PREDICTING AND CHANGING AVOIDANCE GOALS IN SOCIAL INTERACTION
ANXIETY

by

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Abstract

Social anxiety is associated with social performance deficits, interpersonal problems, and negative affective responses to social interactions. It has also been linked to reduced approach motivation and enhanced avoidance motivation. Models of self-regulation (e.g., Gable, 2006) suggest that social goals may contribute to interpersonal and affective difficulties, yet little research has addressed this issue in the context of social anxiety. The present studies evaluated a hierarchical model of approach and avoidance in social interaction anxiety, with affect hypothesized to be a mediating factor in the relationship between general motivational tendencies and idiographic social goals. This model was developed and refined using questionnaire data from a sample of 186 undergraduate students and was cross validated in a second sample of 195 undergraduates. The findings support hierarchical relationships between general motivational tendencies, social interaction anxiety, affect, and social goals. Interestingly, positive affect inversely predicted social avoidance goals in both samples. Based on these findings, a third study assessed whether a technique that increases positive affect also reduces social avoidance goals in social anxiety. A sample of 115 undergraduates high in social interaction anxiety were randomly assigned to one of three conditions: performing kind acts (AK; $N = 38$), a condition that has been shown to increase positive affect in socially anxious individuals (Alden & Trew, 2012); decreasing social avoidance (SA; $N = 41$), a condition that directly targets avoidance; and recording life details ($N = 36$), a standard emotionally neutral control condition (e.g., Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). The findings indicate that, although AK did not increase positive affect relative to the other two conditions, it did decrease social avoidance goals, an effect that was mediated by reductions in social anxiety. SA was associated with reduced social anxiety and increased relatedness need satisfaction, self-

esteem, and positive social activities. Although a reduction in social avoidance goals was not evident in this group at post-intervention, multilevel modelling analyses suggest that social avoidance may decrease with additional time. The implications of these findings for models of approach and avoidance, positive affect techniques, and the treatment of social anxiety are discussed.

Preface

A version of chapters 1, 2, and 3 has been published. Trew, J. L., & Alden, L. E. (2012). Positive affect predicts avoidance goals in social interaction anxiety: Testing a hierarchical model of social goals. *Cognitive Behaviour Therapy*, *41*, 174–183. doi:10.1080/16506073.2012.663402. I was responsible for conceptualizing and designing the research project, writing and submitting the research ethics proposal, recruiting participants, conducting and/or supervising all participant testing sessions, data management, data analysis, and writing up the results for publication, in consultation with my supervisor, Dr. Lynn Alden.

The first pages of chapters 1, 2, and 3 include footnotes with similar information.

All studies were approved by the University of British Columbia's Behavioural Research Ethics Board. The ethics certificate number for Studies 1 and 2 is H09-02277. The ethics certificate number for Study 3 is H07-02190.

Table of Contents

List of Tables

<h1 style="text-align:center">List of Figures</h1>

List of Abbreviations

AGFI   Adjusted Goodness of Fit Index

AIC   Akaike Information Criteria

AK   Acts of Kindness

ANCOVA   Analysis/Analyses of Covariance

BAS   Behavioural Activation System

BIS   Behavioural Inhibition System

BPNS-R   Basic Psychological Needs Scale – Relatedness

CBT   Cognitive Behavioural Therapy

CFI   Comparative Fit Index

DSA   Daily Social Anxiety

FFFS   Fight/Flight/Freeze System

FFS   Fight/Flight System

GFI   Goodness of Fit Index

I-NA-SF   NA as Measured by the I-PANAS-SF

IOS   Interpersonal Outcomes Scales

I-PANAS-SF International Positive and Negative Schedule Short Form

I-PA-SF   PA as Measured by the I-PANAS-SF

LD   Life Details

LM   Lagrange Multiplier

M   Mean

NA   Negative Affect

PA   Positive Affect

PANAS   Positive and Negative Affect Schedule

PGEP   Personal Goals Elicitation Procedure

RMSEA   Root Mean Square Error of Approximation

RSES   Rosenberg Self-Esteem Scale

SA   Decreasing Social Avoidance

SD   Standard Deviation

SE   Standard Error

SGQ   Social Goals Questionnaire

SIAS   Social Interaction Anxiety Scale

SIAS-S   Social Interaction Anxiety Scale Straightforward

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Dedication

For Neil, my partner in crime.

1 Introduction[1]

Social anxiety is the fear of social or performance situations in which an individual is exposed to unfamiliar people or possible scrutiny (American Psychiatric Association, 2000). It has been linked to a range of adverse social and emotional outcomes, including educational and professional impairment (see Fink et al., 2009, for a review), decreased social competence (Gramer, 2006), social performance deficits (e.g., Beidel, Rao, Scharfstein, Wong, & Alfano, 2010; cf. Norton, 2010; cf. Stravynski, Kyparissis, & Amado, 2010; Voncken, Alden, Bogels, & Roelofs, 2008), lower quality social interactions (Heerey & Kring, 2007), maladaptive interpersonal styles in close relationships (Davila & Beck, 2002), and higher negative affect (i.e., negative emotions) following social interactions (Kashdan & Roberts, 2006; Vittengl & Holt, 1998). Social interaction anxiety (i.e., a general fear of social interaction; Mattick & Clarke, 1998), a core feature of generalized social anxiety disorder (Alden, Taylor, Mellings, & Laposa, 2008), appears to be particularly problematic, as it is more closely linked to low perceived quality of life (Safren, Heimberg, Brown, & Holle, 1996), deficits in positive affect (i.e., positive emotions; Hughes et al., 2006; Kashdan, 2002), and low approach motivation (Kimbrel, Mitchell, & Nelson-Gray, 2010) than more specific forms of social anxiety such as speech anxiety. Models of self-regulation have linked social motives and goals, specifically approach and avoidance goals, to a range of outcomes, including social behaviour and emotional responses relevant to social anxiety (e.g., Gable, 2006). However, little research has addressed the role of social goals in social interaction anxiety. Social motives and goals may help to account for the interpersonal and emotional difficulties experienced by socially anxious individuals. By

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[1] A version of chapter 1 has been published. Trew, J. L., & Alden, L. E. (2012). Positive affect predicts avoidance goals in social interaction anxiety: Testing a hierarchical model of social goals. *Cognitive Behaviour Therapy*, *41*, 174–183. doi:10.1080/16506073.2012.663402

evaluating potential predictors of these social goals, it may be possible to identify interventions that will reduce problematic avoidance tendencies in social interaction anxiety.

The first two studies described in this dissertation develop and evaluate a model of approach and avoidance processes in social interaction anxiety that examines affect as a possible mediator in the relationship between general motivational tendencies (i.e., behavioural inhibition system/behavioural activation system sensitivity) and idiographic social goals (i.e., approach and avoidance goals). It is argued that positive affect deficits associated with social interaction anxiety (e.g., Hughes et al., 2006; Kashdan, 2002) may be particularly relevant to the prediction of social goals, contributing to a range of social and emotional difficulties. Evaluating this model will help to clarify the nature of social goals in social interaction anxiety and the role that affect plays in goal selection. Building on the findings of the first two studies, the third study investigates whether a technique designed to increase positive affect leads to beneficial changes in social motivation in a socially anxious sample. These findings carry implications for models of approach and avoidance and for the treatment of social anxiety disorder.

1.1 A Note on Terminology

This dissertation uses a number of closely related terms that are relevant to motivation and affect. As the literature on this topic refers to the same basic constructs using a variety of terms, with a lack of consistency in how these terms are used and a lack of consensus regarding their precise definitions, a brief section on terminology is in order. In this manuscript, temperament refers to aspects of the character or personality that are regarded as innate and biologically based rather than learned (Colman, 2009; Kagan, 2010). Two closely related, and somewhat overlapping, constructs are motivational dispositions and trait affect, both of which are seen as biologically based response tendencies (e.g., Gray, 1982, 1990; Whittle, Allen,

Lubman, & Yücel, 2006). Motivational dispositions refer to the tendency for actions to be driven by particular needs or desires (Colman, 2009) whereas trait affect refers to the tendency to experience particular emotions or feelings. The terms positive and negative affectivity are used to refer to similar affective constructs in the emotion literature.

In addition to these biologically based response tendencies, this manuscript discusses a number of variables that are influenced by environmental factors. These variables include personality traits, referring to the particular emotional, behavioural, and attitudinal response patterns that characterize an individual. They also include state affect which refers to temporary subjective emotions that are experienced at a particular moment in time. Some researchers also examine affect experienced over a set period of time, such as daily affect (i.e., affect experienced over the course of a day). Lastly, goals refer to the specific objectives that an individual is attempting or planning to achieve. This dissertation will focus primarily on goals for social relationships and goals specific to a particular social encounter.

The exact pattern of relationships between these constructs is not clearly specified in the literature on motivation and affect. However, some researchers have proposed hierarchical relationships between some of the variables, as will be discussed below (e.g., Elliot, 2006; Gable, 2006). A visual representation of the presumed relationships between these variables is presented in Figure 1. This figure progresses from more general, innate tendencies to more specific and contextual responses and is included to help clarify the way that these variables are being conceptualized in this manuscript.

1.2 Approach and Avoidance Processes in Self-Regulation

Social motives and goals can vary greatly in their focus. Theories of self-regulation focus on understanding these motives and goals, examining how individuals regulate their behaviour in

the pursuit of specific objectives. The distinction between approach and avoidance is one of the oldest concepts in psychology, with a number of research groups arguing that approach and avoidance reflect fundamental human motives embodied in separate motivational systems (see Elliot, 2006; Elliot & Covington, 2001, for reviews). Approach motives and goals focus on attaining or maintaining desirable outcomes, whereas avoidance motives and goals focus on escaping or staying away from undesirable outcomes (Dickson, 2006). Empirical research supports the presence of distinct approach and avoidance temperament dimensions, with appetitive constructs such as behavioural activation, positive emotionality, extraversion, approach coping, and positive temperament loading onto one factor and aversive constructs such as behavioural inhibition, negative emotionality, neuroticism, avoidance coping, and negative temperament loading onto another (Elliot & Thrash, 2002; Gable, Reis, & Elliot, 2003). These constructs are semi-independent; approach does not imply an absence of avoidance and vice versa (Gable & Strachman, 2008). A number of contemporary theoretical models of approach and avoidance have been proposed. These models provide a framework for understanding how approach and avoidance motives and goals come to affect emotions and psychological well-being.

      1.2.1 Models of approach and avoidance. Although theories of self-regulation differ in the specific language that they use, several models have focused on approach and avoidance processes. The approach system has been variously referred to as the behavioural activation system, behavioural approach system, and behavioural facilitation system, whereas the avoidance system has been referred to as the behavioural inhibition system and the behavioural withdrawal system (Carver, 2006). Approach and avoidance tendencies have also been described in terms of promotion (of positive outcomes) versus prevention (of negative outcomes; Higgins,

1997) and as efforts to reduce self-discrepancies (Higgins, 1987). Four prominent models of approach and avoidance have emerged: Gray's (1987a, 1990) reinforcement sensitivity theory, Carver and Sheier's (1990) cybernetic control theory, Higgins' (1987) self-discrepancy theory, and Higgins' (1997) regulatory focus theory. These models have been applied to social anxiety (to some extent). However, none of these models account for the full range of approach and avoidance processes relevant to social interaction anxiety. Each model will be discussed in turn.

1.2.1.1 Reinforcement sensitivity theory. Perhaps one of the most influential theories of approach and avoidance motivation in recent decades, Gray's (1987a, 1990) reinforcement sensitivity theory helped to bring approach and avoidance back into mainstream psychology. This theory posits the existence of three distinct motivational systems: the behavioural activation system (BAS), the behavioural inhibition system (BIS), and the fight/flight system (FFS). The BAS, activated by signals of reward and non-punishment, elicits approach behaviour and emotions of hope, elation, and relief, whereas the BIS, activated by signals of conditioned punishment and non-reward, novelty, and innate fear stimuli, regulates avoidance behaviour and elicits behavioural inhibition, increased arousal and vigilance, selective attention, and anxiety. The FFS, activated by unconditioned punishment and non-reward, elicits aggression or escape (e.g., Gray, 1987a, 1990).

