of the extent to which each positive emotion typically studied in the literature is experienced distinctly. In Study 2, we replicated Study 1 and used results to construct short,

reliable scales to assess each positive emotion that replicated across the two studies. In this study we also began to seek evidence for the validity of these scales.

In Part 2, reflecting a second foray into Stage 2 of the measurement-theory cycle, we moved beyond examining the separate content of each subjectively experienced positive emotion to map out the entire domain of the positive emotion landscape. In Studies 3 and 4, participants wrote about momentary emotional experiences and reported the extent to which they experienced a range of distinct positive emotions in response, and in Study 5 participants reported their dispositional tendency to experience each emotion. By examining the intercorrelations among all emotions in these three studies, we determined the extent to which each positive emotion is experienced distinctly at the state and trait level. We also examined relations between each positive emotional disposition and a suite of personality and affective traits, to further map the nomological network of each emotion, or the network of constructs in which a construct is embedded (Cronbach & Meehl, 1955).

In summary, the present research sought to uncover the distinctive subjective content of each positive emotion currently studied in the literature, and, more broadly, to determine the extent to which positive emotions are experienced distinctly at the self-report level. This research is therefore the first to yield a comprehensive portrait of both individual subjectively experienced positive emotions and the entire map of positive emotional experience.

4.1 Study 1

Study 1 had three goals. First, we aimed to generate a broad initial list of subjective components (i.e., thoughts, feelings, and action tendencies) that constitute typical experiences of each positive emotion currently studied in the literature. Second, we aimed to discover the set of subjective components that best captures the experience of each of these emotions, based on

participants' reports of distinct emotional experiences and their ratings of the subjective components felt in response. Using factor analyses, we determined the number of distinct emotion factors that emerged from these ratings. We were guided by an *a priori* expectation that each positive emotion would form a distinct factor. However, given the large number of positive emotions included in our initial list, it seemed plausible that a distinct factor may not emerge for every emotion; we assumed that such an absence would indicate that the emotion in question is not associated with a distinct set of subjective components.

Our third goal was to select, from that initial list of subjective components, those that best captured each emotion that emerged as a distinct factor. To do so, we followed a consensual approach emerging from the scale development literature, with the intention of being inclusive in item retention (e.g., Clark & Watson, 1995; Reise, Waller, & Comery, 2000; Simms, 2008). For clarity, Figure 1 displays a flowchart representing the methodological approach used in Studies 1 and 2 to generate, prune, and retain subjective components for each positive emotion.

4.1.1 Method

4.1.1.1 Initial item pool generation

We began by selecting for inclusion all positive emotions that appeared in at least three empirical studies examined in a recent review of articles published in the journal *Emotion* during its first decade of publication, from 2001-2011 (see Weidman et al., 2016); this yielded the following 18 emotions: admiration, amusement, attachment love, awe, compassion, contentment, empathy, enthusiasm, gratitude, happiness, hope, interest, love, nurturant love, romantic love, schadenfreude, sympathy, and tenderness. We excluded two emotions that we considered to be synonyms of happiness (i.e., “joy” and “elation”), and one that we considered a synonym of low activation (i.e., “calmness”). We also excluded pride because prior research has extensively

examined and uncovered the subjective content of pride, including identifying two separate facets that constitute people's experiences of this emotion (Tracy & Robins, 2007). We categorized the 18 included emotions into one of five thematic groups: *other-appreciation* (i.e., admiration, awe, and gratitude), *caring* (i.e., empathy, sympathy, tenderness, and compassion),²² *enjoyment* (i.e., happiness, contentment, amusement, and *schadenfreude*), *engagement* (i.e., hope, enthusiasm, and interest), and *loving* (i.e., love, romantic love, attachment love, and nurturant love).

To generate an initial list of subjective components associated with each of these 18 emotions, a sample of 150 ($M_{\text{age}} = 20.00$; $SD = 2.47$; 85% women) *content-generation participants* were asked to think back on a time when they had experienced each of the three or four emotions within one thematic group (N per group = 30), and report up to 10 subjective components associated with that experience (e.g., thoughts, feelings, action tendencies). We compiled their responses into a list of all reported components for each emotion, sorted by how frequently they were mentioned. The total number of unique components mentioned for each emotion ranged from 124 to 167 ($M = 143.72$; $SD = 14.65$), and each of these was mentioned by 1 to 19 participants ($M = 1.63$; $SD = 1.71$; Median = 1). We then converted all components that had been mentioned more than once into a potential scale item ($n = 645$ items).

These items were sorted into conceptual categories *within* each emotion based on content; for example, several items mentioned in response to *admiration* were categorized as falling within a conceptual category of *wanting to emulate someone* (e.g., "I felt as if I could learn a lot from a specific person", "I strongly valued a specific person's opinion"). Next, we re-examined

²² We included sympathy in this category despite the fact that it has not always been viewed as a positive emotion (e.g., Fredrickson, Tugade, Waugh, & Larkin, 2003) because it is often conceptualized as part a family of related emotions that include empathy, tenderness, and compassion (e.g., Batson, Fultz, & Schoenrade, 1987; Eisenberg et al., 1994; Goetz et al., 2010).

the subjective components that had been mentioned by only one participant ($n = 1,941$), and, for those that fit into one of the previously derived conceptual categories, converted them into an additional potential scale item. For example, the item “I felt a desire to become more like a specific person,” mentioned by one participant, was added to the conceptual category *wanting to emulate someone*, within *admiration*.

Finally, for the sake of completeness, several additional subjective components were added to certain conceptual categories based on a review of the prior literature, including theoretical reviews of distinct emotions and studies using prototype analyses (these additional components amounted to less than 5% of the total number of subjective components included in our initial pool). For example, the component, “I wanted to tell others about someone” was added to the conceptual category *tell the world* for the emotion *admiration*, based on prior work indicating that individuals who feel admiration tend to endorse this statement (Algoe & Haidt, 2009). Similarly, the component “I attended closely to someone's needs” was added to the conceptual category *caring for someone* for the emotion *nurturant love*, based on prior research suggesting that this behavioral tendency is central to nurturant love (Griskevicius, Shiota, & Neufeld, 2010; Shiota et al., 2011). The total number of conceptual categories for each emotion ranged from 4-11 ($M = 8.11$; $SD = 2.37$), and these categories each contained 1-22 items ($M = 6.95$, $SD = 4.14$). A complete list of conceptual categories and subjective components contained within each can be found at <http://ubc-emotionlab.ca/wp-content/uploads/2016/05/Conceptual-Categories-List.xlsx>.

We next reviewed the list of components in each conceptual category and identified a subset that best met the following criteria: (a) the component appeared face valid, in that it seemed to capture an aspect of the focal emotion that both authors considered important; (b) the

component captured the central thrust of the given conceptual category; (c) the component was written in a relatively straightforward manner; and (d) the component referred to a fairly general (vs. highly specific) thought, feeling, or action tendency, so that it could plausibly be endorsed by most individuals. Additionally, given our interest in developing scales that assessed subjective experiences, we cut components that referred to a nonverbal expression (e.g., “I smiled”). We also cut components that were comprised of a label for a different emotion (e.g., “I felt guilty at not being able to improve the situation” was cut as an item for the emotion *sympathy*), given our goal of developing scales that measured each emotion distinctly from closely related emotions. For each emotion, we also added an item that included the label of that emotion (e.g., “I felt admiration” for *admiration*). We then compiled the selected components into an initial list of scale items for each emotion ($M = 26.39$ items; $SD = 9.57$; Range: 10-44).

4.1.1.2 Participants

Five new samples of *emotion-experience participants*—separate from *content-generation participants*—were recruited to write about several past emotional experiences, falling within one of the five broad emotion categories. Sample 1a was assigned to write about admiration, awe, and gratitude (other-appreciation emotions), Sample 1b was assigned to write about empathy, compassion, sympathy, and tenderness (caring emotions), Sample 1c was assigned to write about happiness, contentment, amusement, and schadenfreude (enjoyment emotions), Sample 1d was assigned to write about hope, enthusiasm, and interest (engagement emotions), and Sample 1e was assigned to write about love, romantic love, nurturant love, and attachment love (loving emotions). Samples 1a, 1b, 1d, and 1e were comprised of undergraduate students who participated in exchange for course credit (Sample 1a: $n = 267$, M age = 20.31, $SD = 2.58$, 75% women; Sample 1b: $n = 185$, M age = 20.7, $SD = 3.18$, 69% women; Sample 1d: $n = 151$, M age

= 21.32, $SD = 3.20$, 79% women; Sample 1e: $n = 170$, $M age = 20.39$, $SD = 3.09$, 84% women). Sample 1c was comprised of community members recruited from public locations in Vancouver ($n = 599$, $M age = 28.44$, $SD = 10.25$, Range = 18-78; 68% women); Sample 1c was larger than the other samples due to procedural differences, described below.

4.1.1.3 Procedure

Participants completed the relived emotion task (RET; Ekman, Levenson, & Friesen, 1983) for each assigned emotion. In the RET participants are asked to spend up to five minutes thinking back on a time when they experienced a given emotion, and write details about that experience. After performing this task for each emotion, participants rated the extent to which they experienced each of the items included in the list for that emotion and the other two or three emotions within the category during their emotional experience, using a five-point scale (1 = “not at all”; 5 “very much”). For example, Sample 1a participants completing the RET for *admiration* would subsequently rate their experience on all 56 items included for *admiration*, *awe*, and *gratitude*. The RET has previously been shown to be an effective means of eliciting both subjective and physiological responses associated with the emotion recalled (e.g., Ekman et al., 1983; Levenson, Carstensen, Friesen, & Ekman, 1991).

In all cases except one, RET instructions included the label for each emotion (e.g., “admiration”), but no additional information about the meaning of that emotion, given our goal of using a largely bottom-up approach to identify the content of each positive emotion as understood and experienced by lay people. Furthermore, this approach maps onto the way these emotions are typically studied; in the large majority of distinct-emotion research, emotions are assessed using single items based on the emotion label (Weidman et al., 2016). The one exception was *schadenfreude*, an emotion defined by a German word that many participants have

never encountered; we defined *schadenfreude* as “the feeling of joy, satisfaction, or pleasure at seeing someone else fail or suffer misfortune.”

In Sample 1a, participants were randomly assigned to complete the RET for 2 of the 3 emotions in their assigned group. In Sample 1c, participants were randomly assigned to complete the RET for 1 of the 3 emotions in their assigned group. For Samples 1b, 1d, and 1e, participants completed the RET for each of the 3 emotions in their respective group, in a random order.

4.1.1.4 Analyses

Within each sample, we conducted exploratory factor analyses using maximum likelihood estimation on participants’ ratings of all items, separately for each emotion. For example, for Sample 1a, we conducted separate factor analyses of ratings made in response to *admiration*, *awe*, and *gratitude* narratives. For each narrative, our analyses involved two steps. First, we arrived at an appropriate number of factors by choosing the rotated factor solution that best characterized the data, based both on our expectation that items capturing each emotion would likely form a distinct factor and an examination of the scree plot; this led us to expect a total of 3-4 factors from each analysis, depending on the number of distinct emotions included in the category (e.g., for Sample 1a participants, we expected three factors to emerge, one each for *admiration*, *awe*, and *gratitude*).

We chose this criterion for establishing the correct factor solution—rather than a stricter test such as parallel analysis—because we had an *a priori* theoretical expectation that a factor would form for each positive emotion for which we had included content items. We were, however, open to the possibility that a factor might not emerge for each emotion, which would indicate that the emotion in question is not associated with a unique set of subjective components—that is, that the components included for that emotion are in fact more strongly

associated with some other emotion, or with no coherent emotion at all. In contrast, methods such as parallel analysis are purely empirical, and therefore suggest extracting any grouping of items that is mathematically determined to be somewhat distinct from other items, regardless of theoretical considerations. Given that distinct emotions are often comprised of multiple component experiences, which can occur somewhat independently of each other (Russell, 1991b; Scarantino, 2015; Shaver et al., 1987), empirical factor extraction methods will typically suggest a greater number of factors than positive emotions currently studied in the literature, by virtue of identifying components within emotions as distinct factors themselves (e.g., the conceptual categories we identified within each emotion might be identified as separate factors). We examined factor solutions using both varimax and oblimin rotation, to ensure that the number and content of factors in each chosen solution was conceptually similar across both methods.

Second, we selected a set of *best items* for each emotion. From our chosen factor solution for each emotion, we first identified the factor with content that best matched the emotion participants had written about in the narrative (henceforth referred to as the *focal emotion* factor; e.g., a factor emerging from ratings following narratives about *admiration* that showed highest loadings for admiration content items). Any item with a primary loading greater than .40 on the focal emotion factor and a cross loading less than .30 on all other factors in either the varimax or oblimin solution was included as a “best item”. We adopted these relatively liberal factor-loading cutoffs with the intention of retaining, at this stage, all items that seemed to even moderately capture an emotion of interest to a greater extent than some other emotion (see Clark & Watson, 1995, for further discussion).

In cases where this first step yielded fewer than 10 items for any emotion, we took steps to identify additional best items. First, we turned to narratives following other emotions in the

same category, and identified factors with content that matched the emotion of interest (henceforth a *non-focal emotion* factor; e.g., a factor emerging from ratings following narratives about awe with highest loadings for admiration items). Any item with a primary loading greater than .40 on the non-focal emotion factor and a cross-loading less than .30 on all other factors, across narratives written in response to at least two other emotions in the same category, was also included as a best item (e.g., an item that met our criteria on an admiration factor that emerged from ratings made in response to both the awe and gratitude narratives). Second, if a list of best items still contained fewer than 10 items, we added items that met our loading criteria on non-focal emotion factors emerging in response to narratives elicited by one other emotion (e.g., an item that met our criteria on an admiration factor that emerged from ratings made in response to awe narratives, but not gratitude narratives).

We also avoided selecting items that were redundant with others already included in the list, or that were negations (e.g., “I felt stress-free”), given the pervasive source of bias reverse-worded items can introduce (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Finally, at this early stage, we always retained the focal emotion term itself as a best item (e.g., “I felt admiration” for *admiration*) except where noted. Importantly, in line with our goal of capturing the content of each emotion as it is experienced by lay persons, our item-selection was not guided by our initial classification of items into conceptual categories, or participants’ initial nomination of items as describing one specific emotion. In contrast, all items within a group of emotions (e.g., other-appreciation emotions) could conceivably have emerged as markers of any of the three or four emotions within that group (e.g., admiration, awe, or gratitude), regardless of which emotion it was initially listed for.

4.1.2 Results

All reported results were nearly identical across varimax and oblimin rotations; we therefore report only one set of results for each analysis, and note instances in which the two solutions diverged.

4.1.2.1 Sample 1a

We separately determined the factor solution that best characterized ratings made in response to narratives of admiration, awe, and gratitude. First, when participants wrote about admiration, a scree test indicated either a three- or four-factor solution for their ratings; the first six eigenvalues were 15.19, 5.37, 3.82, 2.75, 1.93, and 1.57. The first three factors accounted for 44% of variance, and the first four accounted for 48%. In both solutions the first three factors were similar in content; factor 1 contained items related to gratitude (e.g., “I wanted to express thanks”; “I felt appreciative toward a specific person”; “I felt cared for”; and “I felt gratitude”), factor 2 contained items related to awe (e.g., “What I saw was simply amazing”; “I was rendered speechless”; and “I felt awe”), and factor 3 contained items related to feelings of unworthiness (e.g., “I felt small in comparison to a specific person”; and “I realized I am inept”). In the four-factor solution, an additional fourth factor contained items related to admiration (e.g., “I felt as if I could learn a lot from a specific person”; “I had a great deal of respect toward a specific person”); in contrast, in the three-factor solution these items tended not to load strongly on any of the three factors. Given our *a priori* expectation that admiration is a distinct emotion which should emerge as a factor in ratings of emotional responses to narratives about admiration, we determined that the four-factor solution best characterized the data.

Second, when participants wrote about awe, a scree test again indicated a three- or four-factor solution; the first six eigenvalues were 15.96, 8.05, 3.50, 2.25, 1.92, and 1.61. The first

three factors accounted for 49% of variance, and the first four accounted for 53%. In the three-factor solution, factor 1 captured gratitude, factor 2 captured unworthiness—and also included several admiration items—and factor 3 captured awe. In the four-factor solution, the gratitude, awe, and unworthiness factors again emerged, along with a separate admiration factor. To maintain consistency with results from the admiration narratives, we determined that the four-factor solution best characterized the data. In both the three- and four-factor solutions, the highest loading items on the awe factor were identical (e.g., “What I saw was simply amazing”, “I felt I was in the presence of something quite out of the ordinary”), suggesting that our subsequent decisions about which items to retain as best capturing awe would be relatively robust to our factor retention decisions.

Third, when participants wrote about gratitude, a scree test indicated a four-factor solution; the first six eigenvalues were 15.69, 6.04, 4.29, 2.83, 1.58, and 1.38, and the first four factors accounted for 51% of variance. Factor 1 captured gratitude and factor 2 captured awe, across both varimax and oblimin solutions. However, in the varimax solution, factor 3 also contained items related to awe, and factor 4 captured unworthiness; in contrast, in the oblimin solution, factor 3 captured unworthiness, and factor 4 contained no items that met our loading criteria (i.e., all loadings were below .40). Given that neither of these solutions seemed theoretically plausible or psychometrically sound, we next evaluated the three-factor solution; in both varimax and oblimin rotations, the first two factors again captured gratitude and awe, and factor 3 captured unworthiness. These solutions were psychometrically superior to the four-factor solution, in that all factors contained items that met our loading criteria, and still included gratitude as a distinct factor; we therefore determined that the three-factor solution best characterized the data. The first three factors accounted for 46% of variance. In both the three-

and four-factor solutions, the highest loading items on the gratitude factor were identical (e.g., “I felt appreciative toward a specific person,” “I wanted to express thanks”), suggesting that our subsequent decisions about which items to retain as capturing gratitude would be relatively robust to our factor retention decisions.

Based on these results and the *a priori* criteria outlined above, we arrived at a list of 7, 11, and 9 best items, for admiration, awe, and gratitude, respectively.²³

4.1.2.2 Sample 1b

We separately determined the factor solution that best characterized ratings made in response to narratives of empathy, sympathy, tenderness, and compassion. First, when participants wrote about empathy, a scree test indicated a three-factor solution; the first seven eigenvalues were 22.68, 6.82, 5.54, 3.08, 2.78, 1.96, and 1.89, and the first three factors accounted for 44% of variance. Factor 1 contained items related to empathy (e.g., “I tried to show understanding toward someone”; “I tried to relate to another's experience”; “I felt empathy”), factor 2 contained items related to sympathy (e.g., “I felt bad for someone”; “I worried that someone would not be okay”; and “I felt sympathy”), and factor 3 contained items related to tenderness (e.g., “I had a desire to be close to someone”; “I showed fondness toward someone”; and “I felt tenderness”).

It is noteworthy that a distinct compassion factor did not emerge in response to empathy narratives, and the item “I felt compassion” showed only modest loadings on both the empathy and sympathy factors (.38-.45 and .40-.46, respectively). To ensure that we had not omitted a compassion factor due to our decision to adopt the 3-factor solution, we next examined the four-factor solution. The first three factors were largely identical to those in the three-factor solution,

²³ We did not retain any of the unworthiness items. Although these items formed a unique factor across admiration, awe, and gratitude narratives, they did not show high loadings on any of the focal emotion factors, and therefore did not seem central to any of the three emotions of interest.

and the fourth factor contained items that seemed to capture perspective-taking, which has traditionally been conceptualized as a more narrow, cognitive component of empathy (e.g., “I compared someone's predicament to something I had gone through”; “I reflected on a time I had experienced a similar situation”; Batson et al., 1987; Davis, 1983; Decety & Cowell, 2014; Preston & DeWaal, 2002; Zaki, 2014). Notably, the item “I felt compassion” still showed modest loadings on both the empathy and sympathy factors (.46-.53 and .42-.43, respectively). Given the absence of a clear compassion factor in the four-factor solution, and the fact that our other three focal emotions were well represented in the three-factor solution, we determined that the three-factor solution best characterized the data. In both the three and four-factor solutions, the highest loading items on the empathy factor were identical (e.g., “I offered assurance to someone”, “I showed consideration for someone”, suggesting that our decision of which items to retain for empathy were relatively robust to our factor retention decision.

Second, when participants wrote about sympathy, a scree test again indicated a three-factor solution; the first seven eigenvalues were 27.54, 6.30, 4.40, 3.05, 2.43, 1.84, and 1.53, and the first three factors accounted for 48% of variance. Factor 1 contained items related to empathy, factor 2 contained items related to tenderness, and factor 3 contained items related to sympathy. Again, no distinct factor capturing compassion emerged, and the item “I felt compassion” showed low-to-moderate loadings on all three other factors (.27-.31 and .37-.49, respectively). As before, to ensure that we had not omitted a compassion factor, we examined the four-factor solution; the empathy, sympathy, and tenderness factors again emerged, as did a fourth factor capturing the perspective-taking component of empathy. Furthermore, in this solution the item “I felt compassion” still showed modest loadings on the empathy, sympathy, and tenderness factors (.27-.35 and .34-.48, respectively). We therefore determined that the

three-factor solution best characterized the data. In both the three- and four-factor solutions, the highest loading items on the sympathy factor were identical (e.g., “I wanted to lessen another person's suffering”; “I had a great desire to end someone's pain”), suggesting that our decision of which items to retain for sympathy would be relatively robust to our factor retention decision.

Third, when participants wrote about tenderness, a scree test indicated a four-factor solution; the first seven eigenvalues were 25.98, 12.06, 3.40, 3.01, 1.96, 1.80, and 1.54, and the first four factors accounted for 56% of variance. Factor 1 contained items related to empathy, factor 2 contained items related to tenderness, factor 3 contained items related to sympathy, and factor 4 contained items related to the perspective-taking component of empathy. Again, no distinct factor capturing compassion emerged; the item “I felt compassion” loaded most strongly on the empathy factor (.51-.56), and showed a small cross-loading on the tenderness factor (.27-.34). Again, to ensure we did not miss a compassion factor, we also examined the three-factor solution; the three factors contained items related to empathy, tenderness, and sympathy, respectively, similar to results observed for empathy and sympathy. In this solution, the item “I felt compassion” continued to show moderate loadings on the empathy and tenderness factors (.37-.43 and .42-.49, respectively). To maintain consistency with the chosen factor solutions for empathy and sympathy, and in light of considerable prior theorizing and empirical findings suggesting that perspective taking is a core cognitive component of empathy (e.g., Batson et al., 1987; Davis, 1983; Decety & Cowell, 2014; Preston & DeWaal, 2002; Zaki, 2014), we determined that the three-factor solution best characterized the data. The first three factors accounted for 52% of variance. In both the three- and four-factor solutions, the highest loading items on the tenderness factor were identical (e.g., “I showed affection toward someone”; “I felt

a stronger connection with someone”), suggesting that our decision about which items to retain for tenderness would be relatively robust to our factor retention decision.

Finally, when participants wrote about compassion, a scree test again indicated that a four-factor solution would be appropriate; the first seven eigenvalues were 29.75, 7.35, 3.72, 3.24, 2.14, 1.65, and 1.49, and the first four factors accounted for 56% of variance. Factor 1 contained items related to empathy, factor 2 contained items related to sympathy, factor 3 contained items related to tenderness, and factor 4 contained items related to perspective-taking. Again, no distinct factor capturing compassion emerged, and the item “I felt compassion” showed weak loadings on the empathy and tenderness factors (.25-.32 and .26-.29, respectively). As with tenderness narratives, to ensure we did not miss a compassion factor, we also examined the three-factor solution; the first three factors contained items related to sympathy, tenderness, and empathy, respectively, similar to results for the prior three emotions. In this solution, the item “I felt compassion” continued to show weak to moderate loadings on the tenderness and sympathy factors (.32-.33 and .22-.26, respectively).

As one final check to ensure that the absence of a compassion factor was not due to our factor retention decisions, we examined the five-factor solution. The first four factors replicated those that emerged from the four-factor solution, and an additional fifth factor had only one item that met our loading criteria (“I wanted to caress someone”); this item had loaded on the tenderness factor in the three- and four-factor solutions. Similar to the three- and four-factor solutions, the item “I felt compassion” showed small loadings on the empathy and tenderness factors (.24-.31 and .27-.31, respectively). We therefore found no evidence for a distinct compassion factor across the three, four, and five-factor solutions, suggesting that compassion is

not associated with a unique set of subjective components, apart from components that capture empathy, sympathy, and tenderness.

Based on these results and the *a priori* criteria outlined above, we arrived at a list of 18, 11, and 14 best items, for empathy, sympathy, and tenderness, respectively. We did not include any items specific to compassion, but it is worth noting that many of the items initially included as compassion items were retained as items for empathy, sympathy, or tenderness.

4.1.2.3 Sample 1c

We separately determined the factor solution that best characterized ratings made in response to narratives of happiness, contentment, amusement, and schadenfreude. First, when participants wrote about happiness, a scree test indicated either a four or five-factor solution; the first seven eigenvalues were 14.45, 9.05, 4.72, 3.56, 3.45, 2.89, and 2.68. The first four factors accounted for 35% of variance, and the first five accounted for 39%. For both solutions, the first four factors were similar in content. Factor 1 contained items related to both happiness and contentment (e.g., “I felt complete”; “I wished the moment would continue”, “I felt that all was right in the world”; “I felt happy”; and “I felt content”), factor 2 contained items related to schadenfreude (e.g., “I wanted to point out someone else's shortcomings”; “I felt smug”; “I thought that someone had it coming”; and “I felt schadenfreude”), factor 3 contained items related to physiological activation (e.g., “I felt an adrenaline rush”; “I felt enthusiastic”; and “My heart was racing”), and factor 4 contained items related to approach behaviors (e.g., “I wanted to act friendly to others”, “I wanted to spread happiness”) and amusement (e.g., “What I saw was funny”; “I felt amusement”). In the five-factor solution, however, factor 5 contained only three items that met our loading criteria, and these did not exhibit coherent content (e.g., “I felt relieved”; “I felt motivated”; and “I had no desires” [negative loading]). Given the conceptual

and psychometric problems with the fifth factor, and the fact that all four of our focal emotions of interest were somehow represented in the four-factor solution, we determined that the four-factor solution best characterized the data. Furthermore, in the four and five-factor solutions, the highest loading items on the happiness/contentment factor were identical (e.g., “I felt complete”, “I felt joy,” and “I felt lucky”), suggesting that our decision of which items to retain for happiness and contentment was relatively robust to our factor retention decision.