Later amendments to this theory saw the FFS, now termed the fight/flight/freeze system (FFFS), activated by immediate present threat and eliciting freezing, defensive avoidance, and escape, whereas the BIS, now activated by conflict between concurrent goals (e.g., the desire to both meet new people and avoid rejection), inhibits ongoing behaviour and resolves goal conflict (favouring avoidance) by increasing arousal and attention to new goal-relevant information and increasing the weight given to affectively negative information (Gray & McNaughton, 2000; see

Smillie, Pickering, & Jackson, 2006, for a review). Although this revision gives the FFFS a somewhat greater role in self-regulation, it does not fundamentally change the role of the BIS, as BIS mediated reactions to punishment have always required the presence of conflicting stimuli (i.e., behaviour must be motivated or occurring to be inhibited; Smillie et al., 2006). The BIS continues to mediate avoidance except in specific situations that activate only the FFFS, with most environments producing goal conflict through a mixture of stimulus valences (Smillie et al., 2006).

Kimbrel (2008) has developed a model outlining distal and proximal causes of generalized social phobia (i.e., generalized social anxiety disorder) that is based on reinforcement sensitivity theory. According to this model, BIS-FFFS reactivity is a major factor in initial vulnerability to social phobia. BAS sensitivity (i.e., sensitivity of the BAS to cues of reward; an index of dispositional approach motivation) serves as a moderator variable, with low BAS sensitivity increasing risk by facilitating FFFS activity and high BAS sensitivity serving as a protective factor that antagonizes FFFS activity. Current levels of BIS and FFFS sensitivity (i.e., sensitivity of the BIS/FFFS to cues of conflict and punishment; indices of dispositional avoidance motivation) interact with situational factors, stressors, and BAS sensitivity to produce varying levels of state (i.e., momentary) anxiety and avoidance, combining with information processing biases resulting from BIS and FFFS hyperactivity to increase social anxiety (Kimbrel, 2008). This model suggests that general motivational tendencies (i.e., high avoidance motivation coupled with low approach motivation) predict subsequent symptoms of social anxiety. Consistent with this, there is empirical support for a relationship between motivational tendencies and anxiety experienced during a social speech task (Kimbrel, Nelson-Gray, &

Mitchell, 2012). However, it is important to note that this model does not go beyond the symptoms of social anxiety to predict social goals, behaviour, or relevant social outcomes.

   1.2.1.2 Cybernetic control theory. Carver and Scheier (1982) have proposed a slightly more complex model of self-regulation, using cybernetic control theory as a general approach to understanding self-regulating systems. According to this model, self-regulation occurs when individuals sense their present condition, compare their condition to a reference value (i.e., a goal) and, if necessary, engage in behaviour to bring their present condition in line with this reference value (Carver & Scheier, 1982). Human behaviour is thought to be motivated by a combination of approach and avoidance goals (Carver & Scheier, 1998). Discrepancy reducing loops encourage approach by honing in on specific desirable targets while discrepancy enlarging loops encourage avoidance, distancing the individual from undesirable outcomes (Carver, 2006). The approach system functions to obtain desired outcomes and encourage the abandonment of futile goals, whereas the avoidance system functions to protect the individual from threats and prepares them to turn to new activities when a threat has passed (Carver, 2001).

   Carver and Scheier (1986) have applied their model of self-regulation specifically to social anxiety. According to their model, anxiety experienced in the context of a social interaction can interrupt goal pursuit and prompt an assessment of the probability of successfully accomplishing the active goal. Socially anxious individuals may develop unfavourable expectancies in social situations in response to doubts about their ability to create and maintain a desired self-presentation coupled with enhanced self-focus. These low expectancies may, in turn, lead to disengagement from the interaction, with the individual switching from approach behaviour to avoidance behaviour. If the individual is unable to physically leave the situation, they may mentally disengage, decreasing effort and attention and increasing negative affect. This process

may occur repeatedly during a given encounter and may also occur while anticipating social interactions, potentially leading to the avoidance of social situations (Carver & Scheier, 1986). In this model, negative emotions and cognitions (e.g., low social self-efficacy) directly interfere with the pursuit of approach goals and promote subtle or total avoidance. This model helps to account for social behaviour and emotional responses in social anxiety. However, it stops short of discussing general motivational tendencies (e.g., dispositional approach and avoidance motives) and the specific goals that socially anxious individuals are likely to pursue.

1.2.1.3 Self-discrepancy theory and regulatory focus theory. Higgins (1987, 1997) has proposed two additional theories of self-regulation that center around approach and avoidance. Higgins' (1987) self-discrepancy theory posits the existence of three basic domains of the self: the actual self (i.e., the self-concept), the ideal self (i.e., ones' hopes, aspirations, and wishes), and the ought self (i.e., a representation of duties, obligations, or responsibilities). The ideal and ought selves act as self-guides, influencing the individuals' behavioural choices. Discrepancies between the actual self and these self-guides are associated with specific emotional and motivational problems (Higgins, 1987). Higgins has linked the ideal self to an approach orientation (i.e., individuals work to approach their ideal selves) and the ought self to an avoidance orientation (i.e., individuals work to avoid punishment caused by failing to meet expectations; Higgins, Roney, Crowe, & Hymes, 1994; Roney, Higgins, & Shah, 1995).

Higgins' (1997) regulatory focus theory also has clear ties to approach and avoidance (Crowe & Higgins, 1997). According to this theory, a promotion focus orients individuals towards obtaining positive outcomes (e.g., advancement and growth, nurturance, attainment of ideals), with complementary efforts to avoid the absence of positive outcomes. A prevention focus, on the other hand, orients individuals towards avoiding negative outcomes (e.g.,

protection from threats, security, safety, fulfillment of duties; Molden, Lee, & Higgins, 2008).

Higgins' theories are complementary, as ideal self-regulation is thought to involve a promotion focus, whereas ought self-regulation involves a prevention focus (Higgins, 1997). Consistent with this, a promotion focus has been linked to approach tendencies and a prevention focus has been linked to avoidance tendencies (Higgins, 1997). Importantly, approach and avoidance goals can serve either promotion or prevention purposes, depending on the final objective of goal pursuit (e.g., trying to make someone laugh in order to avoid rejection; Higgins, 1997; Molden et al., 2008). This suggests that it is important to consider both the form that a goal takes (i.e., approach vs. avoidance) and the underlying motive (i.e., promotion vs. prevention) when evaluating the relationship between approach and avoidance goals and related constructs.

Higgins' regulatory focus theory carries a number of implications for behaviour, with regulatory focus affecting judgment, strategies used in goal pursuit, sensitivity to evaluation, decision making, and goal directed behaviour (Crowe & Higgins, 1997; Molden et al., 2008). Regulatory focus, either chronic or induced, affects reactions to outcomes and feedback (Idson, Liberman, & Higgins, 2000), latency to action in response to a goal (Freitas, Liberman, Salovey, & Higgins, 2002), preferences for stability (prevention) and change (promotion; Liberman, Idson, Camacho, & Higgins, 1999), and may affect behaviour in relationships (Molden et al., 2008). Regulatory focus may also affect goal commitment and attainment, with higher levels of motivation and performance when the strategy and focus of goal attainment are in line with the predominant regulatory focus (Higgins, 1997; Spiegel, Grant-Pillow, & Higgins, 2004).

Research has linked social anxiety to higher levels of actual-ought discrepancy (Strauman, 1989; Strauman & Higgins, 1988). Consistent with this, the activation of actual-ought discrepancies increases agitation in socially phobic patients (Strauman, 1989). This demonstrates

a connection between social anxiety and the avoidance processes outlined by self-discrepancy theory. However, this appears to be the only research investigating social anxiety in the context of either self-discrepancy theory or regulatory focus theory. Although these two theories may provide insight into the nature of approach and avoidance processes in social interaction anxiety, empirical and theoretical links to relevant goals, behaviours, and social and emotional outcomes have yet to be established.

1.3 Separable vs. Joint Subsystems

These self-regulatory models suggest that approach and avoidance processes are relevant to social anxiety. In order to fully understand these processes, it is important to consider whether they operate independently or in concert to affect relevant outcomes. The separable subsystems hypothesis argues that, at any given moment, either the BIS or the BAS is in control of affect and behaviour, with conflicting inputs resolved through dominance by one system (Corr, 2001). Approach and avoidance are thought to be independent at each level of the motivational hierarchy (see below), with different processes mediating the outcomes associated with approach and avoidance motivation (Gable & Impett, 2012). However, mismatches can occur such that approach motives energize avoidance goals or avoidance motives energize approach goals (Elliot & Niesta, 2009; see also Higgins, 1997; Molden et al., 2008). Consistent with the separable subsystems hypothesis, measures of BIS and BAS sensitivity are generally found to be independent in clinical and non-clinical samples (e.g., Campbell-Sills, Liverant, & Brown, 2004; Gable, Reis, & Elliot, 2000; cf. Muris, Meesters, de Kanter, & Timmerman, 2005).

In contrast, the joint subsystems hypothesis assumes functional interdependence between the approach and avoidance systems, with the BIS and BAS influencing both approach and avoidance behaviour and the precise pattern of effects depending on the relative strengths of

appetitive and aversive stimuli and motivation (Corr, 2001). Under this hypothesis, high BIS and low BAS sensitivity promote avoidance and negative emotions, whereas high BAS and low BIS sensitivity promote approach and positive emotions (Corr, 2001). Each system is thought to have inhibitory effects on the other, with the link from the BIS to the BAS stronger than that from the BAS to the BIS, ultimately resulting in greater inhibition of the BAS (i.e., greater behavioural inhibition or avoidance; Corr, 2001). Corr (2002) has provided support for the joint subsystems hypothesis in two experimental studies, finding that anxiety (i.e., BIS sensitivity) and impulsivity (i.e., BAS sensitivity) interact in determining reactions to punishment. A similar pattern of joint influence may be evident in reactions to perceived social threat in the context of social anxiety.

Corr (2001) notes that the separable and joint subsystems hypotheses are not mutually exclusive and that "sometimes, results conform to the *separable subsystems* hypothesis (especially for aversive stimuli), at other times, to the *joint subsystems hypothesis*" (p. 346). Consistent with this, it has been argued that approach and avoidance motives reflect independent motivational systems that can either dominate or co-occur (Nikitin & Freund, 2008). The separable subsystems hypothesis is thought to hold when individuals are extremely high in either BIS or BAS sensitivity, when very strong appetitive or aversive stimuli are present, and when situations do not contain mixed reward and punishment cues or require shifting between these cues (Corr, 2002). However, given a standard, non-zero background level of BIS and BAS activation, the two systems likely exert functionally interdependent effects (Corr, 2002). Joint activation of the approach and avoidance systems may be particularly likely to occur in social situations, as most social situations involve a mixture of appetitive and aversive stimuli (Corr, 2002) and are characterized by approach-avoidance conflicts (Kimbrel, 2008).

1.4 Hierarchical Models of Self-Regulation

It is also worth considering whether approach and avoidance processes are best understood at the level of temperaments, motives, goals, or behaviours. While temperaments and motives energize and orient individuals towards specific outcomes, goals provide precise guidelines for behaviour in line with these motives, whereas behaviour refers to the specific actions taken in the pursuit of these goals (Elliot, 2006; Elliot & Niesta, 2009; Holtforth, 2008). As general motivational dispositions are thought to be too abstract to directly regulate behaviour, goals can be seen as central organizers of affect, cognition, and behaviour, functioning as strategic midlevel forms of self-regulation in the service of these higher order motivational dispositions (Elliot, Sheldon, & Church, 1997). Goals may also be more malleable and susceptible to change than motives and temperaments, making them a promising target for psychotherapy research and practice (Elliot & Niesta, 2009; Holtforth, 2008). However, researchers contend that it is also important to consider the motives driving these goals, as different motives can drive the same goal just as different goals can be driven by the same motive (Elliot & Niesta, 2009).