Second, when participants wrote about contentment, a scree test indicated a three-factor solution, though a four-factor solution could also be acceptable; the first seven eigenvalues were 17.17, 8.10, 3.84, 3.31, 3.14, 2.98, and 2.79. The first three factors accounted for 32% of variance, and the first four accounted for 36%. In both solutions, factor 1 captured happiness/contentment, factor 2 captured *schadenfreude*, and factor 3 captured amusement/approach orientation. In the four-factor solution, the fourth factor contained one or zero items that met our loading criteria; in contrast to happiness, ratings made in response to contentment did not yield a distinct activation factor. We therefore determined that the three-factor solution best characterized the data. In both the three- and four-factor solutions, the highest loading items on the happiness/contentment factor were identical (e.g., “I felt satisfied,” “I felt joy,” and “I felt that all was right in the world”), suggesting that our decision of which items to retain for happiness and contentment were relatively robust to our factor retention decisions. Moreover, the content of the happiness/contentment factors was nearly identical across both happiness and contentment narratives. The finding that only one factor emerged for happiness and contentment items, and that happiness/contentment was represented by one nearly identical factor across both happiness and contentment narratives, suggests that happiness and contentment may be subjectively experienced as the same emotional state.

Third, when participants wrote about amusement, a scree test indicated a four-factor solution; the first seven eigenvalues were 23.82, 6.08, 5.01, 4.12, 3.21, 2.87, and 2.56. The first four factors accounted for 44% of variance. Factor 1 captured happiness/contentment, factor 2 captured activation and approach orientation, factor 3 captured schadenfreude, and factor 4 captured amusement. Notably, in the three-factor solution, amusement did not form its own factor, and the amusement items showed low loadings on the activation/approach factor. Given our *a priori* expectation that amusement would constitute a distinct emotion in response to amusement narratives, we determined that the four-factor solution best characterized the data.

Finally, when participants wrote about schadenfreude, a scree test again indicated a four-factor solution; the first seven eigenvalues were 19.80, 8.04, 5.19, 3.98, 2.81, 2.70, and 2.68. The first four factors accounted for 41% of variance. Factor 1 captured happiness/contentment, factor 2 captured schadenfreude, factor 3 captured activation and approach orientation, and factor 4 captured amusement, and also contained a small number of items related to approach behaviors. In contrast, in the three-factor solution the happiness/contentment, activation/approach, and amusement factors appeared to blend together, with two factors containing a mix of items capturing these constructs, and a third factor again capturing schadenfreude. To maintain consistency with the results of the prior three emotions, we therefore determined that the four-factor solution best characterized the data. In both the three- and four-factor solutions, the highest loading items on the schadenfreude factor were identical (e.g., “I thought someone deserved what had happened to them”, “I felt that justice had been served for someone else”, and “I thought that someone had it coming”), suggesting that our decision of which items to retain for schadenfreude was relatively robust to our factor retention decisions.

Based on these results and the *a priori* criteria outlined above, we arrived at a list of 21, 6, and 11 best items, for happiness/contentment, amusement, and schadenfreude, respectively. Of note, to be inclusive at this early stage, the item “I felt schadenfreude” was retained, despite showing low loadings on the schadenfreude factor in response to schadenfreude narratives.

4.1.2.4 Sample 1d

We separately determined the factor solution that best characterized ratings made in response to narratives of hope, enthusiasm, and interest, the engagement emotions. First, when participants wrote about hope, a scree test indicated a three-factor solution. The first six eigenvalues were 20.22, 7.22, 4.28, 3.13, 2.78, and 2.55, and the first three factors accounted for 43% of variance. Factor 1 contained items related to enthusiasm (e.g., “I felt euphoric”; “I was on top of the world”; and “I felt enthusiasm”), factor 2 captured hope (e.g., “I tried to believe in myself”; “I had a great desire for a certain outcome”; and “I felt hope”), and factor 3 appeared to capture a sense of distraction (e.g., “I could not focus on what I was doing”; “I felt impatient”; and “I felt distant from the world”).

Of note, an interest factor did not emerge, and the item “I felt interest” showed its highest primary loading on the enthusiasm factor (.66-.74). To ensure that the absence of an interest factor was not due to our factor retention decision, we examined the four-factor solution. The first three factors were the same as in the three-factor solution, and although the fourth factor contained several items related to interest (e.g., “My attention was absorbed”; “I paid close attention to what I saw and heard”), only one of these items met our loading criteria in the varimax solution, and none met our loading criteria in the oblimin solution. Furthermore, in the four-factor solution the item “I felt interest” continued to show its highest primary loading on the enthusiasm factor, and showed a low loading on the fourth factor (.27-.33). We therefore

determined that the three-factor solution best characterized the data. In both the three- and four-factor solutions, the highest loading items on the hope factor were identical (e.g., “I tried to believe in myself”; “I had a great desire for a certain outcome”), suggesting that our decision of which items to retain for hope was relatively robust to our factor retention decisions.

Second, when participants wrote about enthusiasm, a scree test again indicated a three-factor solution. The first six eigenvalues were 19.35, 7.07, 5.30, 2.96, 2.76, and 2.37, and the first three factors accounted for 42% of variance. Factor 1 contained items related to enthusiasm, factor 2 contained items related to hope, and factor 3 contained items related to distraction. As was the case for responses to hope narratives, no factor emerged that seemed to capture interest, and the item “I felt interest” showed its highest primary loading on the enthusiasm factor (.57-.61). To again ensure that the absence of an interest factor was not due to our factor retention decision, we examined the four-factor solution. The first three factors were the same as in the three-factor solution, but the item “I felt interest” now showed a moderate loading on the fourth factor (.44-.50), though it continued to show its highest primary loading on to the enthusiasm factor (.45-.52). This fourth factor also contained a few additional items relevant to interest, but only one of these met our loading criteria, primarily because interest-related items tended to show high cross-loadings on the enthusiasm factor. The ambiguity of the fourth factor, combined with the results of the scree test, led us to conclude that the three-factor solution best characterized the data. In both the three- and four-factor solutions, the highest loading items on the enthusiasm factor were identical (e.g., “I felt excited”; “I felt optimistic”; and “I felt outgoing”), suggesting that our decision of which items to retain for enthusiasm was relatively robust to our factor retention decisions.

Third, when participants wrote about interest, a scree test again indicated a three-factor solution. The first six eigenvalues were 18.43, 6.87, 4.60, 3.39, 3.20, and 2.27, and the first three factors accounted for 40% of variance. Factor 1 contained items related to hope, factor 2 contained items related to interest (e.g., “My attention was absorbed”; “I felt engaged with what I was doing”; “I wanted to seek out more information”; and “I felt interest”), and factor 3 contained items related to enthusiasm. Surprisingly, the item “I felt enthusiasm” showed a higher primary loading on the interest factor (.63-.68) than the enthusiasm factor (.36-.41). For the sake of completeness, we also examined the four-factor solution; the first three factors were the same as in the three-factor solution, and the fourth factor contained several items that seemed to capture uncertainty (e.g., “I was nervous”, “I felt doubt”). Given that this fourth factor had not emerged from responses to the hope or enthusiasm narratives, and that the three-factor solution captured all three focal emotions, we determined that the three-factor solution best characterized the data. In both the three and four-factor solutions, the highest loading items on the interest factor were similar (e.g., “My attention was absorbed”; “I was focused”; and “I paid close attention to what I saw and heard”), suggesting that our decision of which items to retain for interest was relatively robust to our factor retention decisions.

Based on these results and the *a priori* criteria outlined above, we arrived at a list of 13, 17, and 10 best items, for hope, enthusiasm, and interest, respectively.

4.1.2.5 Sample 1e

We separately determined the factor solution that best characterized ratings made in response to narratives of love, nurturant love, attachment love, and romantic love. First, when participants wrote about love, a scree test indicated a three-factor solution; the first seven eigenvalues were 25.35, 6.89, 5.98, 2.81, 1.98, 1.84, and 1.68, and the first three factors

accounted for 50% of variance. Factor 1 contained items related to romantic love (e.g., “I longed for someone”; “I felt intimate toward someone”; “I felt butterflies in my stomach”; “I felt romantic love”), factor 2 contained items related to nurturant love (e.g., “I wanted to help someone grow”; “I attended closely to someone's needs”; and “I made someone else feel better”), and factor 3 contained items related to attachment love (e.g., “I felt secure”; “I felt like I could rely on someone”; and “I felt that someone else was there for me”). Of note, the items “I felt nurturant love” and “I felt attachment love” did not show strong primary loadings on their respective factors. The nurturant love item showed a moderate loading on the attachment love factor (.43-.46), and small cross-loadings on the romantic love and nurturant love factors in the oblimin rotation (.22 and .28, respectively). The attachment love item showed moderate loadings on all three factors in both rotations (.42-.51, .34-.44, and .29-.43 on romantic love, attachment love, and nurturant love factors, respectively). In addition, the item “I felt love” showed its highest loading on the attachment love factor (.46-.51), with cross-loadings on the romantic love factor (.22-.31) and a cross-loading of .26 on the nurturant love factor in the oblimin rotation; these results suggest that participants responding to the single item “I felt love” may primarily have had in mind feelings of attachment love.

To ensure that we had not omitted a distinct factor for general love due to our factor retention decisions, we next examined the four-factor solution; the romantic, nurturant, and attachment love factors re-emerged, along with a factor defined by several items that described feelings of neediness for one’s partner, an intense desire to spend time with one’s partner, and a sense of insecurity over whether one’s love was reciprocated, which have been previously conceptualized as part of romantic love (e.g., “I felt lost without someone”; “I felt needy”; “I acted crazy about someone”; Berscheid, 2010; Diamond, 2014; Regan, Kocan, & Whitlock,

1998; Rubin, 1970). Notably, the item “I felt love” still showed modest loadings on the attachment love factor (.44-.50), as well as cross-loadings on the romantic love factor (.34-.37), and a cross-loading of .25 on the nurturant love factor in the oblimin rotation. In light of the absence of a clearly distinct general love factor in the four-factor solution, and prior work suggesting that feelings of neediness, desire, and insecurity regarding one’s partner are components of romantic love—rather than a separate emotion—we determined that the three-factor solution best characterized the data. These findings imply that *love* is not associated with one unique set of subjective components, but may be best characterized as consisting of three distinct subtypes. Following these analyses, we anticipated that responses to subsequent narratives regarding nurturant love, attachment love, and romantic love would reveal three distinct love types (i.e., nurturant, attachment, and romantic), and therefore yield three factors.

Indeed, when participants wrote about nurturant love, a scree test again indicated a three-factor solution; the first seven eigenvalues were 21.82, 10.94, 5.68, 2.12, 2.03, 1.69, and 1.49, and the first three factors accounted for 51% of variance. Factor 1 contained items related to nurturant love, factor 2 contained items related to attachment love, and factor 3 contained items related to romantic love. As was the case with responses to narratives about love, the items “I felt nurturant love” and “I felt attachment love” did not show strong primary loadings on their respective factors; instead, the nurturant love item showed a moderate loading on the attachment love factor (.51), and a small cross-loading on the nurturant love factor (.31-.34); and the attachment love item showed moderate loadings on all three factors (.24-.31, .36-.41, and .36-.44 on nurturant love, attachment love, and romantic love factors, respectively). In addition, the item “I felt love” again showed its highest loading on the attachment love factor (.62-.64), and cross-loadings on the romantic love factor (.23-.28). Given the consistency between this solution and

the three-factor solution that emerged in response to general love narratives, as well as the finding that all three types of love were represented in the three-factor solution, we determined that the three-factor solution best characterized the data.

Third, when participants wrote about attachment love, a scree test again indicated a three-factor solution; the first seven eigenvalues were 24.04, 7.12, 4.91, 3.13, 2.79, 1.79, and 1.60, and the first three factors accounted for 47% of variance. Factor 1 contained items related to attachment love, factor 2 contained items related to romantic love, and factor 3 contained items related to nurturant love. In contrast to the results for narratives about love and nurturant love, the item “I felt attachment love” showed a moderate loading on the attachment love factor (.49-.55); this item met our loading criteria in the varimax rotation, but also showed small cross-loadings on the nurturant and romantic love factors in the oblimin rotation (.35 and .36, respectively). Similar to the results for love and nurturant love, the item “I felt nurturant love” did not show strong primary loadings on the nurturant love factor; it instead showed a moderate loading on the attachment love factor (.47-.50) and a small cross-loading on the nurturant love factor (.25-.34). In addition, the item “I felt love” again showed its highest loading on the attachment love factor (.49-.62), and cross-loadings on the nurturant love factor (.27-.41), and a cross-loading of .29 on the romantic love factor in the oblimin rotation. Once again, given the consistency between this solution and the three-factor solution that emerged for love and nurturant love narratives, and that all three types of love were represented in the three-factor solution, we determined that the three-factor solution best characterized the data.

Finally, when participants wrote about romantic love, a scree test indicated a two or three-factor solution; the first seven initial eigenvalues were 33.94, 6.10, 3.36, 2.60, 1.84, 1.41, and 1.26. The first two factors accounted for 53% of variance, and the first three accounted for

57%. In the two factor solution, factor 1 contained items related to attachment love, as well as some items from the romantic love factors in prior narratives, and factor 2 contained items related to nurturant love, as well items capturing the more unpleasant aspects of romantic love, which loaded highly on the fourth factor in the four-factor solution for general love narratives. In light of our *a priori* expectation that romantic love would emerge as a distinct factor in response to romantic love narratives, we next examined the three-factor solution. Factor 1 contained items related to attachment love, factor 2 contained items related to romantic love, and factor 3 contained items related to nurturant love. Of note, the item “I felt romantic love” showed similar loadings on the attachment love and romantic love factors (.57-.65 and .52-.65, respectively). As was the case for responses to attachment love narratives, the item “I felt attachment love” showed a moderate loading on the attachment love factor (.51-.56); this item met our loading criteria in the varimax rotation, but showed cross-loadings of .43 and .51 on the nurturant and romantic love factors, respectively, in the oblimin rotation. Additionally, the item “I felt nurturant love” did not show its strongest primary loadings on the nurturant love factor; it showed moderate loadings on the attachment and nurturant love factors (.47-.51 and .49-.57, respectively), and a cross-loading of .36 on the romantic love factor in the oblimin rotation. Finally, the item “I felt love” again showed its highest loading on the attachment love factor (.66-.73), and cross-loadings on the romantic love factor (.42-.61), as well as a cross-loading of .31 on the nurturant love factor in the oblimin rotation. Given the consistency between the three-factor solution that emerged here and the three-factor solutions that emerged in response to love, nurturant love, and attachment love narratives, as well as the fact that all three types of love were represented in the three-factor solution, we determined that the three-factor solution best characterized the data.

Based on these results and the *a priori* criteria outlined above, we arrived at a list of 21, 18, and 16 best items, for nurturant love, attachment love, and romantic love, respectively. Of note, to be maximally inclusive at this early stage, the items “I felt attachment love”, “I felt nurturant love”, and “I felt romantic love” were retained for Study 2, despite each of these items showing strong cross-loadings on factors representing other forms of love.

4.1.3 Discussion

In Study 1, we uncovered the content of each positive emotion typically studied in the literature, by generating an initial list of subjective experiential components for each emotion, using a procedure that primarily emphasized participant-generated content. We identified factors comprised of these subjective components for each emotion, a list that included admiration, awe, gratitude, empathy, sympathy, tenderness, happiness/contentment, amusement, schadenfreude, hope, enthusiasm, interest, romantic love, nurturant love, and attachment love.

These results also highlighted several positive emotions that are frequently studied in the literature but may not be experienced as subjectively distinct, in that they are not comprised of a largely distinct set of subjective components. First, compassion did not emerge as a distinct factor when participants wrote about experiences of compassion, or about the three other caring emotions examined (i.e., empathy, sympathy, and tenderness); this may indicate that compassion is not experienced distinctly from these other states. More specifically, subjective components that were initially generated for compassion were found to better map onto experiences of empathy, sympathy, or tenderness, when participants recalled and reported on experiences of all four emotions. That said, a four-factor solution emerged—in response to all four of these caring emotions—which included the empathy factor split into two factors, one capturing supportiveness, understanding, and consideration for someone, and another capturing

perspective-taking. One might argue that empathy is best conceptualized by items that loaded on the second, narrower factor capturing perspective-taking, which would leave the first, broader factor as a representation of compassion. However, in all of the many extant theoretical accounts of empathy, perspective-taking is considered a component of the emotion, rather than the emotion itself (e.g., Batson et al., 1987; Davis, 1983; Decety & Cowell, 2014; Preston & DeWaal, 2002; Zaki, 2014). We therefore view empathy as a blend of these two factors (nicely captured as a single factor in the three-factor solutions), which also includes items typically associated with compassion.

Second, when participants wrote about enjoyment emotions (happiness, contentment, amusement, and *schadenfreude*), one factor consistently emerged that contained items related to both happiness and contentment, suggesting that these two emotions may not be experienced distinctly; the words “happiness” and “contentment” likely describe the same set of subjective emotional components. Following this result, we refer to the subjective components constituting these two emotions as “contentment” henceforth, to differentiate this potentially distinct positive emotional state from the vast literature on “happiness”, which is often conceptualized much more broadly as a blend of life satisfaction and pleasant (vs. unpleasant) affect (Busseri & Sadava, 2011; Diener, 1984, 2000; Dunn & Norton, 2013; Kahneman, 1999; Larsen, 2000).

Study 1 also provided support for previously proposed distinctions among certain positive emotions, particularly three distinct flavors of love: nurturant, attachment, and romantic (e.g., Berscheid, 2010; Fehr, 2015; Gonzaga et al., 2006; Shiota, Neufeld, Danvers, Osborne, Sng, & Yee, 2014). When participants wrote about each of these three forms of love, as well as the overarching emotion *love*, a distinct factor emerged for each of the three. Furthermore, the item “I felt love” loaded most strongly on the attachment love factor, suggesting that the term

love is most typically thought of as analogous to attachment love, or a secure bond with a nurturant or caring other. Notably, the items “I felt romantic love”, “I felt nurturant love”, and “I felt attachment love”, showed weak and inconsistent loadings on their respective factors. These results suggest that although individuals experience love in three separate forms, they may not have a clear understanding of the meaning that psychologists have attached to the labels used to describe these forms.

After identifying factors for each positive emotion, we trimmed the list of subjective components loading on these factors to arrive at a set of central components, using previously established factor-analytic practices. These final subjective component lists begin to paint a picture of the specific thoughts, feelings, and action tendencies that constitute these 15 states. These lists are relatively long, however, and likely contain many subjective components that are not central to each emotion; they therefore may be impractical as a self-report assessment tool. The primary goal of Study 2 was therefore to further trim these lists to arrive at a set of 5-8 subjective components for each emotion, which capture the central thrust of that emotion and which, when written in the form of self-report items, could be used as a scale for measuring each emotion.

4.2 Study 2

In Study 2, we aimed to replicate the findings of Study 1, to further pin down the distinctive subjective content of each positive emotion. Separate samples of participants again wrote about experiences of emotions and reported their feelings in response to each using the lists of subjective components generated in Study 1. We then employed factor analysis to narrow these initial lists but this time prioritized replicability, searching for subjective components that

met our loading criteria for a given emotion across both Studies 1 and 2. We used this final list to create a 5-8 item self-report scale for each positive emotion.

A second goal of Study 2 was to provide initial evidence for the validity of our newly constructed scales. First, we examined whether emotional experiences centering on one positive emotion elicited more intense reports of that emotion compared to other emotions within the same broader group, and whether emotions within each group showed moderate, positive intercorrelations with one another; both of these findings would support the validity of our scales. A third goal of Study 2 was to begin to explore the nomological network of each positive emotion. To do so, we first examined correlations between each positive emotion and the emotional dimensions of valence and activation, to determine the extent to which each “positive emotion” is experienced as positive and arousing. We also examined the extent to which each emotion correlated with dispositional variables meant to capture the propensity to feel that emotion chronically over time and across situations (e.g., whether momentary reports of awe correlate positively with the dispositional propensity to experience awe); this also served as an initial test of our scales’ convergent validity. Based on prior work examining the correlations between traits and related states, we anticipated that the magnitude of these correlations would be small to moderate (.10-.30; e.g., Fleeson & Gallagher, 2009).

4.2.1 Method

4.2.1.1 Participants

In exchange for course credit, separate samples of undergraduate students wrote narratives about 3-4 emotions within each broad category: Sample 2a ($n = 209$, M age = 21.08, $SD = 3.70$, 78% women) wrote about other-appreciation emotions; Sample 2b ($n = 207$, M age = 20.12, $SD = 2.34$, 77% women) wrote about caring emotions; Sample 2c ($n = 208$, M age =

19.50, $SD = 3.15$, 69% women) wrote about enjoyment emotions; Sample 2d ($n = 206$, M age = 20.48, $SD = 4.08$, 78% women) wrote about engagement emotions; Sample 2e ($n = 209$, M age = 20.82, $SD = 3.18$, 68% women) wrote about loving emotions.

4.2.2.2 Procedure

Participants followed an identical procedure to that of Study 1, except that after completing the RET for each emotion within the assigned category, in a randomly determined order, they rated the emotions felt in response using the items retained from Study 1. As in Study 1, participants rated items for all emotions within the given category when responding to each emotion narrative in that category (e.g., after writing about gratitude, participants rated their feelings using the scales developed to assess gratitude, admiration, and awe).²⁴ Additionally, in response to each emotion narrative, participants rated their feelings of pleasantness (α : $M = .81$; $SD = .07$) and activation (α : $M = .45$; $SD = .12$) on a five-point scale using the Current Mood Questionnaire (Barrett & Russell, 1998). Participants then completed a set of self-report scales measuring their dispositional tendency to feel certain emotions.

4.2.2.3 Dispositional emotion measures

Participants in Sample 2a completed the awe scale of the Dispositional Positive Emotions Scales (DPES; Shiota et al., 2006; $\alpha = .78$) and the Gratitude Questionnaire Six-Item Form (GQ-6; McCullough et al., 2002; $\alpha = .71$); we expected these measures to correlate positively with momentary experiences of awe and gratitude, respectively.

Participants in Sample 2b completed the compassion scale of the DPES (Shiota et al., 2006; $\alpha = .84$); the Parental Care and Tenderness Scale (PCAT; Buckles et al., 2015), which is

²⁴ In order to establish the robustness of our findings from Study 1, participants in Study 2 again wrote about experiences of compassion and love, even though we did not expect either of these two emotions to emerge as distinct. As was observed in Study 1, following these narratives factors emerged representing each of the other emotions in the same category, but no distinct factors emerged for compassion or love. We therefore do not present results for the compassion and love narratives in detail.

comprised of five subscales—propensity toward *positive tenderness* and *negative tenderness* (which assess people’s tendency to feel tenderness in different scenarios), as well as the propensity toward *liking*, *protecting*, and *caring for babies* (α s = .74-.93); and the Interpersonal Reactivity Index (IRI; Davis, 1983), which is comprised of four subscales—perspective-taking, personal distress, empathic concern, and fantasy (α ’s = .75-.86). To demonstrate convergent validity, we expected positive correlations between momentary sympathy and tenderness and DPES compassion, which captures similar themes (e.g., helping the needy; caring for others). For the same reason, we expected positive correlations between momentary tenderness and the PCAT scales of *positive* and *negative tenderness*; we expected this relation to be stronger for positive tenderness, however, given that several of the items described in the negative tenderness subscale appear to elicit negative emotions such as disgust (e.g., “You need to change a baby’s soiled diaper”) in addition to tenderness. We also expected positive correlations between momentary empathy and the perspective-taking subscale of the IRI; between momentary sympathy and the personal distress subscale of the IRI; and between the empathic concern subscale and momentary empathy, sympathy, and tenderness, as this scale contains content related to all three emotions.

Participants in Sample 2c completed the contentment, joy, and amusement scales of the DPES (Shiota et al., 2006; α ’s = .70-.89), and the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999; α = .89). To demonstrate convergent validity, we expected the DPES contentment and joy scales, as well as the SHS, to correlate positively with momentary contentment, and the DPES amusement scale to correlate positively with momentary amusement.

Participants in Sample 2d completed the Trait Curiosity Scale (Kashdan, Rose, & Fincham, 2004; α = .61) and the Life Orientation Test (LOT; Scheier, Carver, & Bridges, 1994;

$\alpha = .88$); we expected these measures to correlate positively with momentary experiences of interest and hope, respectively.

Participants in Sample 2e completed the love subscale of the DPES (Shiota et al., 2006; $\alpha = .81$), the Romantic Love Scale (Rubin, 1970; $\alpha = .81$), and the Experiences in Close Relationships-Relationships Structures questionnaire (ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011), which is comprised of two subscales, each of which is completed regarding one's romantic partner, best friend, mother, and father (α s = .80-.93). In light of the finding from Study 2 that individuals associate the word *love* most strongly with attachment love, we expected the DPES love scale to correlate positively with attachment love; we also expected the Romantic Love Scale to correlate positively with momentary romantic love. Finally, we expected the anxious attachment subscale of the ECR-RS to correlate positively with romantic love, an emotion that partly captures feelings of insecurity and neediness associated with an anxious attachment style; we also expected the avoidant attachment subscale to correlate negatively with attachment love, which seems to capture intimacy and a desire for closeness.

4.2.1.4 Analyses

As in Study 1, within each emotion group we conducted separate exploratory factor analyses using maximum likelihood estimation on participants' ratings of all the subjective components for each emotion within the category, in response to each emotional experience. After arriving at an appropriate number of factors, as in Study 1, we selected a set of central subjective components for each emotion, by including components that met our loading criteria on the focal emotion factor in one or both of the varimax and oblimin rotations, and which had also met the loading criteria on the same focal emotion factor in Study 1. For example, a component that met the loading criteria on the admiration factor when participants wrote about

admiration in both Studies 1 and 2 would be included in our final list, whereas a component that met the loading criteria in Study 1 but not Study 2 (or vice versa) would not be included.

We also always included the focal emotion term in our final lists, except where noted below. We next trimmed these lists with the goals of cutting redundant components and maintaining wide content coverage, until we arrived at 5-8 components for each emotion. Finally, we examined the convergent and discriminant validity of each emotion by assessing and comparing: (a) the means of each scale in response to each set of narratives; (b) the intercorrelations among the scales; (c) the correlations between each scale and momentary pleasantness and activation; and (d) the correlations between each scale and dispositional variables meant to capture the propensity to experience that emotion.

4.2.2 Results

4.2.2.1 Sample 2a

We first selected an optimal factor solution for each narrative. Consistent with our expectation that distinct factors would emerge for admiration, awe, and gratitude, a scree test indicated that a three-factor solution best characterized the data for each emotion. The first five eigenvalues were as follows: in response to admiration narratives: 6.30, 3.73, 2.71, 1.31, 1.13; in response to awe narratives: 9.16, 4.42, 2.20, 1.34, .94; and in response to gratitude narratives: 7.04, 3.24, 2.06, 1.58, 1.81. Across admiration, awe, and gratitude, respectively, the first three factors explained 41%, 53%, and 39% of the variance. Across all three narratives, inspection of a four-factor solution suggested that the fourth factor contained a subset of awe items, rather than constituting a distinct emotion, and was typically quite small (i.e., only 2-4 items with a primary loading above .40); we therefore retained the three-factor solutions. Inspection of the thoughts, feelings, and action tendencies constituting each factor, across all three narratives, suggested that

the factors represented admiration, awe, and gratitude, and these three factors had nearly identical content to the admiration, awe, and gratitude factors that emerged in Study 1. We used the item inclusion criteria outlined in Study 1 to arrive at lists of 6, 7, and 7 items, respectively, to include in self-report scales for measuring admiration, awe, and gratitude (α s = .73, .82, and .83, respectively; see Table 1).

We next turned our attention to examining the convergent and discriminant validity of each scale. First, we examined the scale intercorrelations (see Table S1 in the Online Supplement); the admiration and awe scales correlated .20, .22, and .40 following admiration, awe, and gratitude narratives, respectively; the admiration and gratitude scales correlated .48, .65, and .31, respectively; and the awe and gratitude scales correlated .12, .36, and .39, respectively. These results suggest that the three emotions share a modest amount of content, with admiration and gratitude at times showing considerable overlap, though largely in response to awe narratives, when both emotions were experienced at a lower intensity.

Second, we examined the means of each scale in response to each narrative (see Table S1). In response to admiration narratives, participants reported more intense admiration ($M = 4.23$, $SD = .68$) than awe ($M = 3.26$, $SD = .93$, $p < .001$; $d = 1.18$) or gratitude ($M = 3.57$, $SD = .92$, $p < .001$; $d = .80$). In response to awe narratives, participants reported more intense awe ($M = 3.86$, $SD = .87$) than admiration ($M = 3.02$, $SD = 1.19$, $p < .001$; $d = .80$) or gratitude ($M = 2.98$, $SD = 1.09$, $p < .001$; $d = .88$). In response to gratitude narratives, participants reported more intense gratitude ($M = 4.43$, $SD = .65$) than admiration ($M = 3.62$, $SD = 1.35$, $p < .001$; $d = .73$) or awe ($M = 2.89$, $SD = .91$, $p < .001$; $d = 1.92$). These effects held when scales were computed omitting the focal emotion term (e.g., “I felt admiration” for *admiration*), which could have an elevated mean due to demand characteristics.

Third, we examined the correlations between each scale and pleasantness and activation (see Figures 2 and 3). Admiration correlated weakly with both pleasantness and activation; awe correlated strongly with pleasantness, and moderately with activation; and gratitude correlated moderately with pleasantness and weakly with activation.

Fourth, to assess convergent validity, we examined the correlations between our awe and gratitude scales and existing measures of the dispositional tendency to feel these emotions (see Table S2). As predicted, dispositional awe correlated positively with momentary reports of awe following awe narratives ($r = .24, p < .001$), and dispositional gratitude correlated positively with momentary reports of gratitude following gratitude narratives ($r = .21, p < .01$).

4.2.2.2 Sample 2b

We first selected an optimal factor solution for each narrative. Consistent with our expectation that distinct factors would emerge for empathy, sympathy, and tenderness, a scree test indicated that a three-factor solution best characterized the data emerging in response to narratives of each emotion. The first five eigenvalues were as follows: in response to empathy narratives: 12.49, 5.20, 2.90, 2.36, 1.85; in response to sympathy narratives: 13.55, 4.37, 2.98, 1.98, 1.61; in response to tenderness narratives: 11.82, 8.12, 2.55, 1.98, 1.27. Across empathy, sympathy, and tenderness narratives, respectively, the first three factors explained 43%, 44%, and 47% of the variance. Across all three narratives, inspection of the four-factor solution suggested that, as in Study 1, the fourth factor captured perspective-taking which, as noted above, is considered a component of empathy in most major models of empathy (Batson et al., 1987; Davis, 1983; Decety & Cowell, 2014; Preston & DeWaal, 2002; Zaki, 2014); we therefore retained the three-factor solution, and again determined that compassion did not constitute a

unique set of subjective components.²⁵ Inspection of the thoughts, feelings, and action tendencies comprising each factor, across all three narratives, suggested that the factors represented empathy, sympathy, and tenderness, and these three factors had nearly identical content to the empathy, sympathy, and tenderness factors that emerged in Study 1. Using the item inclusion criteria outlined in Study 1, we arrived at lists of 8, 7, and 8 items, respectively, to include in self-report scales for measuring empathy, sympathy, and tenderness (α s = .81, .80, and .87, respectively; see Table 1).

We next turned our attention to examining the convergent and discriminant validity of each scale. First, we examined the scale intercorrelations (see Table S3); the empathy and sympathy scales correlated .23, .30, and .54 across empathy, sympathy, and tenderness narratives, respectively; the empathy and tenderness scales correlated .60, .66, and .29, respectively; and the sympathy and tenderness scales correlated .33, .32, and -.13, respectively. These results suggest that the three emotions all capture similar core content relating to caring for others; however, empathy and tenderness appear to be particularly strongly related, including during episodes of empathy. These findings also provide some evidence that sympathy may be antithetical to tenderness, at least during tenderness episodes.

Second, we examined the means of each scale (see Table S3). In response to empathy narratives, participants reported similar levels of empathy ($M = 3.76$, $SD = .83$) and sympathy ($M = 3.67$, $SD = .89$, $p = .20$; $d = .20$), but greater empathy than tenderness ($M = 3.20$, $SD = .94$, $p < .001$; $d = .63$). In response to sympathy narratives, participants reported more intense sympathy ($M = 3.98$, $SD = .76$) than empathy ($M = 3.48$, $SD = .90$, $p < .001$; $d = .60$) or tenderness ($M =$

²⁵ As was the case in Study 1, the item “I felt compassion” tended to show moderate loadings on all three factors in response to all three narratives ($M = .36$, $SD = .09$; Range = .18-.55), and met our loading criteria for the sympathy factor when participants wrote about sympathy, and the tenderness factor when participants wrote about tenderness. We therefore determined that the item did not uniquely capture a distinct emotion, and did not include it in any scale.

3.03, $SD = .99$, $p < .001$; $d = 1.07$). In response to tenderness narratives, participants reported more intense tenderness ($M = 3.96$, $SD = .84$) than empathy ($M = 2.89$, $SD = .96$, $p < .001$; $d = 1.19$) or sympathy ($M = 2.48$, $SD = 1.14$, $p < .001$; $d = 1.49$). These effects held when scales were computed omitting the focal emotion term (e.g., “I felt empathy” for *empathy*).

Third, we examined the correlations between each scale and pleasantness and activation (see Figures 2 and 3). Empathy correlated weakly with both pleasantness and activation; sympathy correlated strongly and negatively with pleasantness, and weakly with activation; and tenderness correlated strongly and positively with pleasantness and weakly with activation.

Fourth, to examine convergent validity, we examined correlations between our newly constructed caring emotion scales and measures of the dispositional tendency to feel caring emotions (see Table S4). As predicted, dispositional compassion correlated positively with momentary sympathy and tenderness following episodes of those emotions ($r_s = .25$ and $.26$, respectively; $p_s < .001$). Also as predicted, dispositional tenderness, measured by the PCAT, correlated positively with momentary tenderness following tenderness episodes, though this relation was stronger for positive tenderness ($r = .37$, $p < .05$) than negative tenderness ($r = .16$, $p < .05$). Finally, as predicted, dispositional perspective-taking and personal distress both correlated positively with momentary empathy and sympathy, respectively, following episodes of those emotions ($r_s = .23$ and $.15$, respectively; $p_s < .05$), and dispositional empathic concern correlated similarly with all three momentary caring emotions ($r_s = .21$ -.28; $p_s < .01$).

4.2.2.3 Sample 2c

We first selected an optimal factor solution for each narrative. Consistent with our expectation that distinct factors would emerge for contentment, amusement, and schadenfreude, a scree test indicated that a three-factor solution best characterized the data for narratives of each

emotion. The first five eigenvalues were as follows: in response to happiness narratives: 9.07, 3.82, 2.31, 1.71, 1.51; in response to contentment narratives: 11.69, 5.06, 2.15, 1.46, 1.20; in response to amusement narratives: 11.82, 5.44, 2.88, 1.33, 1.13; in response to schadenfreude narratives: 14.16, 3.68, 2.49, 1.90, 1.26. Across happiness, contentment, amusement, and schadenfreude narratives, respectively, the first three factors explained 35%, 46%, 49%, and 50% of the variance. Across all narratives, inspection of the four-factor solution suggested that the addition of a fourth factor resulted in splitting one of the other three factors, rather than the emergence of a factor constituting a distinct emotion; for example, for contentment narratives, the third and fourth factors each contained 2-3 amusement items. We therefore retained the three-factor solution, and again determined that contentment and happiness constitute the same emotional experience.

Inspection of the thoughts, feelings, and action tendencies comprising each factor, across all three narratives, suggested that the factors represented contentment, amusement, and schadenfreude, and two of these factors had nearly identical content to the contentment, amusement, and schadenfreude factors that emerged in Study 1. The only exception concerned schadenfreude; when participants wrote about schadenfreude, 6 of the 11 schadenfreude items from Study 1 had their highest primary loading on the schadenfreude factor; the other five items had their highest primary loadings on the contentment factor, which makes sense in that schadenfreude is defined as pleasure or enjoyment experienced at another person's misfortune (van Dijk, Ouwerkerk, Smith, & Cikara, 2015). From these factors, using the item inclusion criteria outlined in Study 1, we arrived at lists of 5 items each to include in self-report scales for measuring contentment, amusement, and schadenfreude ($\alpha_s = \alpha_s = .68$ and $.85$ for the

contentment scale following happiness and contentment narratives, respectively, and .79 and .90 for amusement and schadenfreude, respectively; see Table 1).

We next turned our attention to examining the convergent and discriminant validity of each scale. First, we examined the scale intercorrelations (see Table S5); the contentment and amusement scales correlated .33, .48, .42 and .59 across happiness, contentment, amusement, and schadenfreude narratives, respectively; the contentment and schadenfreude scales correlated -.28, -.12, -.12, and .35, respectively; and the amusement and schadenfreude scales were correlated .05, .18, -.10, and .35, respectively. These results suggest that contentment and amusement tend to co-occur. The picture is a bit more complex for schadenfreude, which appears somewhat antithetical to contentment, and relatively unrelated to amusement except during schadenfreude episodes when these feelings co-occur.

Second, we examined the means of each scale (see Table S5). For happiness narratives, participants reported more intense contentment ($M = 4.41$, $SD = .60$) than amusement ($M = 3.58$, $SD = .91$, $p < .001$; $d = 1.05$) or schadenfreude ($M = 1.51$, $SD = .68$, $p < .001$; $d = 4.51$). Similarly, for contentment narratives, participants reported more intense contentment ($M = 4.16$, $SD = .82$) than amusement ($M = 2.89$, $SD = 1.02$, $p < .001$; $d = 1.36$) or schadenfreude ($M = 1.49$, $SD = .71$, $p < .001$; $d = 3.47$). For amusement narratives, participants reported more intense amusement ($M = 4.26$, $SD = .75$) than contentment ($M = 3.75$, $SD = .94$, $p < .001$; $d = .60$) or schadenfreude ($M = 1.77$, $SD = .92$, $p < .001$; $d = 2.98$). For schadenfreude narratives, participants reported more intense schadenfreude ($M = 3.18$, $SD = 1.21$) than contentment ($M = 2.89$, $SD = .98$, $p < .01$; $d = .26$) or amusement ($M = 2.83$, $SD = 1.17$, $p < .001$; $d = .29$). For contentment and amusement narratives, these effects held when scales were computed omitting the focal emotion term (e.g., “I felt amusement” for *amusement*). In contrast, following

schadenfreude narratives, when the scales were re-computed omitting the focal emotion terms, participants reported equivalent levels of schadenfreude, contentment, and amusement. However, it is worth noting that the relatively low mean intensity of schadenfreude across all episodes may be due in part to the relatively low social desirability of some of the items used to measure this emotion (see Table 1), rather than the actual intensity with which schadenfreude is felt.

Third, we examined correlations between each scale and pleasantness and activation (see Figures 2 and 3). Contentment correlated strongly with pleasantness²⁶ and weakly to moderately with activation; amusement correlated strongly with both pleasantness and activation; and schadenfreude correlated weakly to moderately with both pleasantness and activation.

Fourth, to examine convergent validity, we examined correlations between our newly constructed contentment and amusement scales, and existing measures of the dispositional tendency to feel these emotions (see Table S6). As predicted, dispositional contentment and joy, as well as dispositional subjective happiness, tended to positively predict momentary happiness and contentment, following episodes of those narratives (average $r = .14$; $SD = .09$); however, these correlations showed considerable variation, ranging from near-zero ($r = .03$) to moderate ($r = .27$). Also as predicted, dispositional amusement positively predicted momentary amusement, following amusement narratives ($r = .29$, $p < .001$).

4.2.2.4 Sample 2d

We first selected an optimal factor solution for each narrative. Consistent with our expectation that distinct factors would emerge for hope, enthusiasm, and interest, a scree test indicated that a three-factor solution best characterized the data for narratives of interest;

²⁶ This correlation is inflated by the fact that the items “I feel happy” and “I feel content” are included in both our happiness/contentment scale and Barrett and Russell’s (1998) pleasantness scale. However, even if these two items are omitted from our contentment scale, the correlations with dimensional pleasantness remain strong: .55 and .68 across happiness and contentment narratives, respectively. In light of this item-level overlap, in Figure 2 we present the average correlation between contentment *without* the pleasantness items and momentary pleasantness ($r = .62$).

however, for narratives of hope and enthusiasm, a two-factor structure best characterized the data. The first five eigenvalues were as follows: in response to hope narratives: 12.44, 4.77, 2.16, 2.00, 1.59; in response to enthusiasm narratives: 10.15, 4.83, 2.25, 1.99, 1.85; in response to interest narratives: 10.54, 3.90, 3.53, 2.03, 1.48. For hope and enthusiasm narratives, the first two factors explained 38%, and 34% of the variance, respectively, and for interest narratives, the first three factors explained 40% of the variance. For hope narratives, inspection of a three-factor solution suggested that the third factor contained a mixture of hope and interest items, and for enthusiasm narratives, the third factor contained a mixture of enthusiasm and interest items; as in Study 1, interest did not emerge as a separate factor in these solutions. Additionally, across all three narratives, inspection of a four-factor solution suggested that the fourth factor primarily contained a mixture of 3-5 interest and hope items, rather than constituting a distinct emotion. We therefore retained the three-factor solution for interest narratives, and the two-factor solution for hope and enthusiasm narratives.

Inspection of the thoughts, feelings, and action tendencies comprising each factor across all three narratives suggested that the factors represented hope, enthusiasm, and interest, and these three factors had nearly identical content to the hope, enthusiasm, and interest factors that emerged in Study 1. Using the item inclusion criteria outlined in Study 1 we arrived at lists of 8, 5, and 8 items, respectively, to include in self-report scales for measuring hope, enthusiasm, and interest (α s = .69, .66, and .77, respectively; see Table 1).

We next turned to examining the convergent and discriminant validity of each scale. First, we examined the scale intercorrelations (see Table S7); the hope and enthusiasm scales were correlated .23, .37, and .43 across hope, enthusiasm, and interest narratives, respectively; the hope and interest scales correlated .50, .44, and .26, respectively; and the enthusiasm and

interest scales correlated .58, .56, and .44, respectively. These results suggest that hope and enthusiasm are moderately related across the three emotion episodes; in contrast, interest is moderately linked to hope and enthusiasm following interest episodes, but more strongly linked to these emotions following hope and enthusiasm episodes.

Second, we examined the means of each scale (see Table S7). In response to hope narratives, participants reported more intense hope ($M = 4.17$, $SD = .58$) than interest ($M = 3.52$, $SD = .89$, $p < .001$; $d = .83$) or enthusiasm ($M = 2.88$, $SD = 1.10$, $p < .001$; $d = 1.09$). In response to enthusiasm narratives, participants reported more intense enthusiasm ($M = 4.06$, $SD = .76$) than interest ($M = 3.84$, $SD = 1.72$, $p < .001$; $d = .29$) or hope ($M = 3.59$, $SD = .87$, $p < .001$; $d = .58$). In response to interest narratives, participants reported more intense interest ($M = 4.26$, $SD = .60$) than hope ($M = 3.35$, $SD = .95$, $p < .001$; $d = 1.12$) or enthusiasm ($M = 3.28$, $SD = .91$, $p < .001$; $d = 1.23$). The majority of these effects held when scales were computed omitting the focal emotion term (e.g., “I felt hope” for *hope*); however, without the focal emotion terms, participants did not report more intense enthusiasm than interest following enthusiasm episodes.

Third, we examined the correlations between each scale and pleasantness and activation (see Figures 2 and 3). Hope correlated near-zero with pleasantness, and weakly with activation; enthusiasm correlated moderately to strongly with pleasantness and very strongly with activation; finally, interest correlated weakly to moderately with both pleasantness and activation.

Fourth, we examined the correlations between our interest and hope scales, and existing measures of the dispositional tendency to feel states related to these emotions (see Table S8). As predicted, trait curiosity positively predicted momentary interest following episodes of interest ($r = .31$, $p < .001$), though trait optimism did not correlate strongly with momentary hope following

episodes of hope ($r = .10, p = .14$). This latter result could be due to the fact that the trait measure of optimism emphasizes holding a positive outlook on life, whereas our hope scale captures a feeling of being challenged and, which could engender both a positive and a negative outlook, depending on one's perceived capability to overcome the challenge. This distinction, between holding an overtly positive outlook and feeling challenged, is often made in differentiating optimism and hope (e.g., Cheavens & Ritschel, 2014; Lazarus, 1999; Snyder, 2002).

4.2.2.5 Sample 2e

We first selected an optimal factor solution for each narrative. Consistent with our expectation that distinct factors would emerge for romantic love, attachment love, and nurturant love, a scree test indicated that a three-factor solution best characterized the data for narratives of each emotion. The first five eigenvalues were as follows: in response to romantic love narratives: 24.05, 4.57, 2.77, 1.61, 1.33; in response to attachment love narratives: 15.95, 6.64, 3.99, 2.13, 1.84; in response to nurturant love narratives: 13.36, 9.81, 4.16, 1.74, 1.51. Across romantic love, attachment love, and nurturant love, respectively, the first three factors explained 55%, 45%, and 47% of the variance. Across all three narratives, inspection of the four-factor solution suggested that the fourth factor contained no more than one item that met our loading criteria; we therefore retained the three-factor solution, and again determined that *love* does not constitute a distinct emotional experience, above and beyond its three subtypes of attachment, nurturant, and romantic love.

Inspection of the thoughts, feelings, and action tendencies constituting each factor across all three narratives suggested that the factors represented romantic love, attachment love, and nurturant love, and these three factors had nearly identical content to the same three factors emerging from Study 1. Using the item inclusion criteria outlined in Study 1, we arrived at lists

of 8, 7, and 7 items, respectively, to include in self-report scales for measuring romantic love, nurturant love, and attachment love (α s = .84, .87, and .89, respectively; see Table 1). Notably, we did not include any of the focal emotion items in our scales; these items never met our loading criteria on the focal emotion factor, and throughout testing we found that many participants did not know the meaning of these items.

We next examined the convergent and discriminant validity of each scale. First, we examined the scale intercorrelations (see Table S9); the romantic and attachment love scales correlated .43, .09, and .20 across romantic love, attachment love, and nurturant love experiences, respectively; the romantic and nurturant love scales correlated .64, .36, and .35, respectively; and the attachment and nurturant love scales correlated .69, .48, and -.07, respectively. These results suggest that when individuals recall romantic love experiences, their recollections of all three types of love are tightly linked; in particular, nurturant love is strongly tied to romantic and attachment love during episodes of these two emotions. In contrast, the three types of love are more modestly linked across attachment and nurturant love episodes, and attachment and nurturant love may be orthogonal during nurturant love episodes.

Second, we examined the means of each scale (see Table S9). For romantic love narratives, participants actually reported *less* romantic love ($M = 3.39$, $SD = .94$) than attachment love ($M = 4.07$, $SD = .94$, $p < .001$; $d = .72$) or nurturant love ($M = 3.75$, $SD = .95$, $p < .001$; $d = .38$). Importantly, however, participants reported more intense romantic love when asked to recall romantic love compared to when they were asked to recall either other form of love (p s < .001; d s > .76). For attachment love narratives, participants reported more intense attachment love ($M = 3.86$, $SD = .92$) than romantic ($M = 2.66$, $SD = 1.02$, $p < .001$; $d = 1.23$) or nurturant love ($M = 3.55$, $SD = .96$, $p < .001$; $d = .32$). For nurturant love narratives, participants reported

more intense nurturant love ($M = 3.50$, $SD = 1.12$) than romantic love ($M = 2.07$, $SD = .79$, $p < .001$; $d = 1.45$), but less intense nurturant love than attachment love ($M = 3.96$, $SD = .87$, $p < .001$; $d = .47$); notably, participants also reported less intense nurturant love when asked to recall nurturant love then when asked to recall attachment love, though this did not reach the statistical significance threshold ($p = .40$; $d = .07$). Together, these results suggest that attachment love may be the most intensely experienced form of love, and, perhaps, that the majority of love episodes—regardless of whether they concern a romantic partner, dependent, or close companion—involve at least a modest feeling of attachment with one’s love object. However, as was the case with schadenfreude above, it is also possible that the relatively low mean intensity of romantic love—compared to attachment and nurturant love—is due partly to the relatively low social desirability of some of these items (e.g., “I felt vulnerable” and “I was afraid of rejection”) compared to the generally socially desirable items that constitute the attachment and nurturant love scales.

Third, we examined correlations between each scale and pleasantness and activation (see Figures 2 and 3). Romantic love correlated weakly with pleasantness and moderately to strongly with activation; attachment love correlated strongly and positively with pleasantness, and moderately with activation; finally, nurturant love correlated moderately to strongly with both pleasantness and activation.

Fourth, we examined correlations between each of these scales and established measures of traits that predispose people to feel the three forms of love (see Table S10). As predicted, dispositional love positively predicted momentary attachment love ($r_s = .22$, $p < .01$) and dispositional romantic love positively predicted momentary romantic love ($r = .42$, $p < .001$), respectively, following episodes of these emotions. Also as predicted, dispositional anxious

attachment style with one's romantic partner and best friend positively predicted momentary romantic love ($r_s = .25$ and $.17$, respectively, $p_s < .01$). Finally, as predicted, dispositional avoidant attachment style with one's romantic partner and best friend negatively predicted momentary attachment love ($r_s = -.17$ and $-.38$, respectively, $p_s < .05$).²⁷

4.2.3 Discussion and interim summary

In Study 2, we used factor analysis to select a set of central subjective components which captured the core content of each of 15 positive emotions across Studies 1 and 2, and used these components to construct scales for each emotion. The resultant scales constitute the first empirically based representation of the subjective content of the majority of positive emotions frequently studied in the literature, or the full range of thoughts, feelings, and action tendencies that constitute these emotions as experienced by lay persons (see Table 1). We also took several initial steps to validate these new scales and construct a nomological network for each.

First, we found that, on average, the emotions within each category tended to show moderate intercorrelations, which we would expect given that they were grouped based on conceptual similarity. Second, by and large when participants wrote about an emotional episode focused on one distinct emotion, they tended to report more intense levels of that emotion compared to other emotions within the same category, which we would expect if our scales uniquely captured one positive emotion. There were, however, exceptions to these trends. For example, empathy and tenderness showed considerable overlap following episodes of empathy. As another example, episodes of romantic love elicited higher levels of attachment and nurturant love than romantic love, and episodes of nurturant love elicited higher levels of attachment love than nurturant love. These exceptions suggest areas in which experiences of one positive emotion may elicit a mixture of several positive emotions typically considered distinct, pointing to the

²⁷ In contrast, attachment style with one's mother and father correlated near-zero with all three forms of love.

need to empirically assess the distinctiveness of all positive emotions, to which we will turn in Part 2.