Hierarchical models reflect the functional relationships between these motivational constructs. These models can also accommodate additional higher-order variables that influence goal-adoption, such as perceptions of competence (Elliot & Niesta, 2009) and social interaction anxiety (as will be argued below). All of the models of approach and avoidance described above can be seen as hierarchical models, with more abstract, higher level, distal motivational processes influencing more proximal, concrete goals and behaviours. For example, Gray (1987a, 1990) argues that individual differences in BIS/BAS sensitivity give rise to differences in personality which are, arguably, more proximal to actual behaviour. Gray and McNaughton

12

(2000) also discuss goals and how goal conflict is addressed by the basic motivational systems. Carver and Scheier's (1982) cybernetic control theory specifically postulates hierarchical control systems at different levels of abstraction, with superordinate goals specifying the reference values for subordinate goals. Higgins' models (1987, 1997) also contain an implicit hierarchical structure, proceeding from abstract self-guides and regulatory focus to concrete behavioural goals. Indeed, hierarchical models linking abstract motives to specific goals and behaviours appear to be fairly commonplace in the self-regulation literature.

A number of researchers have specifically set out to develop hierarchical models of approach and avoidance that may help to predict particular outcomes. Working primarily in the achievement domain, Elliot has developed a model that includes motives and other factors such as competence expectancies as distal predictors of specific goals which, in turn, predict a variety of outcomes (Elliot, 2006; Elliot & Church, 1997). Consistent with this, empirical research has demonstrated links between BAS sensitivity and decreased avoidance (relative to approach) goals and between BIS sensitivity and increased avoidance (relative to approach) goals, supporting a relationship between general motivational tendencies and idiographic goals (Elliot & Thrash, 2002). Elliot and his colleagues have also investigated a number of distal predictors of approach and avoidance goals in addition to BIS and BAS sensitivity. Fear of failure and neuroticism have been linked to avoidance goals (Elliot & Sheldon, 1997; Elliot et al., 1997) and low self-esteem has been shown to mediate the relationship between approach/avoidance temperament and avoidance goals (Heimpel, Elliot, & Wood, 2006). Avoidance goals, in turn, have been linked to lower perceived competence, lower perceived progress, and lower subjective well-being (Elliot & Sheldon, 1997; Elliot et al., 1997).

Gable (2006) has developed a hierarchical model that applies specifically to social encounters. Similar to Elliot's (2006) model, distal temperamental (i.e., BIS/BAS sensitivity) and motivational factors (e.g., fear of rejection, need for affiliation) are thought to affect proximal goals (i.e., social approach and avoidance goals) which, in turn, affect social and personal outcomes (e.g., positive and negative social experiences, subjective well-being; Elliot, Gable, & Mapes, 2006). In Gable's (2006) model, both motives and goals have independent effects on these outcomes. Social incentives (e.g., opportunities for affiliation) are thought to promote approach goals, whereas social threats (e.g., rejection, conflict) promote avoidance (Gable & Strachman, 2008). It may be possible to extend this model to include social interaction anxiety as a midlevel predictor of social goals. This may help us to identify predictors of social goal selection and interventions that will reduce problematic avoidance tendencies in socially anxious individuals.

1.5 Approach, Avoidance, and Social and Emotional Outcomes

Hierarchical models such as the one outlined by Gable (2006) may help to account for the social and emotional difficulties associated with social interaction anxiety. Social approach motives and goals have been linked to a range of positive social outcomes including more frequent positive social events, decreased loneliness, greater satisfaction with social bonds, positive social attitudes, less frequent negative social events, and greater overall success in the social and employment domains (Elliot et al., 2006; Gable, 2006; Nikitin & Freund, 2008), Social avoidance motives and goals, on the other hand, have been linked to increased reactivity to negative social events, loneliness, negative social attitudes, relationship insecurity, social worry, decreased relationship satisfaction, more frequent negative social events, anxious solitary behaviour, lower perceived popularity, and decreased social and employment success (Elliot et

al., 2006; Gable, 2006; Nikitin & Freund, 2008; Nurmi, Toivonen, Salmelo-Aro, & Eronen, 1996; A. M. Ryan & Shim, 2006, 2008). Self-protective behaviour (e.g., the avoidance of self-disclosure) has also been linked to decreased liking and greater discomfort on the part of conversational partners, supporting a link between avoidance behaviour and negative interpersonal reactions (Meleshko & Alden, 1993). Compounding matters, the interpersonal problems associated with pursuing social avoidance goals may predict low satisfaction of approach goals (Holtforth, Bents, Mauler, & Grawe, 2006).

Approach and avoidance tendencies may also help to account for the emotional difficulties associated with social anxiety. Goal progress and attainment have been linked to both general and specific emotional responses, with a number of researchers arguing that there is a connection between approach motives and goals and positive emotions, including daily positive affect (Updegraff, Gable, & Taylor, 2004), positive responses to reward cues (Carver & White, 1994), and hope, elation, and relief (Gray, 1990). Avoidance motives and goals, on the other hand, have been linked to daily negative affect (Updegraff et al., 2004), negative responses to cues of punishment (Carver & White, 1994), and anxiety (Gray, 1987b, 1990). Although Gable's original model did not address the specific emotional responses likely to occur during the process of goal pursuit, later iterations of this model predicted that progress towards social approach goals would be tied to emotions ranging from joy to disappointment, whereas avoidance goal progress would be associated with emotions ranging from relief to anxiety (Gable & Berkman, 2008).

These predictions are consistent with other major self-regulation theories and with existing empirical evidence. Higgins has linked both actual-ideal discrepancies and a promotion focus to emotional responses ranging from elation to dejection, with the presence of positive

outcomes leading to elation (Higgins, 1987; Molden et al., 2008) and the absence of positive outcomes leading to sadness, dejection, dissatisfaction, and frustration (Higgins, 1987; Higgins, Klein, & Strauman, 1985; Strauman & Higgins, 1987, 1988). Actual-ought discrepancies and a prevention focus, on the other hand, have been linked to emotional responses ranging from quiescence to agitation, with the absence of negative outcomes leading to relaxation and quiescence (Higgins, 1987; Molden et al., 2008) and the presence of negative outcomes leading to nervousness, fear, restlessness, agitation, and resentment (Higgins, 1987; Higgins et al., 1985; Strauman & Higgins, 1987, 1988). The strength of an emotional response is thought to be tied to the strength and accessibility of the active self-guides, discrepancies, and regulatory focus (Higgins, 1987; Higgins, Shah, & Friedman, 1997).

Carver and Scheier (1998, 2008) have drawn similar connections between approach, avoidance, and emotional responses. According to their model, affect results from comparing current goal progress to a given reference value, with positive emotions resulting when progress exceeds the reference rate and negative emotions resulting when progress is below the reference rate (Carver, 2001; Carver & Scheier, 1998, 2008). Affect then serves as a signal to adjust behavioural output to bring the rate of progress in line with this reference rate (Carver, 2006). Positive emotions encourage "coasting", providing the opportunity to reinvest resources into new goals and opportunities, whereas negative emotions call for increased investment of resources and effort into the focal goal (at least until it is proven to be futile; Carver, 2004a). Discrepancy reducing loops (i.e., approach) are thought to elicit emotions running from depression to elation while discrepancy enhancing loops (i.e., avoidance) elicit emotions running from anxiety to relief/contentment (Carver, 2001; Carver & Scheier, 1998, 2008). These emotions, in turn, are

thought to affect subsequent expectancies, sensed progress, memory, and the salience of information (Carver & Scheier, 1990).

The consistency of these predictions and findings suggests that dejection-elation and agitation-quiescence reflect the primary emotional responses associated with the pursuit and attainment (or non-attainment) of approach and avoidance goals (respectively). This view is shared by a number of additional researchers and theorists (e.g., Roseman, 2008) and suggests that high avoidance and low approach may contribute to anxious and dejected affect in socially anxious individuals. These findings also suggest that approach and avoidance tendencies contribute to the low positive affect (PA) and high negative affect (NA) that has been observed in social interaction anxiety (e.g., Hughes et al., 2006; Kashdan, 2004),

These connections between approach and avoidance tendencies and negative social and emotional outcomes suggest that it is important to understand approach and avoidance processes in social interaction anxiety. Avoidance processes appear to be particularly problematic, contributing to a range of adverse interpersonal and affective outcomes. A thorough examination of the relationships between these motivational constructs may point to new targets for intervention that will help to create a more optimal balance of approach and avoidance. This may ultimately help to improve social and emotional functioning in socially anxious individuals.

1.6 Developing a Model of Approach and Avoidance in Social Interaction Anxiety

Hierarchical models such as the one outlined by Gable (2006) are intriguing and draw clear connections between approach and avoidance motives (and other distal predictors), goals, and relevant social and emotional outcomes. However, although Gable notes that her model can be applied to general social motives or motives within a specific relationship (Gable & Berkman, 2008), this model does not necessarily address motivation and behaviour within a specific social

encounter. In addition, research has yet to explore whether hierarchical models such as Gable's (2006) may help in understanding approach and avoidance processes in social anxiety. As suggested above, it may be possible to extend these hierarchical models to include social interaction anxiety as a midlevel predictor of social goals. The following sections will consider the relationship between social anxiety and approach and avoidance motives, goals, and behaviours and whether affect may play a role in the process of social goal selection.

   1.6.1 Approach, avoidance, and social anxiety. As mentioned above, approach and avoidance processes have been linked to social anxiety. Social anxiety is associated with high BIS sensitivity and low BAS sensitivity (Coplan, Wilson, Frohlick, & Zelenski, 2006; cf. Kashdan & Roberts, 2006; Levinson, Rodebaugh, & Frye, 2011; Movius & Allen, 2005), with longitudinal studies suggesting that behavioural inhibition (i.e., fearful avoidance) confers a specific risk for social anxiety disorder in childhood and adolescence (see Hirshfeld-Becker et al., 2008, for a review). Consistent with this, high BIS sensitivity is more strongly related to social anxiety than to other forms of anxiety and depression (Sportel, Nauta, de Hullu, de Jong, & Hartman, 2011). Low BAS sensitivity, on the other hand, appears to be largely specific to social interaction anxiety and was unrelated to social performance anxiety (e.g., speech anxiety) in three large analogue samples (Kimbrel et al., 2010). High avoidance and low approach motivation are also found in social interaction anxiety when researchers focus specifically on social motivation (i.e., rejection sensitivity and affiliative tendencies; Nikitin & Freund, 2010).

   Socially anxious individuals also appear to be motivated by different goals during social interactions. Whereas non-socially anxious individuals are driven primarily by the desire to obtain positive social outcomes, socially anxious individuals display greater concern with avoiding disapproval and are more likely to adopt self-protective strategies (Meleshko & Alden,

1993). In addition, individuals with speech anxiety (a specific form of social anxiety) identify more specific goals for prevention behaviour than for promotion behaviour (i.e., specific plans for detectable actions rather than global desires; Rodebaugh, 2007), suggesting more pronounced and concrete concerns with avoidance. Socially anxious people also display maladaptive goal setting strategies that may interfere with successful goal attainment, settling on goals quickly and then, doubting their ability to achieve these goals, activating and deliberating competing goals (e.g., subtle or total avoidance). This may increase their anxiety and interfere with spontaneous behaviour, making them come across as detached or disinterested (Hiemisch, Ehlers, & Westermann, 2002).

Avoidance behaviour, in turn, is argued to be an important maintaining factor in social anxiety (Rinck et al., 2010) that prevents the disconfirmation of negative beliefs (D. M. Clark & Wells, 1995; Taylor & Alden, 2010). Social interaction anxiety correlates with measures of social avoidance (Leary, Atherton, Hill, & Hur, 1986) and has been linked to decreased prosocial behaviour and increased socially helpless behaviour in adolescents, particularly in the context of social exclusion (Gazelle & Rudolph, 2004). In addition, using a virtual reality paradigm, Rinck et al. (2010) found that socially anxious participants were slower to approach and kept a larger distance from others, showing unintentional avoidance in social situations. Behavioural avoidance partially mediates the relationship between social anxiety and depressive symptoms, possibly due to interpersonal consequences such as loneliness and the loss of social support (Moitra, Herbert, & Forman, 2008). Inhibited social behaviour may also have a negative impact on school and work performance, social self-esteem, and romantic and peer relationships (Asendorpf, Denissen, & van Aken, 2008). This research suggests that it is particularly important to understand and change avoidance tendencies in social interaction anxiety.