Third, although each of the 15 emotions for which we constructed scales is typically considered to be a “positive” emotion, we found considerable variability in their correlations with momentary pleasant and activated mood. Correlations between positive emotions and pleasantness were moderate and positive on average, but ranged from strong and negative (i.e., sympathy) to strong and positive (i.e., contentment, attachment love), and included several emotions experienced as valence-neutral (i.e., empathy, hope; see Figure 2).²⁸ Correlations between positive emotions and activation were weak and positive on average, but also showed considerable variability, ranging from relatively neutral (i.e., contentment, gratitude, sympathy) to highly activated (i.e., romantic love, enthusiasm; see Figure 3).

Fourth, based on correlations between our newly constructed scales and previously developed measures of the dispositional tendency to experience the same or similar emotional states, our scales demonstrated convergent validity. They did not, however, show as strong discriminant validity. Many of the dispositional emotional measures we examined showed correlations of a similar magnitude with all the emotions in a given category. For example, dispositional awe correlated positively with momentary admiration and gratitude, as well as awe; proneness to tenderness correlated positively with momentary empathy and sympathy, as well as tenderness; and trait amusement correlated positively with momentary contentment and schadenfreude, as well as amusement (see Tables S1-S10). These correlations could have

²⁸ Figures 2 and 3 also include correlations of momentary pleasantness and activation with authentic and hubristic pride, for the sake of completeness. These correlations were taken from unpublished data associated with a prior published article (Tracy & Robins, 2007, Study 3). In this study, participants were asked to write about a prior experience in which they felt pride and subsequently reported their feelings of authentic and hubristic pride (using the Authentic and Hubristic Pride Scales; Tracy & Robins, 2007) and pleasantness and activation (using the mood scales developed by Barrett & Russell, 1998).

resulted from our scales failing to capture content distinct to each emotion; however, given the evidence observed for distinctiveness among these emotions at the state level, they are more likely due to a limitation inherent to the dispositional scales and to the assessment of dispositional emotions, broadly speaking. When individuals report their general tendencies to feel distinct positive emotions, they may have trouble differentiating their tendency to experience that particular emotion from a broader tendency toward all positive emotions, and, perhaps more important, individuals likely vary more in their dispositional tendencies to experience all positive emotions (i.e., on dispositional positive affect) than their tendencies to feel specific positive emotions (e.g., dispositional awe). If this is the case, individuals' chronic level of positive emotional experience may uniformly affect their experience of multiple distinct positive emotion dispositions, causing these dispositions to relate uniformly to momentary positive emotions. Both of these explanations are consistent with prior findings that scales meant to capture distinct positive emotion dispositions typically show very strong positive intercorrelations (Shiota et al., 2006).

We have thus far uncovered the core thoughts, feelings, and action tendencies that constitute 15 distinct positive which are frequently studied in contemporary affective science (see Table 1). On the basis of these subjective components, we constructed short, reliable self-report scales to measure each, and provided initial evidence for their validity. In addition, we examined links between each distinct positive emotion and closely related emotional dispositions, as well as dimensional pleasantness and activation (see Figures 2 and 3). Although this systematic process provided the first empirical analysis of the experiential content of a wide range of positive emotions as they are experienced by lay persons, it also involved studying each emotion in isolation from the majority of other emotions. As a result, we have yet to examine

interrelations among *all* positive emotions, which would help gauge the extent to which each positive emotion is experienced distinctly from other positive emotions.

Addressing this issue was the primary goal of Part 2. In Studies 3-5, we assessed the extent to which each of the 15 emotions for which we constructed scales in Part 1, as well pride, are experienced distinctly at the state and trait levels. Pride has been examined extensively in prior work, and takes two distinct forms: authentic (i.e., feeling accomplished, confident, and self-worthy) and hubristic (i.e., feeling arrogant, pompous, and stuck-up; Tracy & Robins, 2007). We did not include pride in Studies 1 or 2 because the central goals of those studies (i.e., identifying the content of each emotion, linking each to related constructs, and developing scales) had already been accomplished for pride (Carver, Sinclair, & Johnson, 2010; Tracy & Robins, 2007; Tracy, Cheng, Robins, & Trzesniewski, 2009). However, prior research has not examined the relations between pride and all other positive emotions, so we included pride in Part 2, specifically in Study 4.²⁹

Studies 3 and 4 addressed the question of distinctness at the level of momentary emotional experiences. In Study 3, participants wrote about a pleasant emotional experience in a social situation and reported their feelings using all 15 scales developed in Studies 1 and 2. We asked participants to write about an ambiguously pleasant experience rather than a particular targeted emotion because we wished to examine interrelations among distinct positive emotions in a situation that did not necessarily elicit high levels of one particular emotion. In contrast, in Study 4, we returned to more specific emotional scenarios, asking participants to recall instances in which they experienced one of 17 distinct positive emotions, and then to report their subjective experience of all 17 of emotions during the experience. Together, Studies 3 and 4

²⁹ Pride was inadvertently omitted from Studies 3 and 5.

therefore allowed us to examine the landscape of positive emotions across broad vs. narrow emotional situations.

Finally, in Study 5, we examined interrelations among the dispositional propensity to experience distinct positive emotions. Study 5 also allowed us to examine relations between trait-like positive emotional experiences and a range of other behavioral and affective dispositions; we therefore also assessed the dispositional tendency to experience positive and negative affect, self-esteem, the Big Five factors of personality, and narcissism. Examining these relations allowed us to further a goal initiated in Study 2, of situating each distinct positive emotion within a nomological network of cognitive, affective, and behavioral characteristics.

When presenting the results for Studies 3-5, we highlight correlations between positive emotions that exceeded .60; not only are correlations of this magnitude considered large by typical psychological standards (Cohen, 1992), but they exceed the magnitude generally observed for the correlation between shame and guilt (i.e., .40-.60; Tangney & Dearing, 2002), which, to our knowledge, is the largest magnitude of correlation observed between two emotions that nonetheless show strong evidence of distinctiveness (see, e.g., Paulhus, Robins, Trzesniewski, & Tracy, 2004; Tangney & Dearing, 2002). Correlations near or above .60 may therefore indicate an upper limit for considering any two emotions as distinct.

4.3 Study 3

4.3.1 Method

4.3.1.1 Participants and procedure

Three-hundred fifty adults were recruited to participate through Amazon Mechanical Turk (MTurk). Forty-seven (13%) were excluded for either failing to write about an emotional experience (e.g., copying and pasting a stock paragraph about emotion theory) or failing

attention check questions, leaving a final sample of 303 participants (M age = 36.09; SD = 11.99; Range = 20-74; 51% women; 66% Caucasian, 10% East Asian, 8% African American, 5% Hispanic/Latino; 11% Other). Participants were asked to think back on an occasion when they experienced a pleasant emotion in a social situation, and spend five minutes writing about that experience. They then reported the extent to which all 101 items on the 15 positive emotion scales developed in Study 2 characterized their emotional experience, on a five-point scale (1 = “not at all”; 5 = “very much”).

4.3.2 Results

4.3.2.1 Scale properties

Scale internal consistencies and mean intensities are displayed in Table 2. All scales showed excellent reliability (α s = .79-.91, M = .84, SD = .03). Scale means showed considerable variation, ranging from very weak (e.g., sympathy and schadenfreude) to very strong (e.g., contentment and interest; overall M = 3.16; SD = .68).

4.3.2.2 Intercorrelations

Scale intercorrelations, displayed in Table 2, tended to be quite high (M = .49, SD = .20), with over one third (36; 34%) exceeding .60. These extremely high intercorrelations were spread fairly evenly across the 15 emotions; 12 emotions showed two or more intercorrelations above .60 (M across emotions = 4.80 correlations above .60; SD = 2.73), with gratitude and hope demonstrating the greatest amount of extreme overlap with other emotions—eight correlations above .60 each.

4.3.2.3 Short scales

The substantial overlap among emotions resulted primarily from moderate positive correlations among the majority of the 101 scale items (M intercorrelation among items = .28,

$SD = .15$). As a result, we sought to construct short versions of each scale using the items with the highest discriminant validity, while seeking to maintain good internal consistency. First, we selected the three items from each of the full-length scales that had the lowest average correlations with all other items in the data set, excluding items on the same scale (e.g., the average correlation between the item “I felt admiration” and the other 96 non-admiration scale items in the data set). Next, we computed the internal consistency for these three-item composites; if this value fell at $.70$ or above, then the composite was used as the short scale for the given emotion. If the internal consistency fell below $.70$, we added the item with the fourth-lowest correlation with all other items in the data set, and re-computed the internal consistency. If the internal consistency was still below $.70$, we then added the item with the fifth-lowest correlation with all other items.³⁰

This process yielded short, 3-5 item scales for each emotion, which showed good internal consistency ($M = .74$; $SD = .04$; $\alpha s = .68-.84$; see Table 2). Importantly, the short scales appeared to capture highly similar constructs as the full scales; correlations between the full and short version of each scale exceeded $.85$ ($M = .92$; $SD = .03$; see Table 3). Additionally, the correlation between the profile of means across the full and short versions of all scales was $.97$.

4.3.2.4 Short scale intercorrelations

We next turned our attention to determining the extent to which each of these emotions—as assessed with the short scales—showed empirical overlap. As expected, short scale intercorrelations were substantially attenuated compared to full scale correlations (M across emotions = $.37$; $SD = .20$; see Table 2); only 11 (10%) exceeded $.60$. Furthermore, when the

³⁰ The one exception to this stopping rule concerned the contentment scale. We settled on a three-item composite to measure this emotion even though this composite showed an internal consistency of $.68$. We made this decision to avoid using either “I felt happy” or “I felt content” as scale items, given that these items are also typically used to assess the emotional dimension of pleasantness (Barrett & Russell, 1998).

correction for attenuation was applied to the average intercorrelation among the full-length and short scales, using the average internal consistency across scales, the resultant estimation of the true scale intercorrelation was lower for the short scales ($r = .50$) than the full-length scales ($r = .58$), suggesting that the short scales showed greater discriminant validity for reasons other than their lower internal consistency.

Despite this greater discriminant validity, there were a number of high correlations, pointing to emotions that may not be experienced distinctly. First, and most notably, several emotions related to caring and loving overlapped considerably; for example, tenderness correlated strongly with attachment love ($r = .70$) and nurturant love ($r = .63$), and nurturant love also correlated strongly with empathy ($r = .64$). Second, admiration correlated strongly with three emotions—hope ($r = .68$), empathy ($r = .63$), and nurturant love ($r = .62$), and also gratitude ($r = .57$). Third, hope showed strong correlations with two other emotions, in addition to admiration: awe ($r = .60$) and enthusiasm ($r = .62$).

4.3.2 Discussion

In Study 3, we examined interrelations among a broad range of positive emotions currently studied in the literature during a single pleasant emotional episode. These emotions showed considerable overlap when assessed with our full-length scales, leading us to create shorter, 3-5 item scales for each emotion (see Table 1). These scales showed a more moderate degree of overlap on average, though several areas of strong overlap remained, most notably among attachment love, empathy, nurturant love, and tenderness, as well as between admiration and hope and other positive emotions. These findings indicate areas of the positive emotion landscape where emotions that are often treated as distinct may in fact overlap considerably.

More broadly, these results suggest that positive emotions may not be experienced particularly distinctly in broad, pleasant situations that do not focus on one emotion. This result may mean that in such situations, people's moods are characterized by general, pleasant affect, or a mix of several different positive emotions, rather than the very specific experience of one distinct emotion. It also may be the case that, when reflecting on ambiguous pleasant situations, people simply do not make fine-grained distinctions between distinct emotions, instead characterizing their feelings in terms of general pleasantness.

Importantly, however, several scale means for individual emotions were relatively low in Study 3, including two that were below 2 on a 5-point scale (i.e., sympathy: $M = 1.73$; schadenfreude: $M = 1.68$). It would be premature to draw strong conclusions about the relative distinctiveness of positive emotions based entirely on responses to a scenario that did not elicit a considerable amount of each emotion in question, and may have largely elicited reports of general, undifferentiated pleasant affect. To address this limitation, in Study 4 we examined relations among all distinct positive emotions repeatedly, across scenarios meant to primarily elicit one particular emotion.

Given that the short versions of our newly constructed scales captured more distinct variants of each positive emotion in Study 3—and correlated near-unity with their respective full-length scales—we employed them moving forward, and recommend their use for future investigators. However, the average internal consistency of the short scales was—though adequate to good—lower than that of the full scales ($M_{\text{Short}} = .74$, $M_{\text{Full}} = .84$). As a result, both versions might be useful, depending on researchers' desire to use a more reliable measure versus a measure that captures content more exclusive to each particular emotion.

4.4 Study 4

4.4.1 Method

4.4.1.1 Participants and procedure

A total of 2,390 individuals participated in Study 4; 1985 were undergraduate students participating in exchange for course credit, of whom 106 (5%) were dropped for failing to pass attention check items, leaving 1,879 (M age = 20.13; SD = 3.41; 74% women). The remaining participants were 405 MTurk workers, of whom 32 (8%) were dropped for failing to pass attention check items or failing to write about a past emotional experience, leaving 373 (M age = 35.22; SD = 11.81; 48% women; 61% Caucasian, 20% South Asian; 7% East Asian; 4% Hispanic/Latino; 4% African American; 2% Other). This left a total of 2,252 participants for inclusion in Study 4.

Each participant completed the RET twice, for two different positive emotions, randomly selected from the 15 for which we had constructed scales in Study 2, plus authentic and hubristic pride. In each case, participants read a short definition of the emotion they were asked to recall, based on items taken from the longer scales developed for each emotion but not included in the short scales used here (e.g., participants instructed to recall an episode of admiration were also told, “By admiration, we mean a situation in which you felt a great deal of respect for a specific person, strongly valued that person’s opinion, and wanted to strive to emulate that person.”) Instructions for authentic and hubristic pride were drawn from Ashton-James and Tracy (2012), Study 1. By defining emotions using items drawn from the longer scales, we ensured that participants were actually writing about the emotion in question, supporting the internal validity of their responses.

For each narrative, participants recalled an experience of the corresponding emotion and then reported the extent to which the each of the 53 items on the short versions of our newly constructed scales plus the 14 items on the authentic and hubristic pride scales (Tracy & Robins, 2007) characterized their feelings during the emotional situation.³¹

4.4.2 Results

4.4.2.1 Scale properties

The short scales used to measure each positive emotion showed adequate to good internal consistency, with 12 (80%) exceeding .60 (α s = .57-.71; $M = .65$, $SD = .05$), though most were lower than in Study 3, where the M alpha was .74 (see Tables S11-S27). The lower average scale reliability here is likely due in part to the fact that the short scales were constructed in Study 3 with the explicit goal of achieving reliability of .70 or above.

4.4.2.2 Intercorrelations

Correlations between each targeted positive emotion in a given narrative and every other positive emotion experienced during that narrative tended to be weak and positive ($M = .12$), yet variable ($SD = .21$; Range = -.46 to .66; see Tables S11-S27). This finding contrasts with that of Study 3, when participants wrote about broad, rather than targeted, emotional experiences, and the average intercorrelation was .37. Importantly, this increased discriminant validity was not due entirely to lower scale internal consistencies. When the correction for attenuation was applied to the average intercorrelation among the scales in Studies 3 and 4, using the average

³¹ Ratings of pride were collected only following episodes of authentic pride, hubristic pride, attachment love, interest, and hope. This decision was made because, initially, ratings of pride were collected only following episodes of authentic and hubristic pride, but interest, attachment love, and hope correlated strongly with authentic pride following episodes of authentic pride (all r s > .30), suggesting a high degree of covariation. To determine whether this overlap was due to a lack of distinctiveness or to authentic pride episodes producing high levels of these other three emotions, we subsequently elicited new episodes of attachment love, interest, and hope, and collected ratings of authentic and hubristic pride following both (hubristic pride did not correlate particularly strongly with any other emotions following episodes of hubristic pride). Only results for the second set of narratives obtained for these three emotions are presented here, but no major differences emerged from what was found in the original set.

internal consistency across scales, the resultant estimation of the true scale intercorrelation was substantially lower in Study 4 ($r = .18$) than Study 3 ($r = .50$).

Several areas of overlap did emerge, however. First, following episodes of empathy, tenderness, romantic love, nurturant love, and attachment love, these five emotions tended to correlate moderately and positively ($M = .27$; $SD = .20$); three of these correlations exceeded .50 (tenderness and attachment love following tenderness and attachment love narratives, $r_s = .54$ and $.52$, respectively; romantic love and tenderness following romantic love narratives, $r = .54$). Second, enthusiasm and contentment correlated .60 following enthusiasm episodes. Third, although interest showed no strong correlations with other positive emotions following interest episodes, it correlated above .40 with five emotions following episodes of those emotions (i.e., admiration, awe, tenderness, romantic love, nurturant love).

4.4.2.3 Scale means

We next examined whether episodes of each positive emotion were characterized primarily by that emotion, by comparing mean levels of the positive emotion recalled to mean levels of the other positive emotions reported following that narrative (see Tables S11-S27). In 13 (76%) of the 17 narratives, the recalled emotion was reported at the highest intensity. For 12 of these (92%), participants reported significantly more intense levels of the recalled emotion compared to the second most intensely reported emotion (and, by extension, the other emotions). Crucially, these findings are not due to demand characteristics; none of the scales used to measure positive emotions in Study 4 included the words used to elicit that emotion during the RET (e.g., the admiration scale did not include the item “I felt admiration”).

However, several departures from this general pattern are worth noting. First, when romantic love was recalled, participants reported a lower intensity of romantic love ($M = 3.64$;

$SD = .82$) than five other positive emotions (tenderness, interest, attachment love, contentment, and nurturant love; M s = 3.69-4.29). Second, when enthusiasm was recalled, participants reported less intense enthusiasm ($M = 3.85$; $SD = .87$) than contentment ($M = 4.11$, $SD = .72$) or interest ($M = 4.03$, $SD = .75$). Third, following episodes of awe, participants reported less intense awe ($M = 3.83$; $SD = .86$) than interest ($M = 4.16$; $SD = .76$) or contentment ($M = 4.02$; $SD = .95$). Fourth, following episodes of hubristic pride, reports of four other emotions (i.e., authentic pride, interest, contentment, and hope; M s = 3.32-3.88) were more intense than reports of hubristic pride ($M = 3.29$, $SD = .93$). Finally, when empathy was recalled, reports of interest ($M = 4.02$, $SD = .77$) and nurturant love ($M = 4.01$, $SD = .70$) were as intense as reports of empathy ($M = 4.04$, $SD = .77$).

4.4.3 Discussion

Study 4 allowed us to examine interrelations among the full range of distinct positive emotions during episodes meant to focus narrowly on one positive emotion. Whereas Study 3 suggested that positive emotions show considerable overlap during pleasant situations that likely elicit broad positive affect, Study 4 showed that positive emotions are experienced relatively distinctly during these narrower episodes that are centered on one positive emotion. Most recalled positive emotions showed relatively modest interrelations with other positive emotions, and were reported at a greater intensity than other positive emotions.

Even in these more narrowly defined situations, however, certain emotions showed considerable overlap. First, and most notably, consistent with the results of Study 3, several emotions related to caring for and loving others (i.e., empathy, tenderness, nurturant love, and attachment love) consistently showed intercorrelations of a large magnitude (Cohen, 1992). Second, feelings of interest appeared to co-occur with of several other positive emotions during

experiences of those other emotions. Although some of these results are consistent with prior work (i.e., the link between interest and awe; Anderson, Gordon, Stellar, McNeil, Green, Monroy, & Keltner, 2016), some are not, and merit further consideration (i.e., the link between admiration and interest).

4.5 Study 5

We have thus far conceptualized distinct positive emotions as states, or momentary feelings that people experience. Although this conceptualization of emotion is most prevalent, individual differences also exist in people's trait-like propensity to experience emotions, and research into dispositional emotional experience has proven fruitful (e.g., Haidt, McCauley, & Rozin, 1994; Lange & Cruisius, 2015; Lyubomirsky & Lepper, 1999; McCullough et al., 2002; Tangney, Dearing, Wagner, & Gramzow, 2000; Tracy & Robins, 2007). In Study 5, we sought to examine the interrelations among the dispositional propensity to experience positive emotions.

In light of the results indicating that positive emotions showed greater overlap during broadly defined pleasant situations (Study 3) than more specific positive emotional situations (Study 4), we anticipated considerable overlap in individuals' dispositional propensity to experience various positive emotions. Specifically, we expected that individuals asked to report on their trait-like emotional experience might draw primarily on semantic knowledge about their general emotional experiences, rather than recall particular circumscribed situations centering on any one distinct emotion (Robinson & Clore, 2002), producing blended reports of multiple positive emotions. This expectation is consistent with prior work demonstrating considerable overlap among trait positive emotions (e.g., Shiota et al., 2006). Furthermore, trait-like individual differences in positive mood may emerge primarily along the dimension of pleasantness, rather than along distinct emotional dimensions, such that those who tend to be

high in pleasantness are prone to a wide range of positive emotions, with less variation among those who are particularly prone to awe versus tenderness versus gratitude. If this is the case, then we would likely see stronger correlations between dispositions toward each distinct positive emotion compared to those that emerged between momentary reports of each emotion.

A second goal of Study 5 was to examine relations between dispositional positive emotional experience and several other behavioral and affective traits, in order to further the goal initiated in Study 2 of situating each distinct positive emotion within a nomological network of related cognitive, affective, and behavioral characteristics.

4.5.1 Method

4.5.1.1 Participants and procedure

A total of 388 adults were recruited to participate through MTurk. Thirty-nine (8%) were excluded for failing attention check questions, leaving a final sample of 349 (M age = 37.83; SD = 12.27; Range = 18-76; 56% women; 69% Caucasian, 10% East Asian, 7% African American, 3% Hispanic/Latino; 11% Other). Participants reported the extent to which each of the 53 items on the 15 short positive emotion scales developed in Study 3 “characterizes your everyday feelings”, on a five-point scale (1 = “not at all”; 5 = “very much”),³² then completed a series of personality questionnaires.

4.5.1.2 Personality measures

Participants completed the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; α s = .91 and .94 for PA and NA); the Big Five Inventory (BFI; John et al., 2008; α s = .83-91 for the five traits); the Rosenberg Self-Esteem Scale (RSE; Rosenberg,

³² For exploratory purposes, we included the full set of 101 items comprising the 15 full-length scales. However, full-length scales were not the focus of our analyses, and therefore are not discussed further. Intercorrelations among full-length positive emotion scales are nonetheless presented in Table 4 alongside intercorrelations among the short scales.

1965; $\alpha = .92$); and the Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back, Küfner, Dufner, Gerlach, Rauthmann, & Denissen, 2013; α s = .90 and .87 for Narcissistic Admiration and Narcissistic Rivalry, respectively). These measures were included because they are among the most frequently studied affective traits in the personality literature, and have been shown to be importantly linked to a range of affective constructs (e.g., Costa & McCrae, 1980; Sowislo & Orth, 2013; Tracy, Cheng, Martens, & Robins, 2011; Tracy et al., 2009; Watson & Clark, 1984; 1997).

4.5.2 Results

4.5.2.1 Scale properties

Scale internal consistencies and mean intensities are displayed in Table 4. The short scales tended to show good reliability, although four fell below .70 (α s = .54-.84; $M = .73$, $SD = .09$); average reliability was nearly identical to that observed in Study 3 ($M = .74$), but higher than that observed in Study 4 ($M = .65$). Scale means tended to be in the moderate range, and showed less variability than in Study 3 ($M = 3.32$, $SD = .47$).

4.5.2.2 Intercorrelations

Scale intercorrelations were generally quite strong ($M = .46$, $SD = .19$; see Table 4). Nearly one-quarter of correlations (24; 23%) exceeded .60, and 13 emotional dispositions had at least one external correlation above .60 ($M = 3.20$; $SD = 2.54$). This decreased discriminant validity from Studies 3 and 4 was not due to differences in scale reliabilities; when the correction for attenuation was applied to the average intercorrelation among the scales in Studies 3, 4, and 5, using the average internal consistency across scales, the resultant estimation of the true scale intercorrelation was higher in Study 5 ($r = .63$), than in Studies 3 or 4 (r s = .50 and .18, respectively).

4.5.2.3 Nomological network

With respect to positive and negative affect, not surprisingly, positive emotional dispositions tended to relate strongly and positively to PA ($M = .48$, $SD = .22$; see Table 5 and Figures 4 and 5 for all correlations reported in this section).³³ However, as was the case for correlations with momentary pleasantness observed in Study 2, correlations with PA were quite variable, ranging from weak (e.g., romantic love, schadenfreude, and sympathy; $r_s < .19$) to very strong (e.g., authentic pride, attachment love, enthusiasm; $r_s > .61$). The positive emotional dispositions also tended to correlate near zero with NA ($M = .00$, $SD = .26$). However, five emotions suggested a more mixed affective profile at the trait level: hubristic pride, romantic love, sympathy, schadenfreude, and awe all showed positive correlations with both PA ($r_s = .08$ -.37) and NA ($r_s = .25$ -.51); these five states will henceforth be referred to as *mixed-affective emotions*.

With respect to the Big Five personality traits, The positive emotional dispositions tended to correlate moderately and positively with extraversion, agreeableness, conscientiousness, and openness ($M_s = .23$ -.29; $SD_s = .13$ -.25) and moderately and negatively with neuroticism ($M = -.18$; $SD = .25$). The mixed-affective emotions bucked this trend, however; three showed positive correlations with neuroticism (romantic love, sympathy and schadenfreude; $r_s = .38$, .11 and .17, respectively), and relatively weak or negative correlations with the other Big Five traits ($r_s = -.23$ to .11). Additionally, awe correlated near-zero with neuroticism, agreeableness, and conscientiousness ($r_s = -.01$ to .02), and only weakly and positively with extraversion and openness to experience ($r_s = .21$ and .13, respectively). Similarly, prior studies have shown that

³³ Figures 4 and 5 also present correlations between authentic and hubristic pride with positive and negative affect, for inclusiveness. These were taken from an additional sample of 101 MTurk workers (M age = 33.03, $SD = 9.98$, 40% women, 71% Caucasian) who were asked to report how much they typically felt authentic and hubristic pride (using the Authentic and Hubristic Pride Scales; Tracy & Robins, 2007), and positive and negative affect (using the PANAS; Watson et al., 1988).

hubristic pride correlates negatively with agreeableness and conscientiousness ($r_s = -.26$ and $-.25$, respectively), weakly and positively with extraversion ($r = .11$), and near-zero with neuroticism and openness ($r_s = .05$ and $.01$, respectively; Tracy & Robins, 2007).

With respect to self-esteem, the positive emotional dispositions tended to correlate positively with self-esteem, though these correlations showed considerable variability ($M_s = .25$; $SD_s = .28$). Happiness and attachment love correlated most strongly and positively with self-esteem ($r_s = .53$ -. 56); prior work has shown that authentic pride has a similarly strong correlation with self-esteem ($r = .50$; Tracy & Robins, 2007). The mixed-affective emotions were characterized by a different pattern: romantic love, schadenfreude, and sympathy correlated negatively with self-esteem ($r_s = -.33$, $-.16$, and $-.11$, respectively)—a finding that has also emerged previously for hubristic pride ($r = -.14$; Tracy & Robins, 2007)—and awe showed a near-zero correlation with self-esteem ($r = -.02$).

With respect to narcissism, the positive emotional dispositions tended to correlate moderately and positively with narcissistic admiration, which has been shown to capture a more adaptive side of narcissism (Back et al., 2013; *Mean* $r = .31$, $SD = .12$); schadenfreude, enthusiasm, and contentment were the most strongly correlated with this disposition ($r_s = .34$, $.57$ and $.43$, respectively). In addition, prior work has shown that both authentic and hubristic pride correlate positively with the Narcissistic Personality Inventory ($r_s = .32$ and $.22$, respectively; Tracy & Robins, 2007), which primarily captures adaptive narcissism (Ackerman, Witt, Donnellan, Trzesniewski, Robins, & Kashy, 2011; Back et al., 2013). In contrast, the positive emotional dispositions correlated near zero on average with narcissistic rivalry, which is thought to capture the more dysfunctional side of narcissism (Back et al., 2013; *Mean* $r = -.03$; $SD = .22$). However, schadenfreude showed a strong positive correlation ($r_s = .47$) and romantic

love and awe also showed weak, positive correlations ($r = .29$ and $.26$, respectively); similarly, prior work has shown that hubristic pride correlates positively with Narcissistic Personality Disorder which, like narcissistic rivalry, is a more dysfunctional form of narcissism ($r = .26$; Tracy et al., 2009).

4.5.3 Discussion

Our primary goal in Study 5 was to examine interrelations among the dispositional propensity to experience each positive emotion. Trait positive emotions showed strong interrelations—stronger than those observed for state positive emotions in Studies 3 and 4. These findings suggest that positive emotions may not be experienced particularly distinctly at the dispositional level, both because individual differences in positive mood emerge primarily along the dimension of pleasantness rather than distinct emotional dimensions, and because people may not distinguish between distinct positive emotions when reporting their dispositional emotional experience. Nonetheless, the results of Study 5 raise questions about researchers' ability to assess positive emotions distinctively at the dispositional level.

A second goal of Study 5 was to examine relations between trait positive emotional dispositions and related affective and behavioral dispositions. These analyses yielded several notable findings. First, though all emotions correlated positively with trait positive affect, substantial variability emerged, with correlations ranging from very weak to very strong (see Figure 4). This result replicates a finding of Study 2, and again suggests that not all “positive emotions” are experienced as equally pleasant or positive.

Second, although most positive emotional dispositions correlated negatively with trait negative affect, five emotions—hubristic pride, romantic love, sympathy, schadenfreude, and awe—correlated positively, suggesting that these states may be characterized by a mixed-valence

experience (see Figure 5). Along the same lines, these mixed affective emotions tended to show weak associations with the socially desirable Big Five traits and self-esteem, whereas the other 11 positive emotions correlated positively with the socially desirable poles of the Big Five traits and self-esteem. More broadly, the finding that a set of 17 positive emotions—all of which correlated positively with trait positive affect—showed relatively mixed correlations with negative affect supports the claim that positive and negative affect are orthogonal dimensions of emotional experience (e.g., Watson & Tellegen, 1985; Watson et al., 1999).

Finally, though most positive emotions correlated positively with narcissistic admiration and negatively with narcissistic rivalry, schadenfreude correlated moderately and positively with both the adaptive and maladaptive narcissism facets, a pattern nearly identical to that previously found when examining the link between hubristic pride and narcissism (Tracy & Robins, 2007; Tracy et al., 2009). This result is consistent with prior work showing that schadenfreude arises when one feels malicious envy toward a successful but disliked individual and then enjoys devaluing that individual—and enhancing the self—following that individual’s misfortune (van Dijk et al., 2015). Feelings of malicious envy, devaluation of others, and self-enhancement, are all previously established components of narcissism (e.g., Back et al., 2013; Lange, Crusius, & Hagemeyer, 2016).

4.6 General discussion

The present research represents the first systematic examination of the entire landscape of positive emotions. In Part 1 we identified the distinct, subjective experiential components of each positive emotion that is currently studied in the literature, using an approach in which lay individuals generated thoughts, feelings, and action tendencies that constitute these emotions (see Table 1). We also created short, 3-5 item self-report scales that can be used to measure each

of these states. In Part 2, we assessed the extent to which these emotions are experienced distinctly in (a) broadly defined, pleasant situations, (b) narrowly defined situations that center on one distinct emotion, and (c) at the level of dispositional tendencies. We found that, although considerable overlap emerged among the emotions in broadly defined situations, the majority of positive emotions were experienced distinctly in narrower situations that focused primarily on one positive emotion. Even in such narrower situations, however, the set of emotions linked to caring and loving, including attachment love, empathy, nurturant love, and tenderness, was characterized by considerable overlap. Furthermore, at the level of dispositional tendencies, we found little evidence that positive emotions are experienced distinctly. In Studies 2 and 5, we examined the links between each positive emotion and related affective and personality dispositions, and began to construct a nomological network for each positive emotion.

4.6.1 Implications of Part 1

Examination of the subjective components captured by the items on our newly constructed scales gives insight into the content of these emotions as they are experienced by lay persons (see Table 1). Importantly, although we prioritized lay experience when constructing these scales, the content represented therein is consistent with prior theoretical and empirical treatments. For example, several researchers have argued that awe is accompanied by a sense of vastness (i.e., sensing that something is outside of one's normal experience or greater than the self) and accommodation (i.e., adjusting one's view of the world to account for newly acquired information; e.g., Keltner & Haidt, 2003; Piff et al., 2015; Shiota, Keltner, & Mossman, 2007). Scale items such as "I felt I was in the presence of something quite out of the ordinary" capture vastness, and items such as "I continued to think about what I just saw" capture accommodation.

Similarly, although exact definitions of empathy vary in breadth and inclusiveness, a survey of existing conceptualizations points to the presence of three core features, including experience-sharing (i.e., feeling the emotions of another individual), perspective-taking (i.e., understanding another's mental processes), and empathic concern (i.e., an other-oriented, supportive response that promotes the target's well-being; e.g., Batson et al., 1987; Davis, 1983; Decety & Cowell, 2014; Preston & DeWaal, 2002; Wondra & Ellsworth, 2015; Zaki, 2014). Our empathy scale captures these three components with items such as "I allowed someone to share his or her feelings with me" (i.e., experience-sharing), "I reflected on a time I had experienced a similar situation" (i.e., perspective-taking), and "I tried to help find a solution to someone else's problem" (i.e., empathic concern).

To take another example, researchers have long distinguished between different forms of love, such as romantic (i.e., a strong, passionate and even desperate desire), nurturant (i.e., wanting to provide care and protection), and attachment love (i.e., a sense of connection with a nurturant other; e.g., Berscheid, 2010; Fehr, 2015; Gonzaga et al., 2006; Shiota et al., 2014). All three of these themes are well represented in our scales. Feelings of desire and neediness are captured in the romantic love scale by such items such as "I had a craving for someone" and "The thought of someone was overwhelming". A desire to care and protect are captured in the nurturant love scale by items such as "I gave my full attention to someone" and "I wanted to help someone grow". Finally, a sense of secure connection is captured in the attachment love scale by items such as "I felt a close bond with someone" and "I felt secure".

Importantly, although Part 1 helped us identify the subjective content of most positive emotions studied in the literature, we were unable to identify unique content for several positive emotions. First and most notably, a distinct set of thoughts, feelings, and action tendencies did

not emerge for compassion, independent of the subjective components that were found to constitute closely related emotions; that is, the subjective components that were initially listed as constituting compassion were found, in Studies 1 and 2, to be subjectively experienced as part of empathy, sympathy, or tenderness. Second, we found no unique subjective components of general love; instead, consistent with prior theorizing, experiences of love were characterized by three subtypes—attachment love, nurturant love, and romantic love (Berscheid, 2010; Fehr, 2015; Shota et al., 2014). Third, we found that happiness and contentment involved the same subjective components; we therefore labeled this singular emotion “contentment”, to differentiate it from the vast literature on “happiness” (e.g., Busseri & Sadava, 2011; Diener, 2000; Dunn & Norton, 2013).

4.6.2 Implications of Part 2

Figure 6 visually depicts the interrelations among all positive emotions typically studied in the literature, using network analysis (Borsboom & Cramer, 2013). Each node represents one emotion that was found, in Studies 1 and 2, to be associated with a unique set of thoughts, feelings, and action tendencies, plus authentic and hubristic pride. Each line represents a correlation between any two emotions (nodes), averaged across episodes of both of those emotions, as observed in Study 4. The position of the nodes within the network is based on an algorithm that causes strongly correlated emotions to cluster in the middle of the figure, and more weakly correlated emotions to be located more in the periphery (Fruchterman & Reingold 1991). Line thickness and color was used to indicate the magnitude and direction of correlations, respectively; thick purple lines connecting emotions indicate strong positive correlations, and thinner blue lines indicate weak, negative correlations.

Perhaps the most noteworthy finding emerging from Figure 6 concerns emotions related to caring and loving. Attachment love, nurturant love, and tenderness showed strong positive intercorrelations—as indicated by their relative proximity—and empathy is also located close to this cluster, as a result of correlating strongly with all three. This spatial grouping implies that these four emotions may involve very similar subjective content; indeed, tenderness and attachment love correlated .53 on average, nurturant love and empathy correlated .47 on average, and nurturant love and tenderness correlated .43 on average, and these were among the strongest correlations we observed between emotions. An examination of the content of the items found to best capture these emotions suggests that all four involve feeling a strong bond with another person, considering another person’s well-being, and showing affection toward another person (see Table 1). Notably, based on prior conceptualizations of compassion, if we had found distinctive subjective content for this emotion, it too would likely fall into this region; indeed, a recent authoritative review noted that compassion and other caring emotions involve similar, overlapping definitions (Goetz et al., 2010, p. 352). This definitional overlap suggests that the subjective content of compassion is accounted for in our map of the positive emotion landscape, comprised within attachment love, empathy, nurturant love, and tenderness (as well as sympathy, which was found in Study 2 to be comprised of several subjective components often associated with compassion). One implication of these findings is therefore that previously documented effects of compassion (e.g., Condon & DeSteno, 2011; Oveis et al., 2010; Lim & DeSteno, 2016; Valdesolo & DeSteno, 2011) might best be understood as stemming from a combination of several other positive emotions.

With the exception of this cluster of caring and loving emotions, however, Study 4 suggests that positive emotions are by and large experienced distinctly, at least following narrow

episodes that center on one emotion. In contrast, Study 3 suggests that positive emotions are experienced only marginally distinctly in broad, pleasant situations that do not center on one positive emotion, and Study 5 suggests that positive emotions are not experienced particularly distinctly at the dispositional level. Taken together, these findings imply that researchers wishing to study one specific positive emotion are most likely to capture a relatively pure, distinct version of that emotion in a situation that centers on the emotion in question, whether by virtue of experimental design or a naturally occurring event known to elicit the target emotion. These findings also imply that researchers wishing to study specific positive emotional dispositions may have difficulty isolating the trait they are interested in from other, related dispositions, or from general positive mood. This is consistent with recent evidence that individual differences in the propensity to experience various affectively based well-being constructs (e.g., depression, happiness, meaning) tend to form one overarching well-being factor rather than splitting into distinct variants (Disabato, Goodman, Kashdan, Short, & Jarden, 2016).

4.6.3 Positive emotion nomological networks

Studies 2 and 5 point to several noteworthy findings regarding the cognitive and emotional constructs with which each positive emotion is linked. One somewhat surprising finding from Study 2 is that positive emotions show considerable variation in their links with momentary pleasantness; several are highly pleasant (e.g., contentment, authentic pride, awe), but others are more neutral in valence (e.g., hope, empathy, romantic love), and one is strongly unpleasant (i.e., sympathy). Similar variation was observed in activation, ranging from highly activated (e.g., enthusiasm, romantic love, amusement) to relatively neutral (e.g., sympathy, gratitude). Broadly speaking, these findings suggest that positive emotions can be meaningfully

differentiated using broader affect dimensions as descriptors, and that not all “positive” emotions are experienced as highly pleasant or activated.

Similarly, Study 5 showed that several *positive* emotional dispositions are in fact characterized by a more mixed affective experience. Although all positive emotional dispositions correlated positively with trait positive affect, several showed only weak to moderate links with this disposition, including schadenfreude, sympathy, romantic love, awe, and hubristic pride. These five emotions in turn showed positive associations with dispositional negative affect, suggesting that individuals who tend to feel these emotions frequently feel *both* positive and negative affect. This finding is consistent with prior research; schadenfreude is frequently precipitated by feelings of malicious envy (an unpleasant emotion that involves feelings of inferiority and dislike toward another individual; van Dijk et al., 2015), and hubristic pride is partly characterized by low or fragile self-esteem and shame-proneness (Tracy et al., 2011). Sympathy, too, has been linked to aversive feelings of personal distress (Batson et al., 1987; Eisenberg et al., 1994), and romantic love has long been conceptualized as involving longing and separation anxiety (Berscheid, 2010; Rubin, 1970). Relatedly, although awe is typically considered a pleasant emotion (e.g., Keltner & Haidt, 2003; Piff et al., 2015; Shiota et al., 2007), recent work suggests it may be accompanied by feelings of fear (Gordon, Stellar, Anderson, McNeil, Loew, & Keltner, 2016).

Importantly, of the five emotions that showed mixed-affective profiles in Study 5, four (i.e., hubristic pride, romantic love, schadenfreude, and sympathy) did not correlate strongly with momentary pleasantness in Study 2 (the exception was awe, which correlated strongly and positively with momentary pleasantness). Taken together, these findings suggest that hubristic pride, romantic love, and schadenfreude are typically experienced as not very pleasant, despite

being considered “positive emotions”. Taking this point further, the strong negative link between sympathy and momentary pleasantness suggests that sympathy may be better thought of as a negative emotion, consistent with some prior work (e.g., Fredrickson et al., 2003).

Turning to positive emotions that were experienced as highly pleasant and activated, two results are particularly worth highlighting as they might point to some redundancy in emotional constructs. First, contentment correlated very strongly with momentary pleasant affect in Study 2, even when the items “happy” and “content” were removed from the contentment scale (mean $r = .62$; $r = .83$ when correcting for attenuation). This finding, along with the fact that the best existing measure of pleasant mood includes the items “happy” and “content” (Barrett & Russell, 1998), casts doubt on whether contentment and pleasant affect can be meaningfully differentiated at the subjective level. Second, enthusiasm correlated very strongly with momentary activation in Study 2 ($r = .65$; $r = 1.00$ when correcting for attenuation), likewise suggesting that enthusiasm and activated affect may not be meaningfully distinguishable at the subjective level.

A final noteworthy finding from Studies 2 and 5 was that certain positive emotions may have somewhat unique associations with certain related dispositions. For example, whereas momentary empathy correlated more strongly with dispositional perspective taking than did momentary sympathy or tenderness, momentary sympathy correlated more strongly with dispositional personal distress than did momentary empathy or tenderness, suggesting that a tendency to take others’ perspectives may be uniquely associated with empathy, whereas a proclivity toward personal distress may be uniquely associated with sympathy. As another example, anxious attachment style correlated more strongly with momentary romantic love than with momentary nurturant or attachment love, whereas avoidant attachment style correlated most

strongly (and negatively) with attachment love, compared to romantic or nurturant love. This pattern suggests that romantic and attachment love may be the primary emotional markers of anxious and secure attachment, respectively.

4.6.4 Implications for future research

4.6.4.1 Use short scales

The present research yielded short, 3-5 item self-report scales comprised of brief statements capturing thoughts, feelings, and action tendencies, and this may represent an optimal way to assess distinct positive emotions. Assessing emotions with brief statements capturing subjective components (e.g., “I felt a desire to become more like a specific person”) is preferable to single words (e.g., “I felt admiration”) because short phrases are more easily interpretable and unambiguous than single items, which often elicit considerable variability in their interpretation by lay persons (e.g., Heider, 1991; Russell, 1991a; Shaver et al., 1987). A researcher who uses a scale comprised of short phrases is therefore more likely to know exactly what he or she is measuring, compared to one who uses a scale comprised of single words.

An additional reason to prefer phrases is that they allow researchers to capture a wider range of subjective experiential content; the number of thoughts, feelings, and action tendencies that can be measured with short phrases is seemingly limitless, facilitating the assessment of the full range of subjective experiential content that constitutes an emotion. In contrast, the number of single emotion words is more limited; as a result, the same single emotion words are often used to assess more than one emotion across studies (i.e., words such as afraid, anxious, jittery, nervous, and scared are used to measure both fear and anxiety, across studies; Weidman et al., 2016). Assessing different emotions with the same word can create the spurious impression that two different emotions have the same suite of causes, correlates, and consequences, when in fact

this similarity is due to the same measure being used to capture both constructs (i.e., the Jingle Fallacy; Thorndike, 1911).

Of course, the issue of item-level overlap between measures of distinct emotions would be obviated if each emotion were measured using only the word that refers to the given emotion (i.e., measuring *admiration* with the item “I feel admiration”). Single-item measures of this form are problematic, however, because they tend to demonstrate low reliability. The results of Studies 2 and 3 also suggest that single-item measures do not adequately capture most positive emotions. Table 6 displays the correlation between single-item emotion words (e.g., “I felt admiration”) and both the full-length and short versions of our newly constructed scales for measuring that same emotion. Following broad, pleasant situations recalled in Study 3, these correlations tended to be large enough to suggest that the single item adequately captured the distinct emotion of interest (full-length: $M = .76$, $SD = .05$; short: $M = .65$, $SD = .07$). However, six (50%) of the correlations between single-items and short scales fell below .60, indicating some discrepancy between the two measures. Additionally, for four emotions, the single item meant to capture that emotion correlated more strongly with a different short scale than it did with the target short scale (e.g., “I felt admiration” correlated more strongly with the gratitude and tenderness short scales than it did with the admiration short scale).

Single-items did an even poorer job of capturing the target emotion in Study 2, following narrow episodes centered on one distinct emotion. Correlations between single items and full-length scales tended to be strong ($M = .48$, $SD = .15$), but the majority (12; 75%) fell below .60, indicating some discrepancy. Additionally, when full-length scales were computed without the single-items—thereby eliminating empirical overlap that will necessarily inflate the correlations—they correlated even lower with the single-items ($M = .44$; $SD = .12$). The

correlations between single items and short scales were lower still, only reaching moderate magnitude on average ($M = .34$, $SD = .11$). Furthermore, for certain emotions whose labels lack clear meaning—schadenfreude, romantic love, nurturant love, and attachment love—single-items loaded weakly on the corresponding factor for the given emotion (i.e., below .40), and were weakly correlated with the corresponding long ($r_s = .09$ -.45) and short ($r_s = .06$ -.37) scales.

It is important to highlight the shortcomings of single-item emotion scales explicitly because these scales have several properties that make them appealing measurement options, most notably that they are extremely time-efficient. However, in addition to the reliability and validity concerns noted above, the use of single items may spuriously exaggerate the apparent distinctiveness of various positive emotions, largely because single emotion words typically have extremely low reliability. Supporting this point, in Study 3 the average intercorrelation among the 12 single items included as part of their respective full-length positive emotion scales (i.e., the correlations between the items “I felt admiration”, “I felt awe”, “I felt gratitude”, etc.) was .33, whereas the corresponding average intercorrelations among the full-length and short positive emotion scales themselves were .49 and .37, respectively.

4.6.4.2 Consider overlap among positive emotions

The observed overlap among positive emotions in the present studies, particularly following broad, pleasant emotional situations and concerning emotions at the trait level, suggests that researchers interested in isolating a cause, correlate, or consequence of one positive emotion must take care to rule out the possibility that the effect is equally accounted for by another, related positive emotion. This is especially true for researchers wishing to study positive emotions that were shown to be highly intercorrelated on average (e.g., attachment love, empathy, nurturant love, tenderness). To address this potential concern, researchers may wish to

identify positive emotions that are conceptually similar and empirically related to their emotion of interest for use as a control variable (e.g., tenderness or nurturant love as a control for empathy), and then test whether a given empirical effect is in fact unique to one emotion. These tests might include using the conceptually similar emotion as a covariate when examining the effect of the focal emotion, or re-running the primary analyses with the similar emotion substituted for the focal emotion. Importantly, selecting only one unrelated positive emotion to employ as a control, or controlling for general pleasant affect, still leaves open questions about the distinctiveness of the particular effect, because positive emotions differ in content beyond pleasantness (e.g., affiliative action tendencies).

Of course, these recommendations set a high bar for affective scientists who wish to examine the effect of one particular distinct emotion. Readers of the previous paragraph might object, “I just want to show that pride predicts something, and I don’t really care whether gratitude predicts the same thing”. Yet isolating the effects of any distinct positive emotion, or discovering that multiple positive emotions have similar effects, is crucial to building a cumulative science of positive emotion, and represents the best path toward fully understanding the boundaries *and* areas of overlap among positive emotions that are considered distinct. Without such rigorous control analyses, it will be impossible to determine exactly which positive emotions exert similar or distinct effects, and therefore to compare and contrast positive emotion research findings across years and laboratories.

4.6.5 Conclusion

The science of distinct positive emotions has been experiencing a surge in momentum for the better part of a decade. Interest in the causes, correlates, and consequences of positive emotions has never been greater, and this has led to a flood of high-impact publications on a

range of positive emotional states and traits. Yet, as several scholars have noted, to date there have been no attempts to construct a comprehensive taxonomy of the full range of distinct positive emotions experienced in everyday life (Shiota et al., 2016). This has led to some confusion in the manner in which researchers conceptualize and measure distinct emotions across studies, hindering cumulative progress in the field. The present research addresses this issue by identifying the subjective content of each positive emotion currently studied in the literature and assessing the extent to which these emotions are experienced distinctly. These findings thereby lay a foundation for uncovering the unique antecedents and functional consequences of each distinct positive emotion—while distinguishing these from the properties shared among emotions—and provide researchers with a set of tools to assess these states in future empirical endeavors. We hope that the present research helps advance the cumulative scientific study of distinct positive emotions.

Table 10: Full and short-length distinct positive emotion scales

Admiration	Awe	Gratitude
I felt admiration	I felt awe	I felt gratitude
*I felt a desire to become more like a specific person	*I continued to think about what I just saw	*I felt appreciative toward a specific person
*I felt as if I could learn a lot from a specific person	*I could not believe what I had just seen	I felt cared for
*I felt motivated to work harder	*I felt I was in the presence of something quite out of the ordinary	I felt fortunate
I had a great deal of respect toward a specific person	I felt wonder	*I felt like I had benefited from a specific person's action
I strongly valued a specific person's opinion	*I was rendered speechless	I felt lucky to know a specific person
	What I just saw was simply amazing	* I thought that a specific person who helped me should be acknowledged
		I wanted to express thanks
Sympathy	Tenderness	Empathy
I felt sympathy	I felt tenderness	I felt empathy
*I felt bad for someone	*I felt a strong connection with someone	I affirmed what someone else was feeling
*I felt pity for someone	*I felt great care toward someone	I allowed someone to share his or her feelings with me
I felt sorry for someone	*I felt warmth for someone	I listened carefully to what someone had to say
I thought that someone else's situation seemed unfair	I had a desire to be close to someone	*I reflected on a time I had experienced a similar situation
*I worried that someone would not be okay	I showed affection toward someone	*I tried to help find a solution to someone else's problem
Someone else seemed vulnerable to me	I showed fondness toward someone	*I tried to relate to someone else's experience
	*I wanted to hold someone's hand	

Interest	Hope	Enthusiasm
I felt interest	I felt hope	I felt enthusiasm
*I felt engaged with what I was doing	*I drew on my inner strength	*I felt adventurous
I paid close attention to what I saw and heard	*I engaged in some wishful thinking	*I wanted to get others excited
I wanted to seek out more information	*I felt challenged	I was eager
I was curious about what I was seeing	I had a great desire for a certain outcome	*I was on top of the world
I was focused	I thought about the future	
*My attention was absorbed	*I tried to believe in myself	
*My mind was very active	*I tried to stay positive	
Schadenfreude	Amusement	Contentment
I felt that justice had been served for someone else	I felt amusement	I felt happy
I thought someone deserved what had happened to them	I giggled	I felt content
*I thought that someone had brought something bad upon themselves	*I laughed	*I enjoyed the situation
*I thought that someone had it coming	*I was entertained	*I felt that all was right in the world
*I wanted to point out someone else's shortcomings	*Something seemed funny	*I wanted to stay in the moment
Nurturant Love	Romantic Love	Attachment Love
I felt dedication toward someone	I could not stop thinking about someone	*I felt a close bond with someone
*I gave my full attention to someone	*I felt butterflies in my stomach	*I felt accepted by someone
I showed support for someone	*I felt giddy	I felt like I could rely on someone
*I tried to show patience with someone	*I felt vulnerable	I felt like someone adored me
*I wanted to help someone grow	*I had a craving for someone	*I felt secure
*I wanted to sacrifice my own needs for someone	I longed for someone	I felt that someone else was there for me
*I wanted what was best for someone	*I was afraid of rejection	I trusted someone else
	The thought of someone was overwhelming	

Note: Items with * constitute the short versions of each scale, which were used in Studies 3, 4, and 5.