1.6.2 Affect as a proximal predictor of social goals. This research establishes links between approach and avoidance motives, social interaction anxiety, and social approach and avoidance goals and behaviours. Affect may also play an important role in the process of goal selection. The following sections will consider affective tendencies in social interaction anxiety and the role that affect, particularly PA, may play in social goal selection.

1.6.2.1 Social interaction anxiety and affect. Social anxiety is associated with low levels of positive emotion and experiences in addition to general distress, non-specific anxiety, and anxious arousal (Kashdan, 2004). As a result, social anxiety does not follow the affective profile outlined in the tri-partite model of anxiety and depression (L. A. Clark & Watson, 1991). Briefly, this model argues that, while anxiety and depression are both characterized by high levels of NA, physiological hyperarousal is specific to anxiety whereas low PA is specific to depression (L. A. Clark & Watson, 1991). Social anxiety correlates with trait measures of both PA and NA in children (Chorpita, Plummer, & Moffitt, 2000; Hughes & Kendall, 2009) and adults (T. A. Brown, Chorpita, & Barlow, 1998; Kashdan & Roberts, 2006; Kashdan & Steger, 2006),[2] with several studies finding that positive emotionality (i.e., PA) is a stronger (inverse) predictor of social phobia than negative emotionality (i.e., NA; Chorpita et al., 2000; Hughes & Kendall, 2009; Watson, Clark, & Carey, 1988). PA deficits have been identified in both clinical and non-clinical samples, even after controlling for general distress and symptoms of depression and anxiety (Alden et al., 2008; T. A. Brown et al., 1998; Chorpita et al., 2000; Hughes et al., 2006; Hughes & Kendall, 2009; Kashdan, 2004). These PA deficits appear to be particularly pronounced in social interaction anxiety. Hughes et al. (2006) found that a measure of anhedonia

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[2] Research in adolescents suggests that this pattern may be specific to more severe forms of social phobia. Although social anxiety was associated with higher NA and lower PA in response to a social threat (i.e., a speech task), PA deficits proved to be specific to social phobia and were not observed in sub-clinical adolescents with elevated social anxiety (Anderson, Veed, Inderbitzen-Nolan, & Hansen, 2010).

(i.e., PA deficits) predicted social interaction anxiety after controlling for general distress but did not predict social performance anxiety. Similarly, Kashdan (2002) found that, although social interaction anxiety was uniquely (inversely) associated with positive subjective experiences, curiosity, and appetitive motivation after controlling for social observation anxiety and neuroticism, social observation anxiety was not associated with these variables after controlling for social interaction anxiety. This research suggests that both PA and NA are relevant to social interaction anxiety, making it somewhat unique among the anxiety disorders.

Social anxiety has also been linked to affect experienced over the course of a day. In a 21-day experience sampling study by Kashdan and Steger (2006), greater dispositional social interaction anxiety was associated with less PA and fewer positive events in daily life after controlling for trait NA. Similarly, a 14-day ecological momentary assessment study conducted by Kashdan and Collins (2010) found that social anxiety was associated with less time spent feeling happy and relaxed and more time spent feeling angry throughout the day, establishing a connection between trait-level social anxiety and PA deficits in daily life. Social anxiety was also linked to decreased daily PA and increased daily NA in an experience sampling study conducted by Brown, Silvia, Myin-Germeys, and Kwapil (2007). In addition, social interaction anxiety has been shown to predict lower state-level PA and higher NA in response to a social interaction with an unfamiliar peer, although the relationship to post-interaction PA became non-significant after controlling for trait PA and NA, curiosity, and BIS and BAS sensitivity (Kashdan & Roberts, 2006). Lastly, social anxiety has been linked to lower activated and deactivated PA and social self-efficacy and higher activated NA and state anxiety in response to a social interaction with an unfamiliar same-sex peer, particularly under conditions of social threat and self-focus (Kashdan & Roberts, 2004).

Consistent with these findings, a meta-analytic study by Kashdan (2007) found a significant relationship between social anxiety and diminished PA across 19 studies, with a 95% confidence interval reaching from $r = -.31$ to $-.40$. This moderate effect continued to be significant in studies that controlled for concurrent depression (Kashdan, 2007). The Social Interaction Anxiety Scale (Mattick & Clarke, 1998) showed a stronger inverse relationship with PA relative to most other measures of social anxiety, supporting the relevance of PA deficits to social interaction anxiety. There were no significant differences between the effect sizes for trait-level PA and state or daily PA (Kashdan, 2007). This meta-analysis provides clear support for the presence of PA deficits in social anxiety.

Overall, this research indicates that social anxiety is associated with infrequent, low intensity, and short-lived positive experiences that may restrict quality of life (see Kashdan, Weeks, & Savostyanova, 2011, for a review). Some have argued that the PA deficits observed in social anxiety are consistent with the interpersonal nature of PA (L. A. Clark, Watson, & Mineka, 1994), with excessive social anxiety and social avoidance limiting rewards and positive affective experiences and, over time, blunting reward sensitivities (Kashdan, 2004). PA deficits may also emerge because socially anxious individuals devote extensive personal resources to regulating negative emotions, disrupting the experience of positive outcomes and the ability to take advantage of environmental rewards (Kashdan, 2002, 2007; Kashdan & Steger, 2006; Kashdan & Weeks, 2010; Kashdan et al., 2011). Social anxiety is also associated with cognitive biases that may decrease the ability to focus on and maximally benefit from positive experiences (see Kashdan & Weeks, 2010, for a review), including negative interpretations of positive social events and the tendency to doubt the genuineness of positive social reactions (Alden et al., 2008). Although it is important to note that PA deficits are not found in all studies (e.g., Kimbrel et al.,

2010), the affective profile of social interaction anxiety is fairly well established. This affective profile may, in turn, affect social goal selection.

1.6.2.2 The role of affect in the selection of social goals. A number of researchers have argued that, in addition to being a potential consequence of goal success or failure, emotions are central to the process of goal pursuit, functioning to direct, energize, and regulate goal directed behaviour and related cognitive processes (Bagozzi, Baumgartner, & Pieters, 1998; Bagozzi, Baumgartner, Pieters, & Zeelenberg, 2000; Bjornebekk, 2008). Affective dispositions may be a decisive factor in an individual's choice of actions (see Bjornebekk, 2008, for a review), with specific emotions prompting relevant behavioural responses (see Carver, Sutton, & Scheier, 2000, for a review). Bjornebekk (2008) notes that a central hypothesis of classic motivational theory is that affect drives motivated behaviour, with approach and avoidance temperaments as antecedents of and the energizing force behind positive and negative affectivity which, in turn, influence goals. Under this perspective, emotions act as mediators between general motivational tendencies and approach and avoidance behaviour, with positive emotions increasing behaviour oriented towards approaching/attaining rewards and negative emotions increasing behaviour oriented towards avoiding or reducing punishment (Bjornebekk, 2008; Cunningham, Steinberg, & Grev, 1980).

Consistent with this notion, Watson, Wiese, Vaidya, and Tellegen (1999) argued that fluctuations in PA and NA may reflect the operation of the BAS and BIS, mediating goal directed approach and withdrawal behaviour, with NA facilitating avoidance and PA both facilitating and rewarding approach. Russell and Mehrabian (1978) made a similar argument, viewing emotions as mediators between environmental variables and approach and avoidance

behaviour. When strong, emotions may take precedence over motives of comparable or lesser strength, determining behavioural outcomes (Roseman, 2008).

Emotions may be particularly important during goal selection, signalling goal desirability (Bagozzi et al., 2000) and increasing awareness of the possibility of success and failure (Bjornebekk, 2008). General affective states have been shown to influence task and goal choices and self-perceptions relevant to goal pursuit (e.g., self-efficacy; Saavedra & Earley, 1991). Affect may also influence cognitive processes relevant to goal selection. PA has been shown to promote cognitive flexibility and decrease perseveration (Ashby, Isen, & Turken, 1999; Dreisbach & Goschke, 2004) and is associated with higher expectations of success, higher recall/estimates of past successes, and more favourable global self-evaluations. NA, on the other hand, is associated with lower expectations, lower estimates of previous success, more negative self-assessments, and maladaptive goal setting strategies (i.e., setting minimal goals that exceed expectations for success; Wright & Mischel, 1982). This suggests that both PA and NA are relevant to goal selection. Consistent with this, Bjornebekk (2007, as cited by Bjornebekk, 2009) found that PA was positively associated with the adoption of approach goals whereas NA was related to the adoption of avoidance goals.

Affect may be particularly relevant to the selection of social goals, with some researchers suggesting that positive mood is associated with social, expansive, approach motivation whereas negative mood is associated with avoidant, egocentric motivation (Cunningham, 1988a). Both state and trait measures of PA have been linked to social activity (L. A. Clark & Watson, 1988; Watson, 1988; Watson, Clark, McIntyre, & Hamaker, 1992), even after controlling for extraversion (Burger & Caldwell, 2000). Similarly, whereas PA is positively related to social contact, both NA and self-consciousness have been inversely linked to social contact (L. H.

Brown et al., 2007). Happiness and PA have also been linked to sociability, with PA showing a stronger relationship to sociability than NA (Costa & McCrae, 1980). In addition, PA has been linked to the number of approach goals listed for a social speech task (Rodebaugh & Shumaker, 2012), demonstrating a direct link between affect and social goals. Interestingly, PA was also associated with ratings of confidence in attaining avoidance goals for a social speech task (Rodebaugh & Shumaker, 2012). This suggests that PA may predict aspects of social avoidance.

As most of these studies were correlational in nature, it is difficult to determine whether affect predicts sociability or vice versa. Some researchers have suggested that PA and social activity are reciprocally related, with social activity, at least in part, a function of PA (Watson et al., 1992). Supporting the notion that PA promotes social activity, a number of studies have found that PA is associated with greater interest in social and prosocial activities (Cunningham, 1988b; Rossi & Rossi, 1977). In addition, the induction of PA has been shown to increase helping behaviour (Cunningham et al., 1980; Shaffer & Smith, 1985) and lead to more intimate heterosexual communication (Cunningham, 1988a) relative to neutral and negative mood induction. This supports the idea that PA contributes to sociability.[3]

Interestingly, NA was unrelated to sociability in a number of these studies (L. A. Clark & Watson, 1988; Watson, 1988; Watson et al., 1992). Consistent with this, Rodebaugh and Shumaker (2012) found that, while NA predicted ratings of the importance of and confidence in attaining avoidance goals for a socially stressful speech task, NA was unrelated to both the number of approach goals and the number of avoidance goals listed by speech anxious participants. Although it is possible that NA relates to social goals differently in the context of

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[3] Interestingly, NA was also associated with increased helping in these studies, an effect that the authors largely attribute to efforts at mood repair (Cunningham, Steinberg, & Grev, 1980; Shaffer & Smith, 1985).

social interaction anxiety, these findings suggest that PA may be particularly important to social goals and behaviour.

This notion is consistent with Fredrickson's (1998) broaden and build model of positive emotions. According to this model, whereas negative emotions narrow an individual's thought-action repertoire and promote specific action tendencies (e.g., escape), positive emotions broaden the thought-action repertoire, allowing individuals to discard automatic behavioural scripts and pursue novel and creative paths of thought and action. In doing so, they build enduring physical, intellectual, and social resources, including social relationships (Fredrickson, 1998). By broadening an individual's thought-action repertoire, positive emotions may help to loosen the grip that negative emotions can have on people's thinking (Fredrickson, 1998; Fredrickson & Levenson, 1998). This may promote social approach over social avoidance. This also suggests that the PA deficits in social interaction anxiety (e.g.,Hughes et al., 2006; Kashdan, 2002) may be particularly detrimental, as reduced PA may support a shift towards narrow and self-protective social avoidance behaviour.