Table 11: Descriptive statistics and intercorrelations for state positive emotion scales during a pleasant emotional experience (Study 3)

	Admiration	Awe	Gratitude	Empathy	Sympathy	Tenderness	Contentment	Amusement
Admiration	--	0.49	0.57	0.63	0.45	0.40	0.16	0.19
Awe	0.56	--	0.42	0.39	0.38	0.33	0.23	0.13
Gratitude	0.75	0.51	--	0.45	0.19	0.54	0.34	0.23
Empathy	0.79	0.49	0.67	--	0.51	0.32	0.13	0.26
Sympathy	0.45	0.35	0.19	0.50	--	0.10	-0.24	-0.05
Tenderness	0.62	0.46	0.73	0.63	0.19	--	0.54	0.25
Contentment	0.32	0.35	0.55	0.34	-0.22	0.57	--	0.48
Amusement	0.29	0.26	0.36	0.37	0.00	0.36	0.53	--
Schadenfreude	0.47	0.50	0.24	0.49	0.66	0.21	-0.06	0.02
Hope	0.75	0.67	0.63	0.70	0.47	0.60	0.36	0.32
Enthusiasm	0.56	0.61	0.60	0.56	0.19	0.54	0.61	0.57
Interest	0.59	0.59	0.62	0.62	0.16	0.60	0.63	0.51
Romantic Love	0.60	0.62	0.50	0.50	0.53	0.56	0.20	0.25
Attachment Love	0.67	0.39	0.84	0.63	0.11	0.78	0.63	0.45
Nurturant Love	0.73	0.50	0.64	0.79	0.46	0.73	0.36	0.26
Alpha (short)	.72	.74	.71	.84	.77	.73	.68	.70
Mean (short)	2.84	2.62	3.39	2.68	1.73	3.60	4.01	3.60
SD (short)	1.09	1.02	1.07	1.15	0.98	1.00	0.87	1.00
Alpha (full)	.81	.87	.88	.81	.90	.90	.83	.82
Mean (full)	3.18	2.78	3.66	3.12	1.86	3.59	4.12	3.57
SD (full)	0.95	1.02	0.93	0.91	0.94	1.01	0.80	0.99

	Schadenfreude	Hope	Enthusiasm	Interest	Romantic Love	Attachment Love	Nurturant Love
Admiration	0.51	0.68	0.48	0.22	0.50	0.27	0.62
Awe	0.50	0.60	0.51	0.25	0.53	0.15	0.43
Gratitude	0.27	0.51	0.44	0.43	0.39	0.49	0.53
Empathy	0.50	0.56	0.42	0.25	0.32	0.26	0.64
Sympathy	0.67	0.40	0.16	-0.10	0.47	-0.08	0.40
Tenderness	0.14	0.42	0.42	0.53	0.41	0.70	0.63
Contentment	-0.10	0.30	0.53	0.68	0.19	0.68	0.34
Amusement	0.05	0.30	0.51	0.42	0.18	0.36	0.24
Schadenfreude	--	0.43	0.26	-0.07	0.52	-0.06	0.39
Hope	0.48	--	0.62	0.32	0.56	0.33	0.59
Enthusiasm	0.30	0.69	--	0.44	0.48	0.40	0.47
Interest	0.23	0.63	0.70	--	0.13	0.61	0.41
Romantic Love	0.57	0.67	0.54	0.42	--	0.21	0.38
Attachment Love	0.17	0.58	0.58	0.60	0.45	--	0.41
Nurturant Love	0.45	0.71	0.56	0.60	0.53	0.61	--
Alpha (short)	.76	.75	.70	.70	.72	.76	.75
Mean (short)	1.68	3.05	3.20	4.02	2.32	3.97	3.12
SD (short)	0.96	0.96	1.06	0.84	0.91	0.89	0.97
Alpha (full)	.83	.83	.79	.82	.84	.86	.84
Mean (full)	1.83	3.19	3.41	3.69	2.38	3.72	3.23
SD (full)	0.96	0.91	0.95	0.78	0.93	0.90	0.96

Note: $N = 303$; Full = full-length scale; Short = short scale

Correlations greater than $|\cdot 11|$ are significant ($p < .05$)

Correlations below the diagonal are for full versions of each scale; correlations above the diagonal are for short versions.

Alpha = internal consistency; SD = standard deviation

Table 12: Intercorrelations between short and long versions of each positive emotion scale (Studies 2 and 3)

	Study 2	Study 3
Admiration	.91	.89
Awe	.93	.94
Gratitude	.89	.90
Empathy	.84	.87
Sympathy	.91	.93
Tenderness	.95	.95
Contentment	.93 ^a	.96
Amusement	.95	.95
Schadenfreude	.97	.93
Hope	.92	.94
Enthusiasm	.94	.94
Interest	.86	.85
Romantic Love	.96	.93
Attachment Love	.91	.88
Nurturant Love	.98	.97
Mean	.92	.92
SD	.03	.04

Note: Study 2 $N_s = 205-208$; Study 3 $N = 303$.

^a This value is the average of .90 (the correlation between the short and long versions of the contentment scale when participants wrote about happiness) and .96 (the correlation when participants wrote about contentment).

SD = Standard deviation

All correlations are significant at $p < .001$

Correlations are not presented for Study 4 because long scale versions were not included in that study.

Table 13: Descriptive statistics and intercorrelations for trait positive emotion scales (Study 5)

	Admiration	Awe	Gratitude	Empathy	Sympathy	Tenderness	Contentment	Amusement
Admiration	--	0.55	0.62	0.62	0.41	0.58	0.53	0.47
Awe	0.65	--	0.34	0.48	0.51	0.37	0.40	0.34
Gratitude	0.83	0.54	--	0.67	0.39	0.77	0.50	0.50
Empathy	0.79	0.58	0.81	--	0.50	0.62	0.53	0.50
Sympathy	0.53	0.56	0.48	0.61	--	0.43	0.21	0.16
Tenderness	0.78	0.53	0.85	0.79	0.51	--	0.48	0.50
Contentment	0.64	0.55	0.69	0.60	0.24	0.57	--	0.64
Amusement	0.57	0.56	0.58	0.59	0.27	0.58	0.71	--
Schadenfreude	0.37	0.51	0.23	0.27	0.52	0.23	0.23	0.27
Hope	0.70	0.55	0.71	0.73	0.43	0.65	0.65	0.58
Enthusiasm	0.68	0.72	0.65	0.64	0.36	0.59	0.76	0.68
Interest	0.71	0.55	0.67	0.72	0.40	0.59	0.68	0.60
Romantic Love	0.43	0.60	0.31	0.37	0.51	0.45	0.16	0.34
Attachment Love	0.76	0.47	0.87	0.73	0.40	0.82	0.69	0.59
Nurturant Love	0.77	0.50	0.83	0.85	0.61	0.87	0.54	0.50
Alpha (short)	.54	.68	.81	.77	.66	.84	.68	.76
Mean (short)	3.35	2.62	3.72	3.56	2.90	3.74	3.25	3.58
SD (short)	0.81	0.80	0.92	0.84	0.92	0.93	0.85	0.81
Alpha (full)	.80	.82	.91	.88	.83	.91	.84	.84
Mean (full)	3.52	2.81	3.71	3.67	3.04	3.72	3.38	3.44
SD (full)	0.77	0.79	0.85	0.77	0.81	0.87	0.84	0.83

	Schadenfreude	Hope	Enthusiasm	Interest	Romantic Love	Attachment Love	Nurturant Love
Admiration	0.31	0.62	0.55	0.53	0.33	0.57	0.60
Awe	0.50	0.39	0.54	0.29	0.57	0.26	0.38
Gratitude	0.11	0.58	0.49	0.52	0.26	0.74	0.75
Empathy	0.28	0.63	0.59	0.57	0.35	0.58	0.72
Sympathy	0.43	0.34	0.26	0.26	0.45	0.25	0.53
Tenderness	0.08	0.59	0.51	0.49	0.33	0.74	0.80
Contentment	0.16	0.61	0.71	0.56	0.16	0.62	0.50
Amusement	0.18	0.58	0.61	0.52	0.25	0.58	0.45
Schadenfreude	--	0.16	0.29	0.08	0.41	0.03	0.18
Hope	0.28	--	0.60	0.68	0.18	0.64	0.63
Enthusiasm	0.40	0.69	--	0.49	0.33	0.53	0.53
Interest	0.22	0.80	0.65	--	0.09	0.58	0.59
Romantic Love	0.48	0.29	0.38	0.22	--	0.08	0.27
Attachment Love	0.19	0.65	0.63	0.62	0.23	--	0.69
Nurturant Love	0.26	0.67	0.59	0.65	0.37	0.78	--
Alpha (short)	.74	.78	.78	.73	.60	.78	.84
Mean (short)	2.49	3.72	2.95	3.81	2.65	3.70	3.72
SD (short)	0.97	0.73	1.00	0.76	0.77	0.94	0.81
Alpha (full)	.78	.84	.86	.87	.76	.91	.89
Mean (full)	2.66	3.78	3.12	3.83	2.75	3.68	3.76
SD (full)	0.87	0.69	0.93	0.71	0.77	0.94	0.81

Note: $N = 349$

Full = full-length scale

Short = short scale

Correlations greater than .10 are significant ($p < .05$)

Correlations below the diagonal are for full versions of each scale; correlations above the diagonal are for short versions.

Alpha = internal consistency; SD = standard deviation

Table 14: Correlations among short trait positive emotion scales and related personality constructs (Study 5)

	Admiration	Awe	Gratitude	Empathy	Sympathy	Tenderness	Contentment	Amusement
Positive Affect	0.59	0.37	0.52	0.53	0.19	0.49	0.64	0.57
Negative Affect	0.00	0.28	-0.13	-0.04	0.25	-0.08	-0.23	-0.14
Extraversion	0.34	0.21	0.30	0.29	0.05	0.29	0.47	0.38
Neuroticism	-0.19	0.02	-0.22	-0.19	0.11	-0.21	-0.48	-0.32
Agreeableness	0.34	0.02	0.42	0.40	0.11	0.43	0.42	0.37
Conscientiousness	0.29	-0.01	0.30	0.23	-0.01	0.26	0.39	0.34
Openness to Experience	0.30	0.13	0.30	0.31	0.06	0.24	0.28	0.29
Self-Esteem	0.23	-0.02	0.32	0.27	-0.11	0.31	0.53	0.47
Narcissistic Admiration	0.37	0.38	0.22	0.28	0.09	0.23	0.43	0.36
Narcissistic Rivalry	-0.03	0.26	-0.22	-0.13	0.10	-0.21	-0.10	-0.05

	Schadenfreude	Hope	Enthusiasm	Interest	Romantic Love	Attachment Love	Nurturant Love
Positive Affect	0.19	0.66	0.67	0.65	0.11	0.61	0.54
Negative Affect	0.31	-0.19	-0.10	-0.24	0.47	-0.31	-0.06
Extraversion	0.11	0.39	0.57	0.30	-0.08	0.40	0.29
Neuroticism	0.17	-0.37	-0.38	-0.35	0.38	-0.43	-0.24
Agreeableness	-0.23	0.42	0.34	0.47	-0.14	0.49	0.48
Conscientiousness	-0.11	0.45	0.27	0.51	-0.22	0.44	0.29
Openness to Experience	-0.03	0.40	0.32	0.36	0.00	0.22	0.30
Self-Esteem	-0.16	0.53	0.39	0.45	-0.33	0.56	0.29
Narcissistic Admiration	0.34	0.36	0.57	0.24	0.17	0.32	0.22
Narcissistic Rivalry	0.47	-0.17	0.01	-0.24	0.29	-0.21	-0.21

Note: $N = 349$

Correlations greater than .10 are significant ($p < .05$)

Positive and Negative Affect = Positive and Negative Affect Schedule (PANAS; Watson et al., 1988)

Self-Esteem = Rosenberg Self-Esteem Scale (Rosenberg, 1965)

Extraversion, Neuroticism, Agreeableness, Conscientiousness, Openness to Experience = Big Five Inventory (BFI; John et al., 2008)

Narcissistic Admiration and Rivalry = Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back et al., 2013)

Table 15: Intercorrelations between single-item emotion terms and scales for respective positive emotions (Studies 2 and 3)

	Correlation between short scale and single item (Study 2)	Correlation between long scale and single item (Study 2)	Correlation between short scale and single item (Study 3)	Correlation between long scale and single item (Study 3)
Admiration	.38	.51 (.38)	.50#	.74 (.60)
Awe	.47	.62 (.53)	.63	.78 (.69)
Gratitude	.31	.55 (.46)	.59	.78 (.69)
Empathy	.25	.38 (.26)	.48#	.68 (.54#)
Sympathy	.38	.55 (.44)	.51	.70 (.57)
Tenderness	.35	.47 (.38)	.71	.82 (.75)
Contentment (with “I felt happy”)	.36	.60 (.58)	.69	.82 (.69)
Contentment (with “I felt content”)	.52	.70 (.68)	.66	.80 (.66)
Amusement	.36	.52 (.36)	.72	.83 (.72)
Schadenfreude	.32	.31 (--)	--	--
Hope	.22	.47 (.32)	.54#	.69 (.59)
Enthusiasm	.46	.61 (.48)	.52#	.72 (.57)
Interest	.33	.54 (.40)	.71	.73 (.63)
Romantic Love	.37	.45 (--)	--	--
Nurturant Love	.06	.09 (--)	--	--
Attachment Love	.36	.35 (--)	--	--
Mean	.37	.54 (.44)	.65	.76 (.64)
SD	.09	.08 (.12)	.07	.05 (.07)

Note: Study 2 $N_s = 205-208$; Correlations greater than .13 are significant ($p < .05$)

Study 3 $N = 303$; Correlations greater than .11 are significant ($p < .05$)

#: Single item correlated more strongly with a different scale than it did with the target scale

Correlations between single items and long scales are inflated, given that each single item is included in the long scale meant to measure that emotion. Correlations excluding the single item from the long scales are therefore presented in parentheses.

Correlations between single items and long scales excluding the single item were not available for schadenfreude, romantic love, nurturant love, and attachment love, because these single items were not included in their respective scales. For the same reason, correlations between the single items and scales for these four emotions are not available in Study 3.

Figure 6: Flowchart displaying the process used to uncover the distinct subjective content of each positive emotion in Part 1

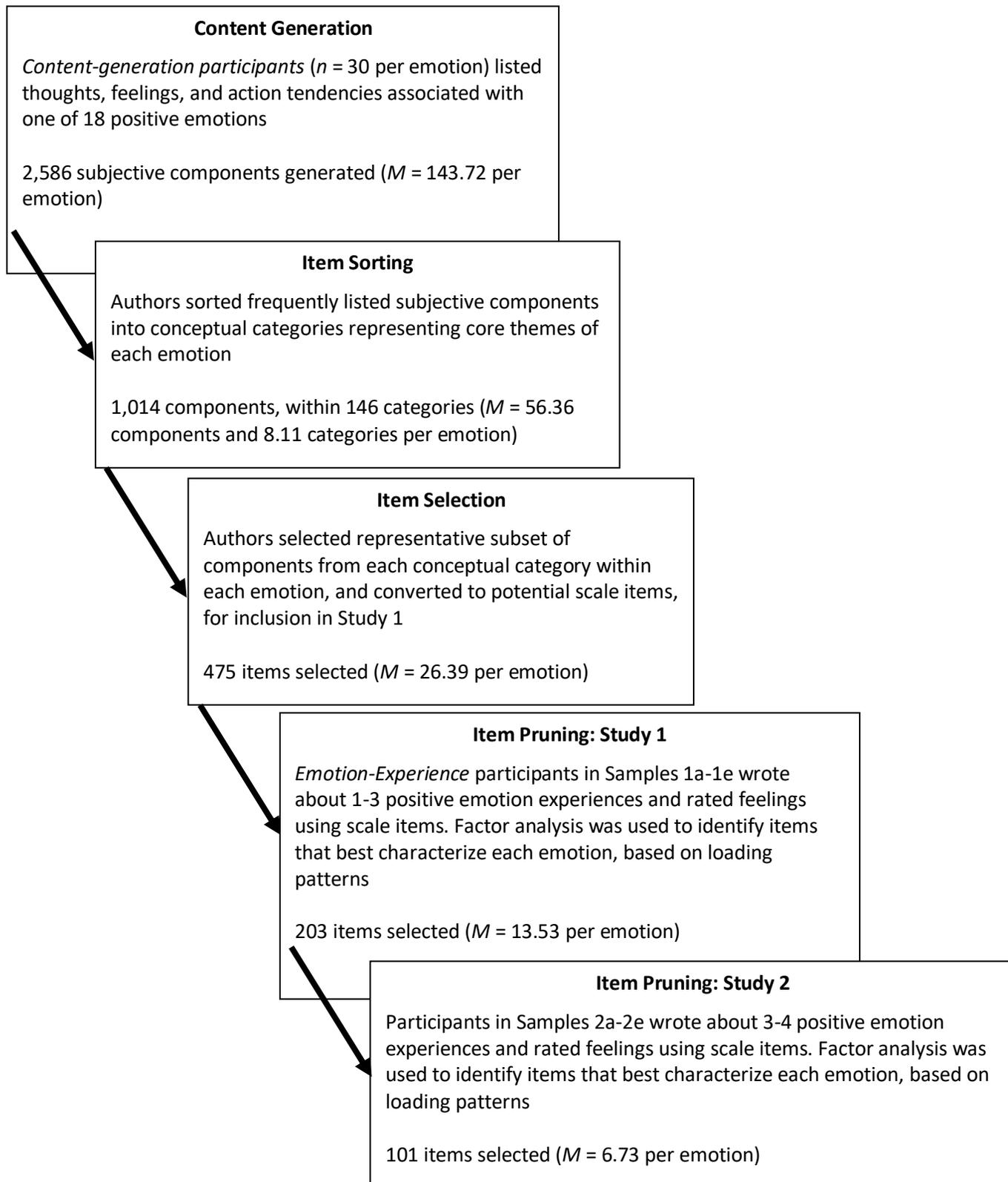
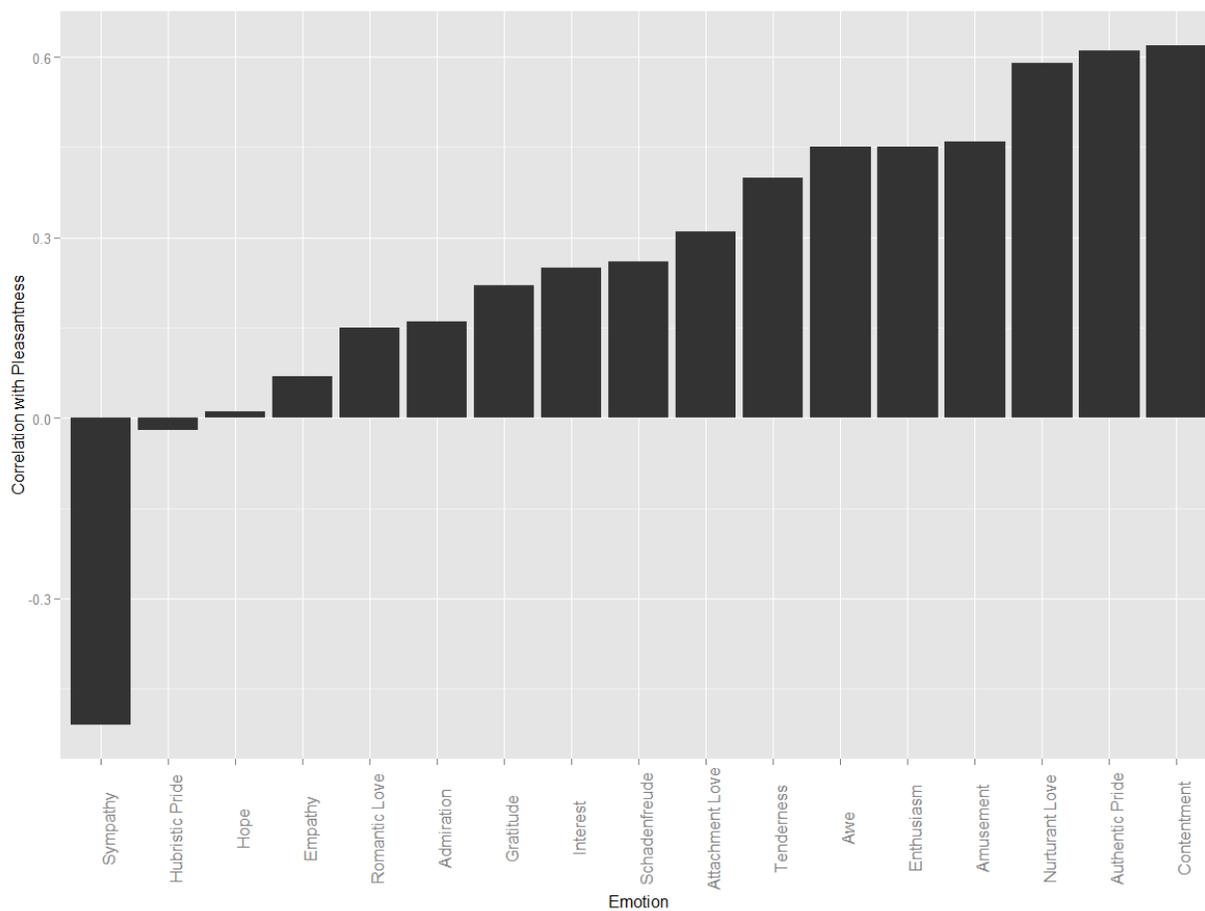
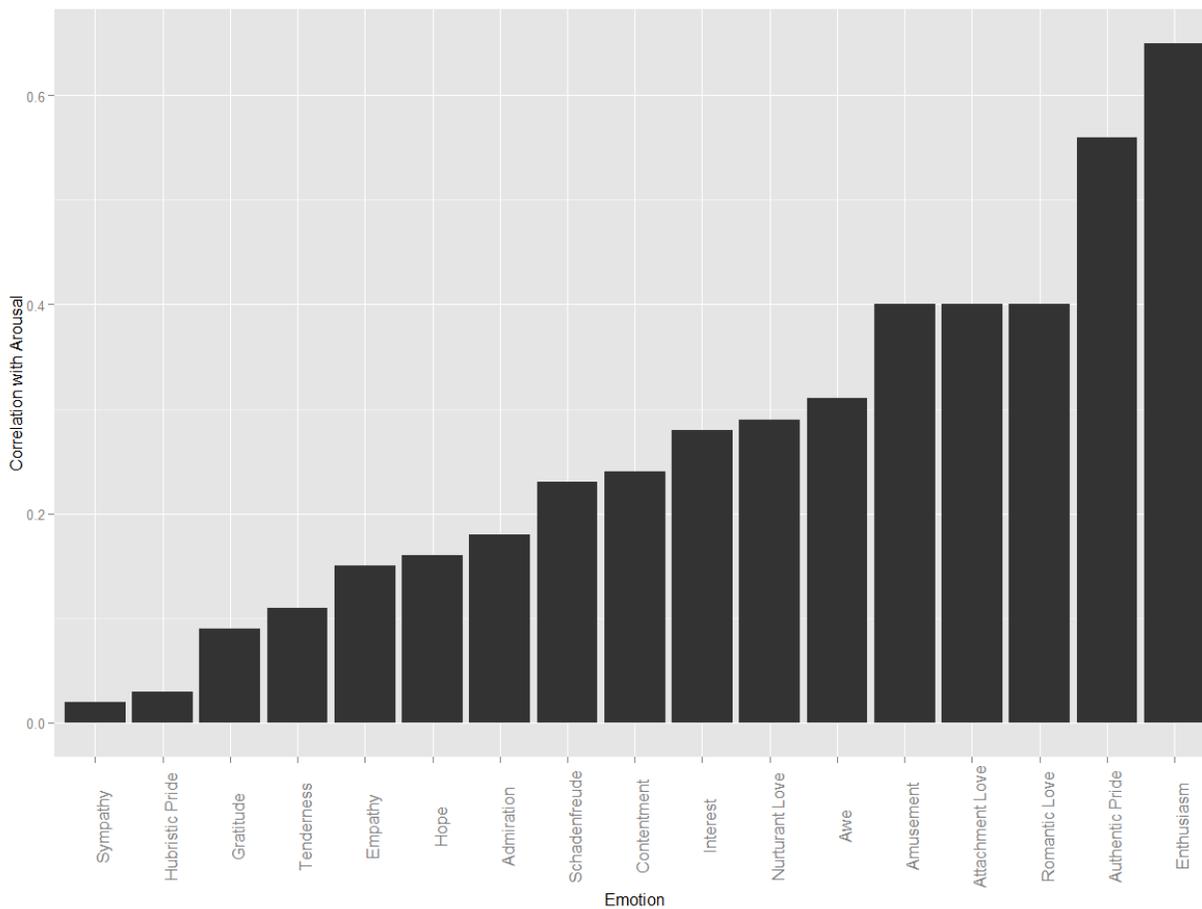


Figure 7: Pleasantness of each positive emotion (Study 2)



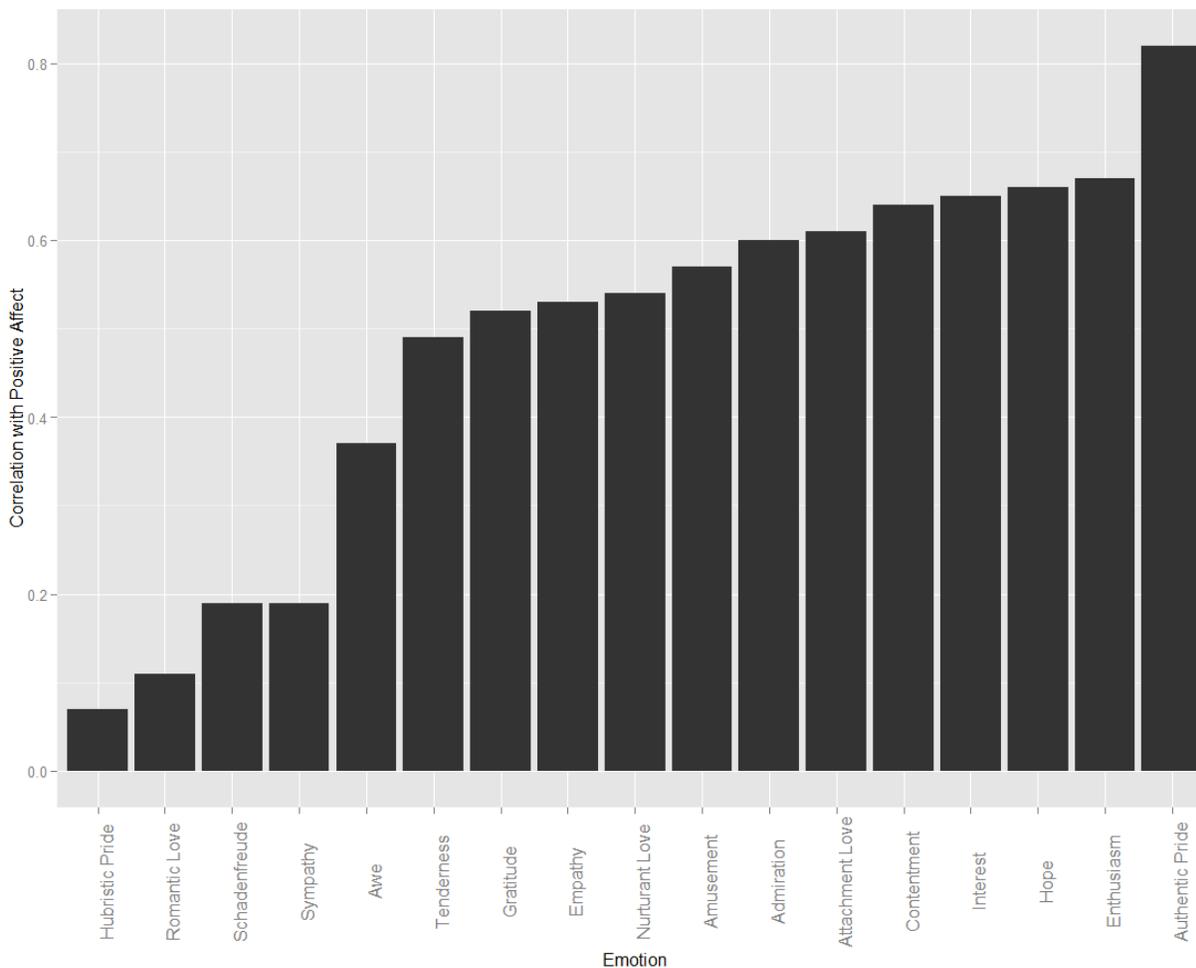
Note: Bars represent the magnitude of correlations between state emotions and state pleasantness (Barrett & Russell, 1998), when recalling narratives of that same emotion.