The notion that affect may have a direct influence on goal setting is also consistent with the affect-as-information hypothesis (Clore, Gasper, & Garvin, 2001). This hypothesis argues that people often make judgments based on how they feel about the situation at the time. These feelings provide feedback regarding unconscious appraisals that guide judgment, decision making, and information processing. This may have a notable impact on goal-directed activity (Clore et al., 2001). When focused on a particular task, emotions may be experienced as feedback about one's ability to perform well on the task, influencing the extent to which a person relies on their own beliefs, expectations, and inclinations and signalling whether to "go" or to "stop" (Clore et al., 2001). In a classic paper, Schwartz and Clore (1983) discussed two studies

supporting the idea that people use their momentary affective states as information in making judgments about how happy and satisfied they are with their lives. Whereas participants experiencing negative moods were more likely to attribute these moods to salient situational factors, discounting them as reasonable sources of information for making judgments, participants experiencing positive moods used their current affect as information in making judgments, regardless of possible situational explanations for their mood (Schwarz & Clore, 1983). This supports the idea that momentary PA may have a particularly pronounced effect on cognitive processes relevant to goal setting.

It is somewhat unclear, however, whether momentary affect will influence judgment and decision making in the same way when individuals display a characteristic and pervasive pattern of NA. Clore et al. (2001) suggest that individuals with chronically elevated affect may have difficulty determining when their feelings are relevant to the task at hand. This may increase the impact of momentary affect on decision making. However, Schwartz and Clore (1983) suggest that participants who regularly experience NA (and people in social situations in which NA is expected) may experience PA as deviating from their normal experience and attempt to "explain it away", decreasing the impact of PA on cognition. Kramer and Yoon (2007), on the other hand, have found that PA is used as input in making evaluative judgments regardless of an individual's motivational tendencies (i.e., dispositional approach and avoidance motives), whereas NA is used only by individuals with a predominant approach orientation. These authors argue that avoidance oriented individuals who tend to experience more NA may only be influenced by affective states that differ from their trait affective tendencies and are thus salient (i.e., PA; Kramer & Yoon, 2007). Given the affective profile of social interaction anxiety, it is somewhat

unclear whether PA, NA, or both will come to influence social goal selection, although PA may prove to have a greater impact overall.

1.7 Evaluating a Hierarchical Model of Approach and Avoidance in Social Interaction Anxiety

This research suggests that affect, particularly PA, may help to predict idiographic social goals. To examine this possibility and clarify the relationships between motivational tendencies (i.e., BIS/BAS sensitivity), social interaction anxiety, state affect, and goals, a hierarchical model of approach and avoidance in social interaction anxiety was developed, based in part on the work of Elliot (2006) and Gable (2006). This model, presented in Figure 2, includes social interaction anxiety and affect as potential mediators in the relationship between approach and avoidance motives and goals.[4] The relationships expected between the variables are outlined below. Additional relationships that have been observed in previous studies are also described.

1.7.1 Hypothesized relationships. Based on the empirical literature reviewed above, both approach and avoidance motives (i.e., BIS and BAS sensitivity) are expected to influence social interaction anxiety, with BIS sensitivity positively and BAS sensitivity inversely predicting social anxiety. Social interaction anxiety, in turn, is expected to predict low state PA and high state NA during the anticipation of a social interaction with an unfamiliar same-sex peer. PA and NA are then expected to influence the selection of social approach and avoidance goals, with PA predicting increased approach goals and NA predicting increased avoidance goals. Given the relationship that Rodebaugh and Shumaker (2012) found between PA and confidence in attaining social avoidance goals, a direct link between PA and avoidance goals may also exist. Similarly, state NA (particularly fearful aspects of NA) has been shown to

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[4] Residual error terms are omitted from all figures.

inversely correlate with approach goals (Sideridis, 2005) suggesting a potential pathway between NA and social approach goals. These pathways are included in Figure 2.

Consistent with Gable (2006), this model also includes direct connections between approach and avoidance motives and social goals. Providing support for this notion, both BIS and BAS sensitivity significantly predict avoidance (relative to approach) goals in the achievement domain (Heimpel et al., 2006). BIS and BAS sensitivity have also been linked to behaviour in the social domain, with positive associations between BAS sensitivity and sociability (Carver, 2004b) supporting a direct relationship between approach motives and social behaviour. Similarly, Nikitin and Freund (2010) found that avoidance motivation during a social interaction task was associated with passive behaviour while approach motivation was associated with active behaviour. These connections between motives and social behaviours imply a corresponding relationship with the goals that drive these behaviours. Accordingly, BAS sensitivity is expected to predict social approach goals and BIS sensitivity is expected to predict avoidance goals.[5]

In addition to these primary relationships, the model outlined in Figure 2 includes several residual correlations that may exist between the variables. As a number of studies have found non-significant correlations between measures of BIS and BAS sensitivity in clinical and non-clinical samples (e.g., Campbell-Sills et al., 2004; Gable et al., 2000; cf. Muris et al., 2005), these variables are hypothesized to be independent trait-level predictors. A residual correlation is, however, expected between state PA and NA. Although PA and NA are argued to be largely orthogonal (e.g., L. A. Clark & Watson, 1991; Watson, Clark, & Carey, 1988; Watson, Clark, & Tellegen, 1988) and several studies have found that state PA and NA are relatively independent

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[5] The exploratory approach taken in Study 1 will also allow us to detect unexpected relationships between motivational tendencies and goals, should avoidance tendencies be inversely (or directly) related to approach goals or vice versa (see Higgins, 1997; Molden, Lee, & Higgins, 2008).

(Hughes & Kendall, 2009; Kashdan & Roberts, 2004, 2006), other studies have observed

significant moderate correlations between trait (T. A. Brown et al., 1998; Kashdan & Steger,

2006) and daily measures of PA and NA (Gable et al., 2000). A residual correlation may be

observed due to shared method variance (i.e., the scales coming from the same measure) and

other shared influences (i.e., variables not included in the model; Chorpita et al., 2000).

Consistent with this, Chorpita et al. (2000) found a significant residual correlation between PA

and NA in a path analysis linking affect to a range of clinical symptoms. Lastly, the use of

complementary (but not redundant) proportion scores is expected to contribute to a significant

residual correlation between idiographic social approach and avoidance goals, again due to

shared method variance.

      1.7.2 Additional possible relationships. The model outlined in Figure 2 argues that

there are hierarchical relationships between motivational tendencies, social interaction anxiety,

affect, and social approach and avoidance goals. However, this model is largely exploratory. It is

possible that motivational tendencies will directly predict affect, just as it is possible that social

anxiety will directly predict social goals. The evidence in support of these potential relationships

is outlined below.

      1.7.2.1 Direct relationships between BIS/BAS sensitivity and affect. Approach and

avoidance tendencies may have a direct impact on affect. Positive emotions such as eagerness,

excitement, and elation have been conceptually linked to approach motivation, whereas negative

emotions such as anxiety and guilt have been linked to avoidance/withdrawal (Bjornebekk, 2008,

2009; Carver, 2004b; Carver et al., 2000; Gray, 1982). Empirical research generally supports

these predictions, (e.g., Bjornebekk, 2009; Campbell-Sills et al., 2004; cf. Harmon-Jones, 2003).

In addition, higher order factor analyses support a link between motivational and affective

tendencies, with BIS sensitivity loading with negative affectivity and BAS sensitivity loading with positive affectivity (Heubeck, Wilkinson, & Cologon, 1998). Approach and avoidance tendencies have also been linked to state-level PA and NA. Gable, Reis, and Elliot (2000) found that BAS sensitivity predicted average daily PA whereas BIS sensitivity predicted daily NA. Similarly, BIS sensitivity and social avoidance motivation have been linked to state NA in response to a social speech task (Levinson et al., 2011) and to nervousness and state PA and NA in response to a social interaction, whereas BAS sensitivity has been linked to positive emotions, happiness, and state PA in response to a social interaction with an unfamiliar peer (Nikitin & Freund, 2010).

In addition, several studies have observed inverse relationships between BIS sensitivity and trait PA (Campbell-Sills et al., 2004; Heubeck et al., 1998; Kashdan & Roberts, 2006; Levinson et al., 2011) and between BAS sensitivity and trait NA (Bjornebekk, 2009; Campbell-Sills et al., 2004; Coplan et al., 2006; Heubeck et al., 1998; Kashdan & Roberts, 2006). BAS sensitivity has been linked both theoretically (Carver & Scheier, 1998) and empirically (Carver, 2004b; Harmon-Jones, 2003) to sadness and anger and is inversely associated with depressive symptoms in clinical samples, supporting a relationship between the BAS and negative emotional states (e.g., Campbell-Sills et al., 2004). Small but significant relationships have also been observed between facets of BAS sensitivity and nervousness in response to imagined scenarios (Carver, 2004b). BIS sensitivity has also been linked to lower average daily PA (although this effect was inconsistent across studies; Gable et al., 2000) and lower state PA following a social interaction with an unfamiliar peer (although this relationship became non-significant after controlling for trait PA and NA, curiosity, and social anxiety; Kashdan & Roberts, 2006).

These findings are not necessarily surprising, as Carver and Scheier (1990, 1998) have argued that both approach and avoidance motives can result in PA or NA, depending on the success or failure of goal pursuit. However, less intuitive findings have also emerged. For example, the BAS fun-seeking subscale has been linked to increased trait NA and decreased trait PA in some studies (Levinson et al., 2011). Negative results have also been found, with some studies finding BIS sensitivity to be unrelated to NA (Harmon-Jones, 2003), others finding no relationship between BAS sensitivity and state PA and NA in response to an interaction with an unfamiliar opposite sex peer (Kashdan & Roberts, 2006), and still others finding that, although social avoidance motivation predicted nervousness and inversely predicted positive mood, alertness, and life satisfaction over the previous three months, approach motivation did not predict these variables (Nikitin & Freund, 2010).

These finding suggest that general motivational tendencies may predict state affect, although it is somewhat unclear how these relationships will manifest. These direct relationships are not included in Figure 2, as social interaction anxiety is expected to have a more pronounced and direct impact on momentary affect. However, it is important to acknowledge that these relationships may emerge. Consistent with this, Kashdan (2002) found that both social anxiety and neuroticism, a variable that has been linked to BIS sensitivity and avoidance tendencies (Elliot & Thrash, 2002; Gable et al., 2003), inversely predicted PA, supporting an independent effect of motivation on affect.

1.7.2.2 Direct impact of social interaction anxiety on goals. Social anxiety may also have a direct effect on social goals. As discussed above, socially anxious individuals show greater concern with avoiding disapproval, are more likely to adopt self-protective strategies (Meleshko & Alden, 1993), and identify more specific goals for prevention behaviour than for

promotion behaviour (Rodebaugh, 2007). Further, social anxiety correlates with measures of

social avoidance (Leary et al., 1986), decreased prosocial behaviour, increased socially helpless

behaviour (Gazelle & Rudolph, 2004), and facilitation of avoidance relative to approach

behaviour (Roelofs et al., 2009). This suggests that social anxiety may have a direct impact on

social goals and, in turn, social behaviour. Although direct relationships between social

interaction anxiety and goals are not included in the model outlined in Figure 2, again because

momentary affect is expected to play a more immediate role in goal selection than general

affective tendencies (i.e., dispositional social anxiety), it is possible that these relationships may

emerge.

   1.7.3 Uncertainty regarding the role of affect in goal selection. Whereas hierarchical

models clearly argue that motives predict subsequent goals (Elliot, 2006; Gable, 2006), the

positioning of affect is somewhat less clear. Although the literature reviewed above suggests that

affect may influence goal selection (e.g., Bagozzi et al., 2000), a considerable amount of research

and theory has focused on the emotional consequences of goal attainment (or failure). Some have

argued that, although affect is thought to direct attention, guide problem-solving, stimulate

learning, and trigger behaviour, goals serve as a more strategic and flexible element of behaviour

control and participants may select their goals in order to influence their affect (Bjornebekk,

2008). In addition, anticipating the prospect of goal success or failure can trigger both

anticipatory and immediate emotions (S. P. Brown, Cron, & Slocum, 1997; Van Boven &

Ashworth, 2007). Anticipatory emotions, in turn, may play an important role in stimulating

volitions, goal directed behaviour, and performance (Bagozzi et al., 1998; Wiese, 2007). It is

possible that anticipating a social interaction may activate social goals which, in turn, trigger

anticipatory emotions and color responses to measures of PA and NA. In this way, social goals

could influence momentary affect. This ambiguity indicates that it is important to establish whether affect serves as a predictor or an outcome of social goal selection. To investigate this issue, an alternate model with social goals predicting state affect will also be examined.

1.8 The Present Studies

Two studies were conducted to evaluate the relationships between approach and avoidance motivation (i.e., BAS and BIS sensitivity), social interaction anxiety, state PA and NA, and social approach and avoidance goals. While these studies were designed to determine whether the model outlined in Figure 2 would provide a reasonable fit to the data, an exploratory approach was taken given that hierarchical models of approach and avoidance have not been empirically evaluated in the context of social interaction anxiety and it is possible that additional pathways between the variables will emerge. The first study sought to establish the pattern of relationships between these variables while the second study sought to replicate these findings.

These studies will help to clarify the nature of approach and avoidance processes in social interaction anxiety and determine whether affect may be a worthwhile target for interventions designed to shift the balance between approach and avoidance. Researchers have suggested that simply reframing avoidance goals in terms of positive outcomes may have limited effectiveness given that this approach does not address the antecedents of goal adoption (Elliot et al., 1997). If affect predicts approach and avoidance goals in social interaction anxiety, it may be possible to alter an individual's social goals by changing their affect. Previous research by Alden and Trew (2012) has suggested that it is possible to increase PA in socially anxious individuals. Further, this increase in PA was accompanied by a decrease in social avoidance goals. If a direct relationship is found between momentary affect and social goals, it will be worth investigating

whether it is possible to replicate Alden and Trew's (2012) findings to confirm a positive effect of PA enhancement on social motivation.

1.9 Specific Contributions

This research contributes to the literature by developing a hierarchical model linking approach and avoidance motivation to social interaction anxiety, affect, and idiographic social goals. It is the first research to simultaneously investigate these relationships in the context of social anxiety. This research also extends previous findings by formally including momentary affect as a midlevel predictor in a full hierarchical model of approach and avoidance motivation, helping to clarify the role that affect plays in goal selection when general motivational tendencies are taken into consideration. In doing so, this research will help to determine whether changing affect is likely to alter problematic avoidance patterns in social interaction anxiety. Finally, this research contributes to the literature by investigating idiographic goals for an anticipated social interaction in socially anxious individuals. Although Rodebaugh has conducted several studies investigating idiographic goals for a social speech task (Rodebaugh, 2007; Rodebaugh & Shumaker, 2012), goals for an impending social interaction are more immediately relevant to social interaction anxiety. Investigating these goals will provide additional insight into the nature of approach and avoidance processes in social relationships and the way that social interaction anxiety affects these processes.

2 Study 1[6]

The model outlined in Figure 2 reflects one possible pattern of relationships between the variables given the theoretical and empirical literature and the nature of the hierarchical models proposed by Elliot (2006) and Gable (2006). However, as discussed above, this model is necessarily tentative. Study 1 adopted an exploratory approach to determine whether the hypothesized model provides a reasonable fit to empirical data while allowing all significant pathways to be identified, regardless of whether they were consistent with the study hypotheses. This is an important first step in evaluating the nature of approach and avoidance processes in social interaction anxiety.

2.1 Method

2.1.1 Participants. One hundred eighty-six undergraduate participants from the University of British Columbia completed the study questionnaires and the social goals elicitation procedure described below (70.43% female; mean age = 20.26, *Standard Deviation (SD)* = 3.90; mean years of university completed = 2.12, *SD* = 1.39). Sixty-five participants identified themselves as being of European descent, 78 as being of Asian descent, 17 as being of Indo-Canadian descent, one as being First Nations Canadian, and 25 as being of "other" cultural descent. All participants were required to have at least 10 years of experience speaking English to ensure full comprehension of the written measures. Independent samples t-tests indicated that native English speakers did not differ from participants who spoke English as a second language on any study variables (all *p*s > .21). This suggests that English language experience did not affect average responses to the variables of interest. Further examination revealed that 27.62% of

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[6] A version of chapter 2 has been published. Trew, J. L., & Alden, L. E. (2012). Positive affect predicts avoidance goals in social interaction anxiety: Testing a hierarchical model of social goals. *Cognitive Behaviour Therapy*, *41*, 174–183. doi:10.1080/16506073.2012.663402

the 186 participants included in the main analyses had scores of 34 or higher (*Mean (M)* = 25.34,

SD = 12.80) on the Social Interaction Anxiety Scale (Mattick & Clarke, 1998). Given that a

score of 34 is a commonly used clinical cut-off for this scale (Heimberg, Mueller, Holt, Hope, &

Liebowitz, 1992) that may be conservative in undergraduate samples (Rodebaugh, Woods,

Heimberg, Liebowitz, & Schneier, 2006), it appears that this sample reflects a meaningful level

of social interaction anxiety.

2.1.2 Measures.

2.1.2.1 Behavioural inhibition system/behavioural activation system scales (BIS/BAS;

Carver & White, 1994). The BIS/BAS is a 20-item self-report scale that assesses dispositional

BIS and BAS sensitivities (i.e., avoidance and approach motives), with items rated on four-point

scales (1 = strongly disagree; 4 = strongly agree). This measure includes four subscales (BIS,

BAS-drive, BAS-fun seeking, and BAS-reward responsiveness) that have been shown to load

strongly onto two second order factors assessing BIS and BAS sensitivity in undergraduate

samples (Carver & White, 1994; c.f., Heubeck et al., 1998) and patients with mood and anxiety

disorders (Campbell-Sills et al., 2004). The BIS subscale includes two items that are reverse

scored. In previous studies, test-retest reliability over eight weeks ranged from .59 to .69 (Carver

& White, 1994). Bivariate correlations with measures of motivation and affect support the

relative orthogonality of the BIS and BAS dimensions and the convergent and discriminant

validity of the subscales. Data demonstrating that the BIS scale predicts negative responses to

cues of punishment whereas the BAS-drive and BAS-reward responsiveness subscales predict

positive responses to reward cues support the predictive validity of the BIS/BAS (Carver &

White, 1994). Internal consistency for the subscales varies from marginal to acceptable, with

coefficient alpha values ranging from .66 to .76 (Carver & White, 1994).

Although this measure was developed based on the original, unrevised reinforcement sensitivity theory, the BIS subscale is thought to reflect activation in both the BIS and the FFFS, tapping into activation of the punishment (i.e., avoidance) system under the updated reinforcement sensitivity theory (Smillie et al., 2006). It is also important to note that there is some debate regarding the utility of the BAS subscales. As the four factor structure outlined by Carver and White (1994) has not been supported in children, researchers have suggested using the overall BAS scale which has been shown to correlate in a theoretically meaningful way with affective and personality variables (Bjornebekk, 2009; Muris et al., 2005). As the present study is focused on general motivational tendencies rather than the specific facets measured by the BAS subscales, the overall BAS scale was used. This is consistent with several recent studies that have used the overall BAS scale rather than the BAS subscales (e.g., Harmon-Jones, 2003; Heimpel et al., 2006; Kashdan & Roberts, 2006). Cronbach's alpha values in the present study were .80 for BIS sensitivity and .79 for BAS sensitivity. The BIS and overall BAS scales were used as measures of dispositional approach and avoidance motivation.

     2.1.2.2 Social interaction anxiety scale (SIAS; Mattick & Clarke, 1998). The SIAS is a 20-item measure assessing cognitive, affective, and behavioural aspects of social interaction anxiety. SIAS items are rated on five-point scales (0 = not at all characteristic or true of me, 4 = extremely characteristic or true of me). Three items are reverse-scored. The SIAS has high internal consistency and temporal stability, with a four week test-retest reliability of .92 in previous studies (Mattick & Clarke, 1998). In support of its construct validity, scores on the SIAS are significantly higher in clinically diagnosed social anxiety disorder than they are in agoraphobia, simple phobia, or community and undergraduate normative samples and the SIAS has been shown to correlate more strongly with other self-report measures of social anxiety (i.e.,

$r = .66$ to .74) than with related constructs such as depression (i.e., $r = .30$ to .58; Mattick &

Clarke, 1998). Cronbach's alpha in the present study was .92.

   2.1.2.3 Positive and negative affect schedule (PANAS; Watson, Clark, & Tellegen,

1988). The PANAS is a commonly used 20-item mood measure, with separate subscales

assessing activated forms of PA and NA (e.g., enthusiastic, distressed). Deactivated affective

states (e.g., calmness, dejection) are not assessed. Items are rated on five-point scales (1 = very

slightly or not at all, 5 = extremely). Participants were asked to rate how they feel "right now

(that is, at the present moment)". The PANAS has eight week test-retest reliabilities of .54 for

PA and .45 for NA using the 'present moment' instructions (Watson, Clark, & Tellegen, 1988).

Although these test-retest reliabilities are not particularly high, it is important to note that this

measure assesses momentary affect when these instructions are used and high test-retest

reliability values should not be expected. However, the significant level of temporal stability,

even in the momentary affect ratings, suggests that the PANAS scales reflect strong dispositional

affective tendencies (Watson, Clark, & Tellegen, 1988). The PANAS compares favorably to

other brief affect measures in terms of factorial validity, with discriminant correlations of -.16 or

less and convergent correlations of .91 to .94 (Watson, Clark, & Tellegen, 1988). Confirmatory

factor analyses also support the construct validity of the PANAS (Crawford & Henry, 2004).

Cronbach's alpha values in the present study were .86 for PA and .85 for NA.

   2.1.2.4 Social goals elicitation procedure. Idiographic goals for an anticipated social

interaction were assessed using an approach adapted from the Personal Goals Elicitation

Procedure (PGEP) outlined in detail by Elliot and Friedman (2007). Based on similar procedures

used by Little (1983) and Emmons (1986), the PGEP involves asking participants to write short

statements indicating what they are trying to do in their daily behaviour. In the present study,

participants were informed that they would be engaging in a brief, unstructured conversation with an unfamiliar same sex peer for the purpose of getting to know them better and were asked to indicate what will try to do, or not do, during the interaction, regardless of whether they are successful or not. A same sex first meeting interaction was selected for this task as this type of interaction has an implicit evaluative focus and is directly relevant to social interaction anxiety. First meeting encounters are particularly relevant as they are important in establishing new relationships. In addition, dispositional approach and avoidance tendencies may be particularly relevant when socializing with new people, as there is pressure to demonstrate adequate social behaviour without clear expectations regarding the specific behaviour that would be the most adaptive (Nikitin & Freund, 2008). As in Kashdan and Roberts (2004), a same sex interaction was selected as this type of interaction is perceived as "qualitatively different" and less distressing than interactions with opposite sex strangers (Alden, Teschuk, & Tee, 1992, p. 254).

Participants were given sample goals from the employment domain to avoid priming specific responses. These goals varied in approach and avoidance content (e.g., *Do well on my annual performance review*, *Avoid missing deadlines*), with a short list of approach goals followed by a short list of avoidance goals. The distinction between approach and avoidance goals was not explicitly mentioned or discussed in the verbal or written task instructions. Participants were asked to list at least five goals that they had for the interaction. Participants were also asked to rate each goal using a number of different rating scales based on a procedure outlined by Little (1983). These ratings were not analyzed in the present study and will not be discussed further in this dissertation. Participants did not actually complete an interaction task. The materials used for the Social Goals Elicitation Procedure are included in Appendix A.

2.1.3 Goal coding. Although many researchers have focused on categorizing goals according to pre-determined conceptual categories such as approach and avoidance (e.g., Elliot & Friedman, 2007), others have argued that this approach may artificially limit the range of goals examined and the description of goal content (Dowson & McInerney, 2001). Previous studies have identified complexity within the overall categories of approach and avoidance, with one study reporting 14 approach goal categories and nine avoidance goal categories in an exploratory factor analysis of clinician rated and self-reported goals from several clinical and nonclinical samples (Grosse Holtforth & Grawe, 2000 as cited by Holtforth, 2008; Holtforth & Grawe, 2003 as cited by Holtforth, 2008). Consistent with this, an examination of the social goals listed by participants in the present study revealed a range of subtle nuances that were not captured by a simple approach/avoidance distinction. Based on the apparent complexity of the goals listed by the participants, a content analysis was conducted to classify participants' goals for the anticipated social interaction. This content analysis involved identifying and discussing several dominant themes that were apparent in the goals listed by the participants. The goals were then coded independently by two raters and any differences in coding were discussed and resolved. The categories identified by the content analysis were then described in detail.