Figure 8: Activation level of each positive emotion (Study 2)



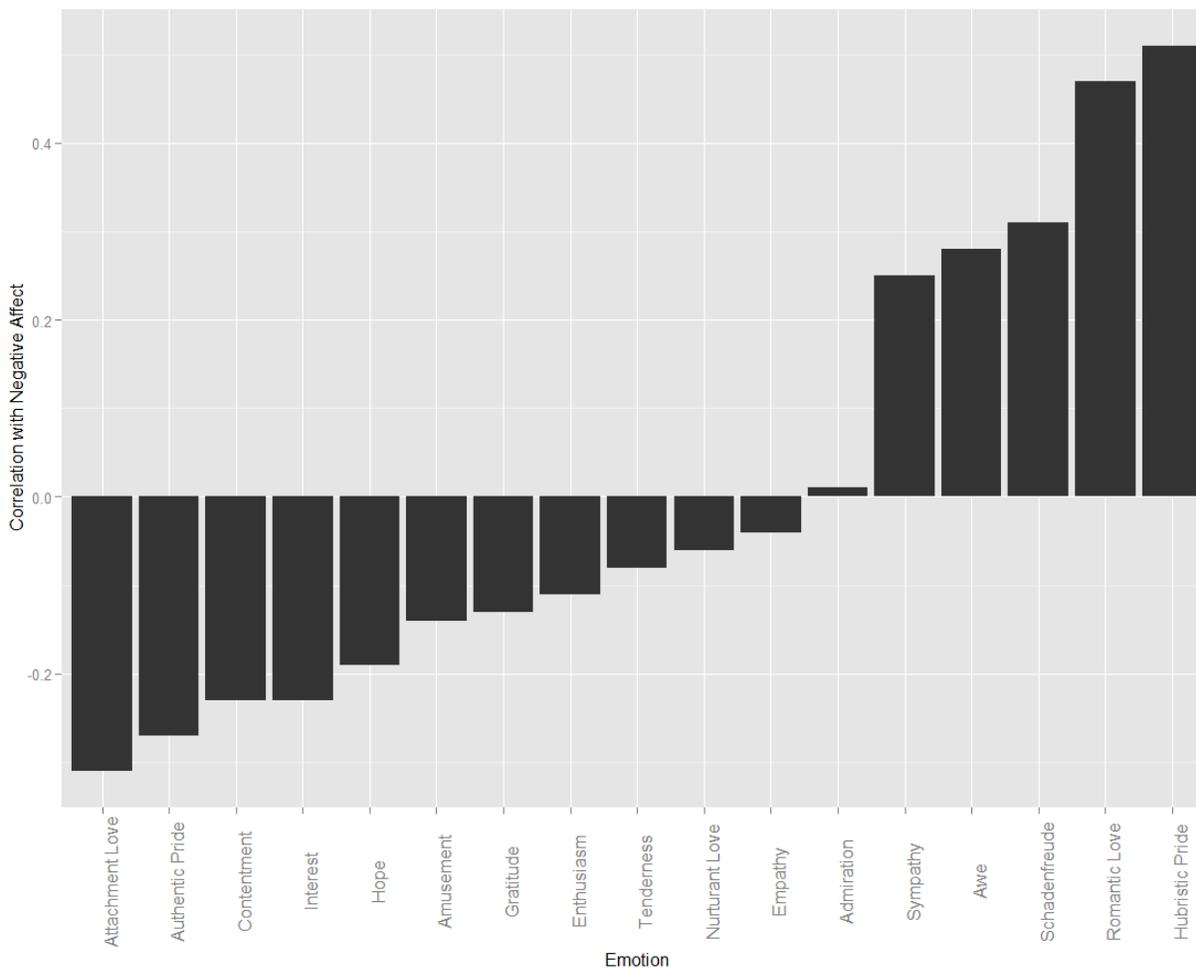
Note: Bars represent the magnitude of correlations between state emotions and state activation (Barrett & Russell, 1998), when recalling narratives of that same emotion.

Figure 9: Correlations between dispositional positive emotions and trait positive affect (Study 5)



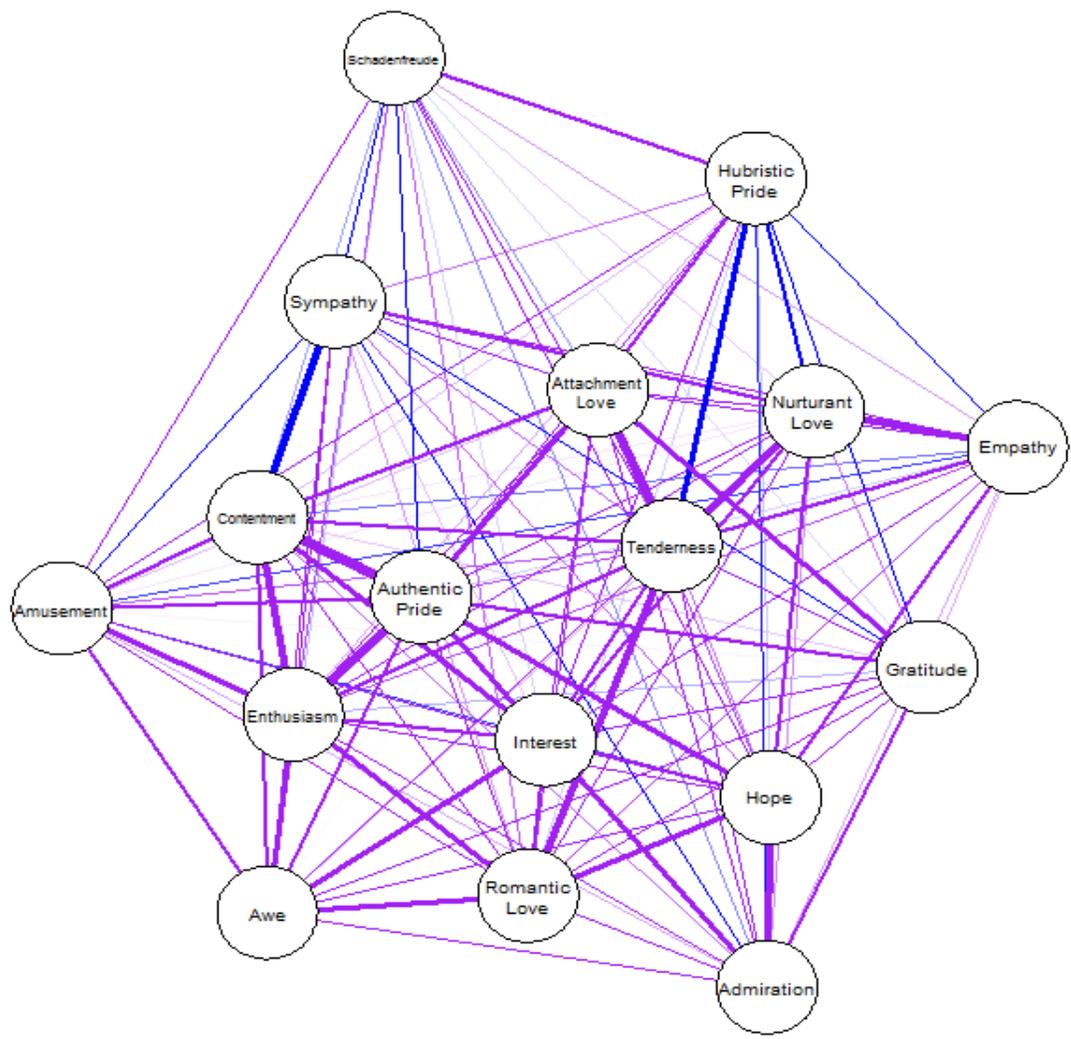
Note: Bars represent the magnitude of correlations between trait emotions and trait positive affect (Watson et al., 1988).

Figure 10: Correlations between dispositional positive emotions and trait negative affect (Study 5)



Note: Bars represent the magnitude of correlations between trait emotions and trait negative affect (Watson et al., 1988).

Figure 11: Network depiction of the interrelations among all positive emotions



Note: Each node represents one positive emotion that was found to be experienced distinctly in Studies 1 and 2. Each line represents a correlation between two positive emotions, averaged across episodes of both of those emotions, based on the results of Study 4. Purple lines indicate positive correlations and blue lines indicate negative correlations; line thickness indicates the magnitude of correlations (thicker lines indicate larger correlations). The position of the nodes within the network is based on an algorithm which causes strongly correlated emotions to cluster in the middle and emotions with weaker correlations to be located more peripherally (Fruchterman & Reingold 1991; see also Borsboom & Cramer, 2013).

Chapter 5: Reflecting on iterations, and where distinct positive emotion research goes from here

Chapter 1 of this dissertation outlined an overarching two-stage process by which measurement decisions and theory development are inextricably linked. Stage 1 of this process involves initial definition and measurement of a construct, and emphasizes content validity (Bryant, 2000); at this stage researchers plant a stake in the ground and offer an initial attempt to codify exactly what exactly a construct is (Smith, 2005). Stage 2 of this process involves examining the power of the newly minted construct in explaining human behavior, and emphasizes convergent, discriminant, and predictive validity (Bryant, 2000); at this stage, the field at large vets the construct, and begins to paint the nomological network in which the construct is situated (Cronbach & Meehl, 1955; Campbell & Fiske, 1959). Completion of Stage 2 is then typically followed by iteration back to Stage 1, whereby researchers revise existing definitions of the construct, and develop novel ways to measure the construct based on this re-definition, before again proceeding on to Stage 2 in which this new definition and operationalization of the construct is vetted.

5.1 Lessons learned

Thinking about this two-stage cycle linking measurement and theory, and using it as a lens through which to view a range of diverse research literatures, can drastically shape the way we view the processes of construct validation and scale construction. Below I will outline several insights that the two-stage process provides.

5.1.1 Insight 1: Iteration is good science

The two-stage process by which measurement and theory are linked is inherently iterative and ongoing, in line with the general notion that science is perpetually progressing through a series of incremental, self-correcting insights. It follows that, for any given construct or subset of the literature, taking additional trips through this two-stage cycle is a healthy and generative ordeal. Chapter 1 of this dissertation presented several examples to this end. In the cases of valuing happiness, shame and guilt, narcissism, and depression, we see literatures in which initial definitions and measurement tools have in the last decade been revised to account for discrepancies between the initial formulation of each construct, the empirical findings generated by the original measurement tools, and the field's broader conceptual understanding of the construct. This development has, to varying degrees across each field, added considerable nuance and insight to researchers' understanding of each construct, attesting to the positive affect that iterating through the measurement-theory cycle can have on ultimate theoretical knowledge.

We see a similar pattern in Chapters 2 and 3 with respect to the research literatures on humility as well as experiential/material purchases and happiness. Chapter 2 detailed a program of research that re-defined the construct of humility (i.e., by showing empirically that humility can come in two distinct flavors), introduced preliminary new tools with which to measure each form of this more complex version of humility, and began to locate both appreciative and self-abasing humility within a preliminary nomological network. Chapter 3 detailed a program of research that re-defined happiness regarding a discretionary purchase (i.e., by presenting a model in which happiness regarding a purchase can take the anticipatory, momentary, and afterglow form; Dunn & Weidman, 2015), and showed that directly measuring momentary happiness can yield a starkly different portrait of the relative benefits of experiential and material purchases

compared to when afterglow happiness is measured. Both of these developments have added nuance to the researchers' understanding of humility and happiness, thereby complimenting prior work in these domains and laying a foundation for future researchers to study these constructs in a manner that fully capitalizes on their complex, multidimensional nature.

5.1.2 Insight 2: Iteration is heterogeneous

It should be clear from the preceding pages that the exact course with which a given subfield progresses through the measurement-theory cycle, as well as the specific factors that facilitate or impede iteration, vary considerably. Collating a list of these factors can shed additional light on the process of construct validation and revision. The most notable factor that tends to spark iteration through the two-stage cycle appears to be the perception that a nomological network of empirical results (i.e., the dependent variables in Stage 2) is built into the very definition and measurement of a construct (i.e., the independent variable in Stage 2). For example, Mauss' measure of valuing happiness included a number of statements reflecting anxiety and worry over one's well-being, virtually guaranteeing that it would relate to undesirable psychological outcomes, whereas Raskin's measure of narcissism contained a preponderance of items reflecting adaptive components of the construct, virtually guaranteeing that it would portray a relatively rosy picture of narcissism in interpersonal contexts. Similarly, Tangney operationalized shame with statements capturing avoidant disengagement from situations in which one had transgressed, whereas she operationalized guilt as involving approach-related engagement with those situations, again virtually guaranteeing that shame would be portrayed as maladaptive and guilt as adaptive.

Critics of the initial definition and measurement of these three constructs have, not surprisingly, focused their skepticism on this confounding of the hypothesized convergent,

discriminant, and predictive validity of these constructs, with the content of the items contained in their measures (e.g., Ackerman et al., 2011; Cohen et al., 2011; Parks & Layous, 2016; Pincus & Lukowitsky, 2010; Tignor & Colvin, in press). The work on humility presented in Chapter 2 was motivated by a similar insight, namely that researchers' collective decision to define and measure humility as a socially desirable, positive construct, virtually guaranteed that it would be shown to predict a host of desirable outcomes (Weidman & Tracy, in press). The point here is that, by building empirical effects into a measure of a construct, one does not really leave open the opportunity to test the hypothesis that the construct indeed has those empirical effects.

A second factor that prompts iteration is the perception that the initial definition or measurement strategy for a single construct in fact captures a multidimensional construct, and that the field would be better off splitting that construct into multiple constructs, each of which would garner separate empirical inquiry. For example, initial *DSM-III* definitions of narcissism, codified in the NPI, were later shown to capture a relatively heterogeneous set of components (e.g., Ackerman et al., 2011), leading the field to re-conceptualize narcissism as split into the distinct constructs of grandiose and vulnerable narcissism (Campbell & Miller, 2011; Pincus & Lukowitsky, 2010). Similarly, the primary source of debate over how to define and measure depression concerns whether or not to conceptualize the cognitive and somatic factors as independent constructs in their own right; proponents of such a split advocate for the use of subscales instead of relying on a sum-total score to index depression (e.g., Brouwer et al., 2013; Huang & Chen, 2015; Ward, 2006; Vanheule et al., 2008).

A third factor that tends to facilitate iteration is the presence of researchers from multiple areas of psychology all studying the same construct. Case in point here is narcissism: Much of the opposition to the use of the NPI, and its tendency to capture the more grandiose and adaptive

components of narcissism, came from clinical psychologists whose theoretical conceptualization of the construct aligned more with the more vulnerable side of the construct (e.g., Pincus & Lukowitsky, 2010). Moreover, whereas clinicians spearheaded the first efforts to develop alternative measurement tools specifically capturing vulnerable narcissism (e.g., Hendin & Cheek, 1997; Pincus et al., 2009), several influential social-personality psychologists still maintain that the NPI total score is a valid and sufficiently nuanced tool with which to capture narcissism (Miller & Campbell, 2011). In the case of narcissism, divisions *within* social and personality psychology have also spearheaded efforts to revise the definition and measurement of the construct; although as noted above some social psychologists remain loyal to the NPI, two of the most fruitful efforts to re-conceptualize narcissism have come from research groups with primary affiliations to personality psychology (e.g., Ackerman et al., 2011; Back et al., 2013).

At the same time as the above factors facilitate iteration, certain factors can impede iteration. Principal among these is inertia; all else being equal, it is easier to proceed with empirical research while using well-accepted definitions of and measurement tools for a construct than to reinvent the wheel by re-defining a construct or creating a new scale. Part of the reason for this inertia stems from the issue of burden of proof, namely that an existing scale is presumed to be a valid indicator of a construct until sufficient evidence accumulates to the contrary. For example, in the case of narcissism, proponents of the NPI have noted that, despite its known flaws, any measure wishing to supplant it as a modal tool for assessing narcissism must first surpass the high bar of construct validation that the NPI has achieved over the past three decades; this would include showing both convergent correlations with official diagnostic criteria for narcissism, and showing equivalent or superior ecological validity in predicting real-life outcomes (Miller & Campbell, 2011). A second reason for inertia concerns the need for

coherence within a subfield, namely that it is much easier to integrate individual studies into a coherent body of knowledge about a construct when each of those studies uses the same measure of the construct, then when multiple measures (which potentially capture different versions of the construct) are used across studies. For example, in the case of depression, Bagby and colleagues (2004) noted that, if the HRSD could be revised to account for its psychometric and content problems rather than being outright replaced, such a development would help maintain continuity with the preceding decades of research on depression.

5.1.3 Insight 3: Beware of two-sided constructs

As noted above, one factor that typically facilitates iteration is the perception that a construct is multidimensional and would be better off split into multiple, independently studied constructs. Although iteration through the two-stage cycle typically enhances the field's knowledge of a construct, one form of iteration that involves splitting multidimensional constructs may be somewhat problematic: The formulation of two-sided constructs consisting of one dimension characterized by socially desirable attributes, and one dimension characterized by socially undesirable attributes. Over the past decade, a spate of constructs have been formulated in just this manner; in the current dissertation, I have already discussed the two-sided nature of narcissism (grandiose vs. vulnerable narcissism), valuing happiness (Mauss' [2011] formulation vs. Catalino and colleagues [2014] prioritizing positivity), and humility (appreciative vs. self-abasing humility). In addition, similar two-sided models have been presented for pride (where socially desirable authentic pride is contrasted with socially undesirable hubristic pride; Tracy & Robins, 2007) and envy (where socially desirable benign envy is contrasted with socially undesirable malicious envy; Lange & Crusius, 2015; van de Ven, Zeelenberg, & Pieters, 2009).

Splitting constructs into socially desirable and undesirable dimensions is potentially problematic because such a split could be an artefactual result of the manner in which people respond to self-report questionnaires. Social desirability (sometimes referred to as evaluative valence) is the primary dimension upon which individuals rate their traits and dispositional emotional experiences, a fact that has been recognized by personality psychologists for over half a century (Edwards, 1957). Recent empirical data supports this assertion. In one study, participants were asked to complete self-report ratings of Big Five traits on the 120-item NEO-PI-R, and these ratings were subjected to a principal components analysis in which one general personality factor was extracted; the profile of each item's loading on this factor correlated .93 with ratings of each item's social desirability, as rated by a separate sample (Pettersson et al., 2012). In a second study, an identical analysis with self-reports of 39 emotion adjectives yielded a correlation of .96 between each item's loading on the first principal component and independent ratings of each item's desirability (Pettersson & Turkheimer, 2013). All of this implies that, if a large set of items related to a construct such as narcissism, humility, or envy are generated, it is almost certain that factor analytic procedures can be used to show that subsets of these items group together into socially desirable and undesirable dimensions. To quote an anonymous reviewer of the humility manuscript presented in Chapter 2: "I think it is fairly easy, because of the negative and positive valence issues that pervade personality, to show that any particular construct has negative and positive features."

In light of the fact that a methodological artefact can produce the appearance of a two-sided construct, it seems important for researchers to take explicit steps to ensure that any revised definitions and measurement tools for a construct are not simply products of differences in social desirability. One promising solution is to take statistical steps to control for social desirability

such as factor analyzing residual scores after evaluative valence is removed, or running exploratory structural equation modeling (ESEM; Asparouhov & Muthén, 2009; Pettersson et al., 2012); as seen in Chapter 2, this procedure can help demonstrate that the two-sided structure of a construct such as humility emerges even after variance due to social desirability is isolated from variance due to content inherent to the construct. However, these procedures are not panaceas, and employing them typically exposes the profound effect of social desirability in shaping the structure of a construct. For example, in Chapter 2, the two-factor structure of humility accounted for 42 and 39 percent of the variance in humility items for state and trait experiences, respectively, before evaluative valence was removed, but only 31 and 24 percent of the variance after valence was removed. Similarly, the pattern of factor loadings obtained prior to controlling for social desirability using ESEM showed a congruence coefficient of .85 and .62 for state and trait experiences, respectively, with the pattern of loadings obtained after using ESEM; these coefficients indicate less-than-optimal convergence across solutions (Lorenzo-Seva & ten Berge, 2006). These findings demonstrate that the two-sided structure of a construct such as humility might continue to emerge to a modest extent after social desirability is controlled, but this pure two-sided structure will be a somewhat skewed version of the two-sided structure that emerged due to the influence of social desirability.

Taken together, the above findings point to the pervasive influence of social desirability on people's self-reported personality and emotion, and in turn the obtained structure of any personality or emotion related constructs. Two-sided structures are likely to characterize any construct through artefact alone, regardless of the construct's actual content, and statistical measures meant to remove socially desirable content often only expose its profound effect. When revising the definition of constructs or creating new measures, it follows that a more promising

solution to the influence of social desirability on self-report questionnaires is to prioritize and seek out alternative structures for constructs that do not simply diverge along positive vs. negative dimensions. The proposed multidimensional structure of depression is a good example of such a development, given that this construct is split along cognitive and somatic symptom dimensions, all of which are somewhat socially undesirable in nature (Beck et al., 1996; Huang & Chen, 2015). Ackerman and colleagues (2011) three-factor model of narcissism also achieves this goal to a partial degree; although their Leadership/Authority factor is clearly desirable, and their Exploitativeness/Entitlement factor is clearly undesirable, their Grandiose Exhibitionism factor falls somewhere in between (though its nomological network is more closely aligned with Leadership/Authority); this model therefore provides a more nuanced portrait of the construct than is apparent in the two-sided grandiose vs. vulnerable model. The hope here is that Stage 1 of future measurement-theory cycles sees the development of similarly nuanced models, and a reduced reliance on redefining constructs along socially desirable vs. undesirable lines.

5.2 Where does distinct positive emotion research go from here?

Having now reflected extensively on the intricacies of the two-stage cycle through which measurement and theory are linked, it is time to turn our attention to the central focus of this dissertation: Momentary distinct positive emotions. As noted in Chapter 1, this field underwent a somewhat incomplete first pass through Stage 1 of the measurement-theory cycle; although many researchers derived theory-based definitions of distinct positive emotions, no consensual and validated scales were constructed to measure these states in research contexts. Despite this lack of attention to measurement in Stage 1, the field marched on to Stage 2, and numerous empirical papers were published annually examining the causes, correlates, and consequences of distinct positive emotions. In lieu of reliance on validated self-report measurement tools,

researchers in the field typically rely on ad-hoc, single-item measures which do not adequately capture the complex subjective experience of positive emotions, and show considerable empirical inconsistency and overlap across studies.

The time therefore appears ripe to iterate back to Stage 1 of the measurement-theory cycle, and construct comprehensive self-report measures that can be used to support the burgeoning field of empirical inquiry into distinct positive emotions. Chapter 4 of this dissertation had exactly this goal. In particular, Part 1 of that chapter presented a series of studies in which bottom-up, empirically based definitions were outlined for each positive emotion frequently studied in the current empirical literature, and these definitions were used as the basis for constructing self-report measures for each emotion. The hope in conducting that research is that the resultant scales will provide researchers with tools that adequately capture the diverse components that comprise each positive emotion as experienced by lay persons, and that can be used in a consistent manner across studies, thereby facilitating comparisons and integrations of multiple empirical effects into a cumulative literature on positive emotions.