This content analysis suggested that there were multiple categories of social approach and avoidance goals. Avoidance categories included anxious avoidance goals reflecting social evaluative concerns (e.g., *Not embarrass myself*) and non-anxious avoidance goals that did not clearly reflect a fear of negative evaluation (e.g., *Do not show off*). Approach categories included goals that were clearly prosocial in nature and were focused on making a connection with the other person, getting to know them better, making them feel comfortable, or improving the interaction itself (e.g., *Make my partner feel liked*), personal goals that did not focus on the other

person or improving the interaction but rather focused on attaining positive outcomes for the participant themselves (e.g., *Promote dodgeball*), impression management goals that involved attempting to portray a specific image to the other person (e.g., *Come across as intelligent*), information seeking goals that involved asking specific questions or talking about specific topics (e.g., *Ask about his major*), and anxious approach goals that appeared to be motivated by social evaluative concerns (e.g., *Try to make eye contact*). Goals that were ambiguous or irrelevant to the upcoming interaction (e.g., *Exercise more*) were classified separately. The coding system used to categorize these goals is reproduced in Appendix B.

Following Elliot and Friedman (2007), goals with content from multiple domains (i.e., goals with an approach element and an avoidance element or elements from different subcategories) were coded according to the first theme encountered unless later elements suggested a different underlying motive (e.g., *Make sure I smile and don't seem condescending* which suggests both evaluative and non-evaluative concerns about self-presentation). These latter goals were classified as ambiguous. Two independent raters who were blind to participants' scores on the study measures coded the goals. One of these raters was fully independent of the content analysis described above. Inter-rater reliability was high: *Kappa* = .81, *p* < .001 for the full coding system and .85, *p* < .001 for an abbreviated three category system that focused on the variables included in the primary analyses (i.e., prosocial approach, anxious avoidance, other; see below).

As the number of goals listed by participants varied (*Range* = 2-13, *M* = 6.20, *SD* = 1.70), proportion scores were analyzed to limit the influence of differential response rate (i.e., the proportion of a participant's social goals that were categorized in a particular category). The total number of goals listed by the participants did not correlate with any of the study variables (all *p*s

> .25) suggesting that the decision to use proportion scores had a minimal impact on the results obtained. On average, the proportion of anxious avoidance goals listed was .11 (SD = 0.14), the proportion of non-anxious avoidance goals listed was .08 (SD = 0.13), the proportion of prosocial approach goals listed was .28 (SD = 0.23), the proportion of personal approach goals listed was .05 (SD = 0.11), the proportion of impression management goals listed was .08 (SD = 0.13), the proportion of anxious approach goals listed was .12 (SD = 0.14), the proportion of information seeking goals listed was .13 (SD = 0.24), the proportion of ambiguous goals listed was .13 (SD = 0.15), and the proportion of irrelevant goals listed by participants was .02 (SD = 0.09).

Given that this study was designed to examine general approach and avoidance processes relevant to social anxiety, the approach and avoidance categories that occurred most frequently, were the least ambiguous, and were the most conceptually relevant to social interaction anxiety (i.e., prosocial approach and anxious avoidance) were used for the main analyses. Anxious avoidance goals have clear relevance to social anxiety. In addition, Kashdan et al. (2011) have argued that "besides being immediately gratifying, prosocial behavior serves to build social self-efficacy and healthy relationships" (p. 795), supporting the relevance of prosocial goals to the establishment of meaningful social relationships and cognitive processes relevant to social anxiety. The proportion of prosocial approach goals listed by participants ranged from .00 to 1.00. The proportion of anxious avoidance goals listed ranged from .00 to .60. This suggests some degree of range restriction in the number of avoidance goals listed by participants that may reduce the predictive ability of avoidance goals. However, it is important to note that previous studies have found that participants tend to report more approach goals than avoidance goals, with approximately 10% of goals, on average, reflecting avoidance content in both social and

non-social situations (e.g., Coats, Janoff-Bulman, & Alpert, 1996; Elliot & Friedman, 2007; Rodebaugh & Shumaker, 2012). This suggests that the mean and the range for avoidance goals that were obtained in the present study are fairly representative of what has been found in the literature to date.

   2.1.4 Procedure. The study measures and procedures were approved by the University of British Columbia's Behavioural Research Ethics Board prior to commencing participant recruitment. Participants were recruited using the online research participation system operated by the department of psychology and advertisements distributed to students. Participants were tested in groups of one to ten, completing all other measures prior to the Social Goals Elicitation Procedure. At the beginning of the session, participants were informed that they would be paired up with an unfamiliar same sex peer for a five minute unstructured interaction. When there were an odd number of participants, an uneven number of females or males, or when participants knew each other prior to the experiment, participants were informed that students working in the laboratory would come in to help with the interaction task. Participants were informed that they would not be observed during the interaction and that their performance on this task would not be rated. They were then asked to list and rate five or more goals for the upcoming interaction, as outlined in the Social Goals Elicitation Procedure. No actual social interaction took place. After listing and rating their social goals, participants were fully debriefed as to the nature of the study. Participants received partial course credit for their participation.

   2.1.5 Analytical approach. As outlined above, the literature supports a number of pathways between approach and avoidance motives, social interaction anxiety, NA, PA, and approach and avoidance goals. It also supports a hierarchical structure progressing from motives to social anxiety to affect to goals. These relationships are outlined in Figure 2. However, as

discussed above, it is possible that other relationships exist between these variables. With this in mind, the present study took a largely exploratory approach to data analysis. First, the model outlined in Figure 2 was evaluated using path analysis. Briefly, path analysis is a special case of structural equation modelling that involves only observed variables. The goal of path analysis is to see how well a proposed model specifying causal and non-causal relationships between a set of variables accounts for the observed relationships between these variables, as summarized by the sample covariance matrix (Savalei & Bentler, 2006). This technique essentially conducts a set of simultaneous multiple regression analyses. The proposed model is used to estimate the population covariance matrix and this estimate is compared to the observed sample covariance matrix in order to evaluate model fit (Savalei & Bentler, 2006).

After testing the model outlined in Figure 2, path analysis was used to develop a model that provided an optimal fit to the data. A saturated model was evaluated where each variable was linked to every other variable in the model.[7] Multivariate Wald tests were then examined to eliminate unnecessary paths from this fully saturated model. Wald tests provide an estimate of the expected gain in the model chi-squared value (i.e., loss of model fit) when specific paths are eliminated from the model, with small estimated values and non-significant Wald tests ($p > .05$) signalling pathways that can likely be dropped without adversely affecting model fit (Savalei & Bentler, 2006). All pathways flagged by a set of multivariate Wald tests were removed from the model before moving to the next stage of the analyses. The model was then re-evaluated and multivariate Wald tests were used to trim more pathways from the model. This process was repeated until the analyses returned no further Wald tests.

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[7] In the saturated model, BIS sensitivity correlated with BAS sensitivity, the SIAS was predicted by both BIS and BAS sensitivity, both PA and NA were predicted by BIS sensitivity, BAS sensitivity, and the SIAS, both approach and avoidance goals were predicted by BIS sensitivity, BAS sensitivity, the SIAS, PA, and NA, and residual correlations were included between PA and NA and between social approach and avoidance goals.

Univariate Lagrange Multiplier (LM) tests were then examined to determine whether important pathways had inadvertently been eliminated. LM tests complement Wald tests by estimating the predicted drop in the model chi-squared value (i.e., gain in model fit) when a specific path is added to the model (Savalei & Bentler, 2006). Significant LM tests ($p < .05$) were investigated to determine whether the suggested pathways were conceptually meaningful and improved model fit. Meaningful and significant pathways were then added to the model one at a time, starting with the pathways having the most significant LM tests. The significance of these pathways and the multivariate Wald tests from these analyses were then examined to determine whether these pathways should be retained. This was conducted in an iterative fashion, alternating between univariate LM tests and multivariate Wald tests until there were no additional paths to add or remove. This approach reflects the nascent state of the literature and enabled the detection of unanticipated pathways, essentially allowing the data to speak for themselves.

Although it would be possible identify significant predictor variables based on the fully saturated model, developing a more refined model will allow us to determine whether non-significant pathways can be eliminated without adversely affecting model fit. This will allow us to develop a hierarchical model of approach and avoidance processes in social interaction anxiety that includes only the most relevant predictive pathways. This model will provide a conceptual foundation for future studies and an initial framework for integrating research on social motives, affect, and goals into a comprehensive understanding of approach and avoidance processes in social interaction anxiety. In addition, this model may point to new targets for interventions that will shift the balance between approach and avoidance and promote more adaptive functioning.

2.2 Results

2.2.1 Preliminary analyses. Prior to conducting the primary analyses, the data were examined to determine whether there were any cases present that could represent univariate outliers. Univariate outliers were detected by identifying cases with observed values on a given variable that were three or more standard deviations from the mean. Outlier detection was conducted in an iterative fashion until all potential outliers had been identified. One univariate outlier was identified for the BIS, 15 for NA, three for the proportion of avoidance goals reported, and three for the proportion of approach goals reported.

The outlier NA values are of particular interest in the present study given their large number. Closer examination of the raw data revealed no data entry errors or obvious problematic response patterns. A series of independent samples t-tests confirmed that the participants identified as univariate outliers on NA also showed higher scores on the BIS ($M = 22.87$, $SD = 3.48$ vs. $M = 20.30$, $SD = 3.69$, $t(182) = 2.59$, $p = .01$, *Cohen's d* $= 0.70$) and the SIAS ($M = 35.21$, $SD = 13.09$ vs. $M = 24.52$, $SD = 12.46$, $t(179) = 3.07$, $p = .002$, *Cohen's d* $= 0.86$) and reported a lower proportion of approach goals ($M = 0.16$, $SD = 0.17$ vs. $M = 0.29$, $SD = 0.23$, $t(184) = -2.03$, $p = .04$, *Cohen's d* $= -0.55$) relative to the cases that were not identified as outliers. Given that the purpose of this study is to examine approach and avoidance processes relevant to social interaction anxiety, omitting these cases would appear to remove meaningful variance from the dataset. The high levels of momentary NA reported by these participants suggest that the prospect of interacting with an unfamiliar peer was effective at triggering anxiety in the more socially anxious participants. This is precisely the type of affective response that would be expected to influence goal selection. With this in mind, the main analyses were conducted with all univariate outlier values retained. However, to confirm that these participants

did not have an undue influence on the analyses, the analyses were repeated after omitting these cases. These results are included in footnotes in the relevant sections.