Of course, by this point in the dissertation, it should be clear that constructing self-report scales is just one part of the measurement-theory cycle through which the field will hopefully continue to iterate over the coming years. Toward what end will this measurement-focused work ultimately lead? As noted in Chapter 4, I believe that the field would be well-served by arriving at a consensual and overarching taxonomy of subjectively experienced distinct positive emotions. In what follows, I will take this a step further, and outline an agenda that might move the field toward an *overarching taxonomy of universal, basic positive emotions*, a somewhat loftier goal with historical parallels to seminal work in distinct emotion science. The subsequent pages will be dedicated to discussing the specifics of what might come after the development of

the self-report scales presented in Chapter 4 if the field is to achieve this goal. I will first hypothesize what the next procession through Stage 2 of the cycle might look like, before hypothesizing what a subsequent iteration back to Stage 1 might look like.

5.2.1 Stage 2: Vetting the construct(s)

Now that comprehensive, bottom-up measurement tools have been formulated for each distinct positive emotion typically studied in the literature, the stage is set for the field to use these tools to examine the convergent, discriminant, and predictive validity of each emotion as assessed in its full complexity and distinctiveness. Broadly speaking, I see two theoretical goals that could be serviced by this type of research, each of which contributes toward the ultimate goal of arriving at an overarching taxonomy of universal, basic positive emotions: (a) Determining exactly how many positive emotions are subjectively experienced as distinct; and (b) Determining which of these distinct positive emotions are universal and basic. Below I discuss each of these goals in turn.

5.2.1.1 Goal 1: Determining which positive emotions are subjectively distinct

Pursuing this first goal will help the field arrive at an overarching taxonomy of subjectively experienced positive emotions. The taxonomy of positive emotions presented in Chapter 4 was primarily pragmatic in nature, in that this research began with the goal of uncovering the content of each positive emotion studied in the literature, constructing a scale for each, and then mapping the interrelatedness of each of these positive emotions. Along the way, we were very lenient when considering the question of whether a given positive emotion that is studied in the literature should in fact be considered distinct; we considered each positive emotion to be distinct if it was represented by a latent factor comprised of experiential components that could then be used to create a self-report scale, regardless of how strong of a

correlation emerged between any two scales representing distinct emotions. This analytic strategy resulted in the retention of 17 positive emotions in a preliminary taxonomy, and the elimination of only one emotion (compassion) that was not represented as a distinct factor, as well as the merging of two emotions (contentment and happiness) into one factor.

However, in satisfying the broader goal of arriving at a taxonomy of subjectively experienced positive emotions, it is necessary to employ more formal statistical tests of each emotion's distinctiveness. One reason is that, even if two or more positive emotions emerge as distinct factors (as we found in Chapter 4), the scales representing these emotions may show strong, positive correlations, indicating a level of empirical overlap that could potentially render any distinctions between the two emotions conceptually uninteresting and/or pragmatically useless in explaining or predicting human behavior. A second and more serious reason is that the methodology we employed in Chapter 4 tipped the scales in favor of each positive emotion typically studied in the literature emerging as a distinct experience; by grouping each positive emotion *a priori* into categories consisting of 3-4 emotions, we effectively shielded each emotion from emerging as *not distinct from* any other positive emotion that was not in its original group. For example, although tenderness emerged as a distinct factor in an item pool comprised of subjective components for empathy, sympathy, and compassion, we never tested whether the components making up tenderness would form a distinct factor if included in the same analysis as the components thought to comprise attachment love, romantic love, or nurturant love. In light of the strong correlation that emerged in Part 2 of Chapter 4 between tenderness and attachment love in particular, as well as the broad conceptual similarities in researchers' definitions of tenderness and each form of love (e.g., Buckles et al., 2015; Berscheid, 2010; Shiota et al.,

2014), it seems important to formally test whether tenderness is in fact distinct from each form of love before concluding that is in fact a distinctively experienced positive emotion.

In conducting these more formal tests, and moving beyond the relatively loose methods and statistical procedures used in Chapter 4 to answer the question of how many positive emotions involve distinct subjective experiences, it will be important for researchers to adjudicate between three possible models that might be used to formulate a taxonomy of distinct emotions. One model—which we will call the maximal distinctness model—posits that each of the 17 positive emotions currently studied in the literature is in fact experienced distinctly. This model conveniently aligns with researchers' current beliefs and empirical practices, so it has some pragmatic benefits. Yet it is not a very parsimonious model with which to map the variety of human positive emotion experience, because it requires a separate theoretical account of the elicitors of each positive emotion, and both their proximal and ultimate adaptive functions.

One alternative and more parsimonious model—which we will call the emotion family account—posits that subsets of these 17 emotions can be grouped into higher-order emotion families (e.g., Ekman, 1992). For example, perhaps tenderness and attachment love both capture a similar emotional experience involving feelings of closeness to a loved one (in fact, these two emotions correlated .53, the highest of any pair of emotions, in the Study 4 of Chapter 4). Similarly, maybe empathy, sympathy, and nurturant love all cluster together in an emotion family capturing compassionate and caring feelings toward someone in need (Goetz et al., 2010). Finally, perhaps gratitude and admiration group together in an emotion family capturing appreciative feelings toward another individual's abilities or behavior (Algoe & Haidt, 2009). Regardless of the exact composition these families take, their emergence has the potential to

reduce the clutter of constructs that currently characterizes the positive emotion landscape, and therefore simplify researchers' understanding of the variety of positive emotion experience.

A third and even more parsimonious model of the positive emotion landscape—which we will call the pleasant affect account—is one in which general pleasant affect is seen as a fundamental building block of emotional experience, and more distinct positive emotions merely reflect variations in the external situational factors in which that pleasant affect is experienced (e.g., Barrett, 2012; Russell, 2003). For example, if an individual is feeling pleasant in the context of having just aced a final exam, this feeling will be conceptualized as pride. Similarly, if an individual's pleasant affect arose as a result of a friend buying him a gift, that feeling will take the form commonly known as gratitude. Finally, if an individual feels pleasant affect late at night in the bedroom alongside her partner, that feeling will be labeled as romantic love. Across all of these examples, the clear implication is that the field does not need a taxonomy consisting of 17 purportedly distinct positive emotional states, but rather only needs one state (pleasant affect), as well as a recognition that different situational and interpersonal factors that might cause the core pleasant affect state to be conceptualized distinctly across contexts.

There are two broad families of tests that are typically conducted during the next procession through Stage 2 of the measurement-theory cycle which could shed light on question of how many positive emotions are subjectively experienced as distinct, and in turn help adjudicate between the three models outlined above. First, higher-order factor-analysis of all 17 positive emotions—either using the 17 scales presented in Chapter 4 or the 101 items comprising those scales—could be used to empirically test these possibilities. This analysis could conceivably yield a 17-factor solution (supporting the maximally distinct framework), a 1-factor solution (supporting the pleasant affect framework), or a solution somewhere in between

(supporting the emotion family framework). Again, given that the initial input to this factor analysis was a list of over 2,500 subjective positive emotional components, it is likely that the higher-order structure that emerges here would provide a fairly definitive answer to the question of how many positive emotions are subjectively experienced as distinct.

A second broad family of tests which could help adjudicate between different taxonomies describing the positive emotion landscape concern predictive validity. Research examining predictive validity will inform the broader taxonomy question to the extent that it includes critical tests of the unique predictive power of a given positive emotion, over and above other closely related positive emotions, and over and above pleasant affect. In the first case, it may prove helpful for a researcher interested in the predictive validity of one focal emotion to identify highly correlated positive emotions, and to compare the predictive validity of the correlated emotions to that of the focal emotion. For example, based on the high correlation between tenderness and attachment love shown in the network analysis of Chapter 4, a researcher who wishes to test the predictive validity of tenderness might control for attachment love in a simultaneous regression model, and in addition might substitute attachment love for tenderness as the sole predictor in that model. Conducting these types of rigorous control analyses will tell the researcher whether tenderness has any unique predictive power above and beyond attachment love, which will provide a clue regarding the relative distinctness or overlap between these two emotions. To the extent that a researcher finds evidence that tenderness and attachment love—or any pair of distinct positive emotions—have redundant predictive validity, such evidence would support the possibility that those two emotions may in fact be part of an emotion family.

In isolating the predictive power of one distinct positive emotion from that of pleasant affect, a similar set of analyses could prove useful. Specifically, a researcher who wishes to test

the predictive validity of one emotion could do so while controlling for pleasant affect, and also could substitute pleasant affect for the emotion, to see if pleasant affect can predict the outcome of interest equally well as the focal emotion. This type of test might be especially important in the case of positive emotions which showed high correlations with pleasant mood in Chapter 4 (e.g., contentment, authentic pride, nurturant love). To the extent that pleasant affect can predict all of the outcomes that a distinct positive emotion can predict, it would provide one piece of evidence that the positive emotion in question is not a useful construct for the field to be studying as a separate entity, and would instead support the overarching explanatory power of pleasant affect. Broadly speaking, these types of rigorous tests of predictive validity—involving controls for closely related positive emotions and pleasant affect—can therefore feed back into the field’s overarching knowledge of the taxonomy of positive emotions, and exactly how many of these states are subjectively experienced as distinct.

5.2.1.2 Goal 2: Establishing basicness of distinct positive emotions

This second goal concerns the generalizability of a set of positive emotions or emotion families that results from the research presented and discussed thus far. The data in Chapter 4 of this dissertation suffer from two broad methodological limitations, namely that they rely entirely on self-reported emotional experience, and they rely entirely on Western cultural samples. Both of these limitations constrain the conclusions that can be drawn from this data, as well as from any Stage 2 research on convergent, discriminant, and predictive validity that relies on the scales and network analyses presented in Chapter 4. One might conclude that Chapter 4, as well as Goal 1 above, are well positioned to construct an authoritative *taxonomy of subjectively experienced positive emotions among individuals of Western cultural backgrounds* (henceforth the

“subjective taxonomy”), which is a worthwhile goal, but is also a far cry from constructing an overarching *taxonomy of universal, basic positive emotions* (henceforth the “general taxonomy”).

This section will outline work that could help construct the latter, general taxonomy, and in doing so will focus on the question of whether certain positive emotions found in the subjective taxonomy meet the criteria to be considered basic positive emotions. Answering the question of which positive emotions are basic has the potential to generate considerable research progress by focusing the wealth of empirical attention currently dedicated to positive emotions on a succinct set of states with consensually recognized importance. A similar development occurred in the 1960s and 1970s in the field of affective science, when Paul Ekman’s seminal work identifying the six basic emotions of anger, disgust, fear, happiness, sadness, and surprise sparked decades of empirical inquiry into the nature of these states (e.g., Ekman & Friesen, 1971; Ekman et al., 1987). I will focus in particular on three pieces of evidence often used to substantiate the claim that a given emotion is basic: (a) the existence of a universal non-verbal expression; (b) the existence of a distinct physiological response; and (c) cross-cultural equivalence of an emotion’s structure (e.g., Ekman, 1992; Tracy & Randles, 2011). Although there are additional evidential criteria that might be used to support the contention that an emotion is basic (e.g., distinct neural substrates, expression in non-human animals), I focus on these three because each of them follows somewhat directly from work constructing the subjective taxonomy, and from work presented in Chapter 4.

A first important line of work concerns the question of whether a given positive emotion is associated with a unique non-verbal expression. Historically, facial expressions have perhaps been the primary source of evidence used to buttress the claim that emotions are basic and universal, a trend that traces back to Ekman’s seminal work (e.g., Ekman & Friesen, 1971;

Ekman et al., 1987). This trend has continued in the past two decades, as researchers have used evidence that emotions such as embarrassment and pride are associated with distinct expressions to argue that these emotions may meet some of the criteria to be added to the pantheon of basic emotions (Keltner, 1995; Tracy & Robins, 2004). On the flip side, opponents of the position that emotions are universal, basic psychological states have often used inconsistencies and confusion among participants asked to match facial expressions to individual emotion labels as evidence supporting their claim (e.g., Carroll & Russell, 1998; Russell, 1994); for example, recognition rates are often lower when participants are forced to generate an emotion label for a face (vs. choose a label from a pre-defined set), or when participants are presented with contextual information that contradicts the emotion expression. These trends together point to the importance of identifying which positive emotions are associated with distinct non-verbal expressions, to provide initial evidence regarding these emotions' fundamental nature.

A second important line of work concerns the question of whether a given positive emotion elicits a distinct physiological response. Although work on physiological responses has not been as popular or contentious over the years as work on facial expressions, it has still played a large role in substantiating the claim that certain emotions are basic. Early work in this domain showed that profiles of autonomic nervous system activity (e.g., heart rate, finger temperature) were distinct among individuals experiencing different negative emotions (e.g., anger, disgust, fear, sadness; Ekman, Levenson, & Friesen, 1983; Levenson, Ekman, & Friesen, 1990). In more recent years, distinct physiological responses have been used as evidence to support claims regarding the functionality and universality of additional emotions. For example, one series of studies found that individuals who experience compassion show heightened activity in the vagus nerve, a part of the parasympathetic nervous system that is associated with communal motivation

and affiliative behaviors (Stellar, Cohen, Oveis, & Keltner, 2015). These types of findings have been used to buttress the claim that compassion may be a universal emotion that functions to promote care for closely related others (e.g., Goetz et al., 2010; Stellar & Keltner, 2014). Similar work focusing on other positive emotions would go a long way toward supporting the notion that various distinct positive emotions are in fact basic and universal.

A third important line of work concerns the cross-cultural equivalence of the structure of distinct positive emotions. Cross-cultural data regarding many features of distinct emotions—including facial expressions—has historically and more recently been used to buttress the claim regarding those emotions' basic and universal nature (e.g., Ekman et al., 1987; Tracy & Robins, 2008). Evidence speaking to the cross-cultural equivalence of positive emotion structure is particularly essential in determining the extent to which the subjective taxonomy constructed using research described above would take a similar form as the general taxonomy of positive emotions. Emotions are known to often have very different meanings to individuals from different cultures (Heider, 1991; Russell, 1991a), suggesting that the content and structure of any one positive emotion identified in Chapter 4 may not generalize to individuals from non-Western cultures. Several recent studies speak directly to this issue; for example, one recent study demonstrated that awe can come in two forms, one linked to positive feelings about the world, and another linked to threatening feelings stemming from one's environment, and these authors suggested that the threat-based version of awe would be more prevalent in non-Western cultures (Gordon, Stellar, Anderson, McNeil, Loew, & Keltner, in press). In contrast, another recent study found that the structure and content of the subjective pride experience takes a similar form among Chinese and Korean participants as it has been shown to take among Westerners (Shi,

Chung, Cheng, Tracy, Robins, Chen, & Zheng, 2015). More of these types of investigations are needed to determine the equivalency of positive emotional structure across cultures.

In sum, if evidence begins to amass regarding the non-verbal signals, physiological responses, and cross-cultural structure of the 17 positive emotions identified in Chapter 4—or higher-order emotion families that emerge as combinations of two or more of these 17 emotions—it will go a long way toward answering the question of whether these emotions are universal and basic human experiences. Establishing this fact will in turn facilitate the construction of a general taxonomy of positive emotions that is applicable across cultures, which will provide much more broadly useful insight than the subjective taxonomy whose origins were outlined in Chapter 4 and in the preceding section on Goal 1.

Yet, it is intentional that Goals 1 and 2 of Stage 2 were listed in the chosen order. Specifically, one could argue that the objectives of Goal 1—to establish a taxonomy of subjectively experienced positive emotions among individuals from Western cultures—is a necessary prerequisite for conducting the research outlined in Goal 2. For example, to study the non-verbal expression or physiological response associated with gratitude, a researcher must at various points define gratitude for participants, and use a measure of gratitude as an independent variable or manipulation check. Similarly, if one wishes to examine the structure of gratitude in a non-Western culture, it is informative to be able to draw comparisons with the previously obtained structure from Western cultures. In each of these scenarios, it will therefore be helpful to first know what exactly the subjective content of gratitude is, to have a sound way to measure it, and to know whether it is in fact a distinct experience compared to other related positive emotions. Each of these goals is facilitated by answering the questions inherent to Goal 1, as well as Stage 1 of the measurement-theory cycle. If a general taxonomy of basic, universal positive

emotions is an ultimate goal for the field, it follows that research at Stage 1 and Goal 1 of Stage 1 lays the foundation for this ultimate goal.

5.2.2 Iteration back to Stage 1

In the preceding sections I have described a research agenda for the field of distinct positive emotions that would ideally culminate in the creation of a true taxonomy of universal, basic positive emotions, and I have suggested that the definitions and measurement tools for positive emotions formulated in Chapter 4 represent a second pass through Stage 1 research, and lays the groundwork for this ultimate taxonomy. In line with the two-stage measurement-theory process, it is equally important to note that at some point in the future the field of distinct positive emotions will iterate yet again back to Stage 1 of the measurement-theory cycle. This iteration will of course involve substantial revisions to, or elimination of, the definitions and measurement tools proposed in Chapter 4, and the revision of the researchers' collective understanding of specific positive emotions.

How exactly might this iteration play out? Several possibilities come to mind. First, and most simply, Stage 2 research could reveal that one or more of the 17 positive emotions defined and measured in Chapter 4 are not in fact distinct psychological states, but are redundant with other positive emotions, therefore leading to the elimination of the associated construct and measurement tool from the empirical literature. If forced to select one such emotion, I would predict that tenderness will experience a short shelf life in the field, given that it shows considerable conceptual and empirical overlap with all three forms of love (i.e., attachment love, nurturant love, and romantic love), and that these three forms of love have a much richer history in the field compared to tenderness (e.g., Berscheid, 2010; Buckels et al., 2015; Shiota et al., 2014). Furthermore, tenderness is typically measured with the word "compassionate", suggesting

some overlap with that emotion (Buckles et al., 2015). If tenderness does indeed merge with one or more forms of love, or with compassion, in a higher-order factor analysis, or if it fails to show predictive power above these other emotions, the tenderness scale presented in Chapter 4 will become obsolete.

A second form of iteration may involve substantial revision of one or more of the positive emotion definitions and measurement tools presented in Chapter 4. For example, subsequent research could show that one of these positive emotions consists of a more complex and multidimensional set of components than is possible to capture in the relatively succinct definitions and brief measurement tools presented in Chapter 4. One such candidate appears to be awe, which as noted above may in fact take two rather distinct forms, involving either positive feelings or a sense of threat and fear (Gordon et al., in press). A second such candidate may be empathy, which as noted in Chapter 1 is often thought to include a relatively broad and diverse set of components, including emotional sharing (i.e., feeling the same emotions as another person), empathic concern (i.e., showing care for another's plight), and perspective-taking (i.e., imagining what another person is going through; Decety & Cowell, 2014; though see Wondra & Ellsworth, 2015; and Zaki, 2014, for alternative definitions). In the cases of awe and empathy, the scales presented in Chapter 4 may capture an overly narrow, restrictive definition of the construct—ironically, not unlike the single-item measures currently used in the field—and therefore the field will need to revise its definition and measurement tool for these states in order to adequately match their complex nature; this will again render the previously constructed awe and empathy scales obsolete.

A third possible iteration may involve the creation of a new definition and scale to capture a broader, higher-order positive emotion; for example, two of the 17 positive emotions

identified in Chapter 4 may coalesce to represent one positive emotional experience which cannot be captured by either of the individual definitions or measurement tools alone. My prediction here is that the field ultimately embraces a formulation of compassion that subsumes the entire set of components currently thought to comprise empathy and sympathy, as well as some content thought to comprise tenderness. The most prominent current accounts of compassion contend that it is a broad experience that arises when witnessing another's suffering and that motivates a subsequent desire to help, and that it subsumes more specific helpfulness and altruistic feelings such as empathy and sympathy (Goetz et al., 2010; Stellar & Keltner, 2014). As a result, although compassion did not emerge as a distinctly experienced positive emotion in Chapter 4, it may well emerge in the future as a higher-order positive emotional experience. If this does play out, I also predict that the field will move toward a model in which compassion is viewed not so much as a narrow positive emotion, but more like an emotion plot, or involving particular cast of characters (in the case of compassion, someone in need), a relatively clear script of events (in the case of compassion, an opportunity to help that person), and comprising several narrower distinct emotional experiences (in the case of compassion, empathy, sympathy, and tenderness; Ekman, 1992). If the field does move toward this broader conceptualization, it will require a new measurement strategy, rendering the narrow empathy and sympathy scales in Chapter 4 obsolete.

Finally, a fourth possible iteration, and one also involving the creation of a new definition and scale, is that researchers could discover that a positive emotion that was not included among the 17 discussed in Chapter 4 in fact deserves inclusion in an overarching taxonomy of positive emotions. Frankly, I predict this form of iteration will not take place; Chapter 4 began with a list of over 2,500 subjective positive emotional components, and covered a list of the most

frequently studied positive emotions in the literature (Weidman et al., in press), so it seems unlikely that a truly distinct positive emotion experience fell through the cracks. Perhaps one possibility for introduction into the taxonomy is elevation, a state which has been defined as a warm, uplifting feeling that people experience when they see unexpected acts of human goodness, kindness and compassion (Haidt, 2000), and has garnered some attention from researchers interested in the function of people's emotional responses to witnessing moral or virtuous actions of others (e.g., Algoe & Haidt, 2009; Lai, Haidt, & Nosek, 2014; Silvers & Haidt, 2008). However, I am not aware of any work that has conclusively shown that elevation consists of a distinct set of subjective components compared to admiration, another emotion known to be associated with witnessing valorous deeds of others. This overlap is apparent in the definition of elevation (i.e., one could easily label a positive feeling toward acts of goodness, kindness, and compassion, as "admiration"), as well as the components found in Chapter 4 to comprise admiration. In light of these issues, of the possible patterns of iteration outlined above, it seems safest to conclude that the fourth is the least likely to occur.

5.3 Conclusion: Is the present an arbitrary line in the sand?

At this point, readers may wonder whether the preceding discussion of where the field of distinct positive emotions has been, and where it is going, constitutes one exceptional delusion of grandeur. In line with my proposal for the second pass through Stage 1 of the measurement-theory cycle, I have argued that the work presented in Chapter 4 of this dissertation lays the foundation for the field to accomplish the lofty and far-reaching goal of creating a taxonomy of universal, basic positive emotions, by providing initial definitions and measurement tools for each positive emotion currently studied. Why, one might ask, should the present set of definitions and measurement tools represent the official starting point for such an audacious

endeavor as mapping the entire domain of positive emotional experience? Surely such an argument naively discounts the breadth of scholarly inquiry into positive emotions since the turn of the century, when Fredrickson (1998) published her influential Broaden-and-Build theory of positive emotions. As noted in Chapters 1 and 4, the last decade has seen a spate of publications on distinct positive emotions in the field's top-tier journals, a trend which produced enough scientific material to fill the pages of an entire handbook dedicated to the science of positive emotions (Tugade et al., 2014).

Although I acknowledge that the considerable amount of prior work on positive emotions represents an initial accumulation of a knowledge base, and has certainly influenced the definitions and measurement tools formulated in the present work, I would tentatively predict that this work is poorly suited to contribute to the development of an overarching taxonomy of positive emotions. This is because nearly all work to date on subjectively experienced positive emotions has been conducted in a piece-meal fashion, such that individual laboratories have studied individual positive emotions largely in isolation from other laboratories and emotions, and have defined and operationalized these emotions in scattered, inconsistent, and conceptually overlapping ways. None of these circumstances is conducive to building a cumulative knowledge and science of positive emotions, and therefore the potential for findings made within this scattered framework to contribute to a broader taxonomy seems limited.

A historical comparison to personality psychology is again apt here. The state of distinct positive emotion research today mirrors the state of that field in the 1980s, prior to the advent and popularization of the Big Five taxonomy. As summarized by John and colleagues (2008):

“Since...the last 1980s, the field of personality trait research has changed dramatically.

At that time, the Big Five personality dimensions, now seemingly ubiquitous, were

hardly known. Researchers, as well as practitioners in the field of personality assessment, were faced with a bewildering array of personality scales from which to choose, with little guidance and no organizing theory or framework at hand. What made matters worse was that scales with the same name might measure concepts that were quite different, and scales with different names might measure concepts that were quite similar. Although diversity and scientific pluralism can be useful, systematic accumulation of findings and communication among researchers had become almost impossible amidst the cacophony of competing concepts and scales” (John et al., 2008, p. 114).

The parallels between this description of personality psychology prior to 1990 and positive emotion science today are manifold: A bewildering array of emotions, no organizing framework, confusion and inconsistency in measurement, and laboratories operating in relative isolation.

History tends to repeat itself, and the hope here is that in the coming years the trajectory of distinct positive emotion research will continue to mirror that of personality psychology nearly three decades ago. Personality psychology was rescued from the abyss by the Big Five, an overarching taxonomy which provided a common language and consensual measurement tools for researchers across laboratories to use when studying personality’s profound effect on human behavior. As a result, the Big Five has become the dominant paradigm within which the majority of personality psychology research is conducted, and several of the more idiosyncratic models of personality that were popular before the advent of the Big Five have fallen into obscurity (John et al., 2008).³⁴ Perhaps positive emotion science will follow this arc, such that the work presented herein will represent the initial stake for a universal taxonomy, which will provide a common language and tools with which to study positive emotions. Such a development would

³⁴ In line with the iterative nature of the measurement-theory cycle, however, several revisions and extension of the personality trait space have recently gained traction (e.g., Ashton & Lee, 2007)

reduce the current clutter that characterizes the field while at the same time *increasing* the frequency and feasibility with which researchers study positive emotions across a range of important life domains. Will the field one day unify around such a “Positive Emotion Big Five”? One can always dream.

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