A series of multiple regression analyses were also conducted to determine whether the assumptions of multiple regression were met in all of the pathways represented in the saturated model and to identify potential multivariate outliers. Examination of the bivariate scatterplots supported linear relationships between all of the variables. Slight non-normality of the residuals was detected in the multiple regression analyses using the BIS, BAS, and SIAS to predict NA, using NA to predict PA (this analysis was used to examine the relationship between NA and PA), and using the BIS, BAS, SIAS, PA, and NA to predict the proportion of avoidance goals reported. Cook-Weisberg score tests (Cook & Weisberg, 1999) indicated heteroscedasticity of the residuals in the analyses using the BIS, BAS, and SIAS to predict NA, $\chi^2(1) = 18.39$, $p <$ .001, using the BIS, BAS, SIAS, PA, and NA to predict the proportion of approach goals reported, $\chi^2(1) = 15.96$, $p < .001$, and using the proportion of approach goals to predict the proportion of avoidance goals reported (used to examine the relationship between approach and avoidance goals), $\chi^2(1) = 9.74$, $p < .001$.[8] Based on this, all parameters, including the model chi-squared values, were bootstrapped to ensure that any potential distortions in the standard errors that resulted from non-normality or heteroscedasticity of the residuals did not affect the conclusions drawn from the model. Examination of the leverage, outlier t, and Cook's d values for these analyses indicated that no multivariate outliers were present in the dataset, with the

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[8] Briefly, the Cook-Weisberg score test evaluates whether the variance of the residuals for a given multiple regression equation changes as a function of an individual's predicted value on the outcome variable (Cook & Weisberg, 1999). A significant chi-squared value indicates heteroscedasticity of the residuals.

highest Cook's d around 0.14. This supports the decision to retain the univariate outliers as they do not appear to have undue influence on the regression equations themselves.[9]

2.2.2 Primary analyses. Path analysis was used to simultaneously examine the relationships between motives, social interaction anxiety, affect, and goals. All models were evaluated using EQS 6.1 (Bentler, 2004). The significance of the overall model chi-squared value was considered along with the Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), and the Root Mean Square Error of Approximation (RMSEA) in evaluating model fit. CFI, GFI, and AGFI values greater than .95 and RMSEA values less than .06 are viewed as supporting good model fit (e.g., see L. Hu & Bentler, 1999, for a review). GFI and AGFI values can be seen as analogous to R^2 and adjusted R^2 in multiple regression, providing an estimate of the proportion of variance accounted for by the model. RMSEA values are reported with 90% confidence intervals.

As multivariate kurtosis was within acceptable limits (*Mardia's coefficient* = 1.45), standard maximum likelihood estimation was used to calculate test statistics and standard errors. A number of participants were missing responses to one or more scales, resulting in six distinct missing data patterns. Based on this, full information maximum likelihood estimation was used to account for missing data. Means and standard deviations for all variables are reported in Table 1. Bivariate correlations between these variables are reported in Table 2.

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[9] Examination of the scatterplots and regression diagnostics after omitting the univariate outliers on a listwise basis resulted in similar conclusions. The bivariate scatterplots revealed linear relationships in all cases, non-normality of the residuals was observed in the regression analyses using the BIS, BAS, and SIAS to predict NA, using NA to predict PA, and using the BIS, BAS, SIAS, PA, and NA to predict the proportion of avoidance goals reported, and heteroscedasticity of the residuals was observed in the analyses using the BIS and BAS to predict the SIAS, $\chi^2(1) = 4.12$, $p = .04$, using the BIS, BAS, and SIAS to predict NA, $\chi^2(1) = 7.29$, $p = .007$, using the BIS, BAS, SIAS, PA, and NA to predict the proportion of approach goals reported, $\chi^2(1) = 6.00$, $p = .01$, and using the proportion of avoidance goals to predict the proportion of approach goals reported, $\chi^2(1) = 4.40$, $p = .01$. These results also support the use of bootstrapping. No influential cases were detected through examination of the leverage, outlier t, and Cook's d values, with the highest Cook's d around 0.12.

The model presented in Figure 2 was evaluated using path analysis. The results for this model are presented in Figure 3. Standardized path coefficients are presented with 90% bootstrapped confidence intervals in parentheses. Although all relationships were in the predicted direction with the exception of a very small negative coefficient linking BIS sensitivity to social avoidance goals, this model did not provide an adequate fit to the data, $\chi^2(9) = 28.60$, $p = .0008$, $CFI = .84$, $GFI = .96$, $AGFI = .86$, $RMSEA = .12$ (.07, .16).[10] Model-based bootstrapping with 5000 replications was used to confirm plausible values for the maximum likelihood fit test. This approach involves creating 5000 simulated datasets where the model holds exactly true in the population and calculating the empirical confidence interval for the model chi-squared tests in each of these simulated samples. In this analysis, the obtained chi-squared value was not included in the model-based bootstrapped confidence interval (3.23, 18.34), supporting sub-optimal model fit. Under this model, there were five standardized residuals greater than .10 with the largest at -.18.

Given that the hypothesized model did not provide an optimal fit to the data, an exploratory approach was adopted. A fully saturated model was evaluated using path analysis. The results for this saturated model are presented in Table 3. All of the pathways included in Figure 3 were in the same direction in the fully saturated model, although the inverse relationship between the SIAS and PA decreased considerably in magnitude, as did the relationship between PA and social approach goals and the inverse relationship between NA and social approach

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[10] This model also failed to provide an adequate fit to the data when the univariate outliers were removed from the dataset, *Mardia's coefficient* = -1.74, $\chi^2(9) = 25.03$, $p = .003$, $CFI = 0.85$, $GFI = .96$, $AGFI = .87$, $RMSEA = .11$ (.06, .16). The obtained chi-squared value was outside of the model-based bootstrapped confidence interval (3.18, 17.65), supporting sub-optimal model fit. The paths linking both PA and NA to prosocial approach goals were non-significant, although it is important to note that the standardized path coefficients linking PA to prosocial approach goals, $\beta = 0.15$ (0.03, 0.27), and inversely linking NA to prosocial approach goals, $\beta = -0.14$ (-0.27, -0.01), were nearly identical to the estimates from the full sample and the bootstrapped confidence intervals for these coefficients do not include zero, suggesting that the non-significance of these pathways may be due to a loss of power caused by the exclusion of over 8% of the participants.

goals. These latter two pathways became non-significant in the saturated model. Eleven paths were removed from the saturated model during the process of model refinement. In the resultant model, the inverse relationship between the SIAS and PA proved to be non-significant. Dropping this path did not adversely affect model fit, $\chi^2_{difference}(1) = 3.19$, $p = .07$. The final model is outlined in Figure 4. This final model fit the data well, $\chi^2(12) = 14.29$, $p = .28$, *CFI* = .98, *GFI* = .98, *AGFI* = .95, *RMSEA* = .04 (.00, .09).[11] Further, this model fit the data significantly better than the model from Figures 2 and 3, $\chi^2_{difference}(3) = 14.29$, $p = .003$. The highest standardized residual was .12 and only four standardized residuals met or exceeded .10.[12] The obtained chi-squared value of 14.29 fell well within the model-based bootstrapped confidence interval (5.15, 22.13), supporting the fit of this final model.

   2.2.3 Alternate model. As discussed above, the positioning of affect in this model is somewhat ambiguous, as it is possible that social goals influence momentary affect. To test this notion, a second model was developed by repositioning social goals as predictors of affect in the saturated model. This saturated model was then refined to determine whether this model provides a better fit to the data than the model outlined in Figure 4 with affect predicting goals. Wald and LM tests were used to eliminate a total of 12 paths from the saturated model. The resultant model was nearly identical to the model in Figure 4, with the path between PA and avoidance goals

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[11] This model also fit the data well when univariate outliers were removed from the dataset, *Mardia's coefficient* = -1.74, $\chi^2(12) = 10.02$, $p = .61$, *CFI* = 1.00, *GFI* = .98, *AGFI* = .96, *RMSEA* = .00 (.00, .07). The obtained chi-squared value was within the model-based bootstrapped confidence interval (4.99, 21.57), supporting model fit. The path linking PA to avoidance goals was non-significant in this analysis. Although removing this path did not adversely affect model fit, $\chi^2_{difference}(1) = 3.35$, $p = .07$, it is important to note that the standardized path coefficient was nearly identical to the estimate from the full sample, $\beta = -0.14$ (-0.26, -0.01), suggesting that the non-significance of this pathway may be due to a loss of power caused by the exclusion of over 8% of the participants.

[12] Model fit was also acceptable when raw counts were used in place of proportions for the goal measures, $\chi^2(12) = 16.13$, $p = .19$, *CFI* = .96, *GFI* = .98, *AGFI* = .94, *RMSEA* = .05 (.00, .09), with the obtained chi-squared value falling within the model-based bootstrapped confidence interval (4.96, 21.62). The path linking PA and avoidance goals was marginally significant in this model, $\beta = -0.13$ (-0.24, -0.01). Dropping this path did not significantly affect model fit, $\chi^2_{difference}(1) = 3.14$, $p = .08$. All other coefficients remained significant ($\alpha = .05$).

reversed. This change slightly altered the flow of the model, as PA was now predicted by three variables (i.e., BIS, BAS, and avoidance goals). This model fit the data well, $\chi^2(12) = 14.24$, $p =$ .29, $CFI = .98$, $GFI = .98$, $AGFI = .95$, $RMSEA = .04$ (.00, .09), with the chi-squared value falling within the model-based bootstrapped confidence interval (5.27, 22.62).[13] Six standardized residuals met or exceeded .10 with the largest at .14. The final model is represented in Figure 5. Although the inverse relationship between PA and avoidance goals was slightly stronger when affect predicted goals ($\beta = -0.15$) than it was when goals predicted affect ($\beta = -0.14$), CFI and RMSEA values support an equivalent fit for the models presented in Figures 4 and 5 Given these results, it is unclear whether affect should predict goals or goals should predict affect.

2.3 Discussion

Despite taking an exploratory approach to the analyses, the final model shares some notable similarities with the proposed hierarchical model outlined in Figure 2. As hypothesized, the correlation between BIS and BAS sensitivity was non-significant, with the modification indices supporting the removal of this correlation from the saturated model (see also Campbell-Sills et al., 2004; Gable et al., 2000). This supports the contention that these variables are separable as higher order motivational constructs. Also in line with expectations, BIS sensitivity predicted higher social interaction anxiety while BAS sensitivity predicted lower social interaction anxiety. This is consistent with previous studies linking social anxiety to both high BIS and low BAS sensitivity (Coplan et al., 2006; Kimbrel et al., 2010; Levinson et al., 2011; Movius & Allen, 2005) and to low social approach and high social avoidance motivation (Nikitin

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[13] This model also fit well when the analyses were conducted with the univariate outliers omitted, $\chi^2(12) = 10.36$, p = .58, CFI = 1.00, GFI = .98, AGFI = .96, RMSEA = .00 (.00, .07), with the chi-squared value falling within the model-based bootstrapped confidence interval (5.07, 22.04). As was the case with the original model, the path linking avoidance goals to PA was non-significant and removing this path did not adversely affect model fit, $\chi^2_{difference}(1) = 3.01$, p = .08. This path was, however, quite similar to the path observed in the full sample, $\beta = -0.12$ (-0.23, -0.01).

& Freund, 2010) and supports the argument that high BIS sensitivity (Sportel et al., 2011) and low BAS sensitivity (Kimbrel et al., 2010) are important to the conceptualization of social interaction anxiety.

Social interaction anxiety, in turn, predicted momentary NA. This is consistent with the tri-partite model of anxiety and depression (L. A. Clark & Watson, 1991) and with previous studies linking social anxiety to state NA (e.g., Kashdan & Roberts, 2004, 2006), suggesting that NA experienced during the anticipation of a social interaction is driven primarily by social evaluative concerns. The lack of a direct connection between BIS and BAS sensitivity and NA suggests that the relationship between these variables is fully mediated by concurrent social interaction anxiety. This supports a hierarchical relationship between these motivational and affective variables.

Contrary to expectations, social interaction anxiety did not significantly predict PA in this study, despite a significant bivariate correlation between these two variables and a well-established empirical link between social anxiety and PA deficits (see Kashdan, 2007, for a review). PA was, however, predicted by both low BIS and high BAS sensitivity, with BIS sensitivity proving to be the stronger (inverse) predictor of PA. Although BAS sensitivity has been linked both theoretically and empirically to PA (e.g., Gable et al., 2000, 2003; Nikitin & Freund, 2010), the inverse connection between BIS sensitivity and PA is somewhat at odds with theoretical arguments linking the BAS to positive emotions and PA and the BIS to negative emotions and NA (e.g., Bjornebekk, 2008, 2009; Carver, 2004b; Carver et al., 2000; Gray, 1982, 1990). However, as discussed above, several previous studies have observed an inverse relationship between BIS sensitivity and PA (e.g., Campbell-Sills et al., 2004; Heubeck et al., 1998; Kashdan & Roberts, 2006; Levinson et al., 2011). Consistent with this, factor analytic

studies have detected inverse cross loadings between PA and the BIS (Gable et al., 2003). Given the moderate correlation between BIS sensitivity and the SIAS in the present study ($r = .49$), it is possible that the SIAS accounts for much of the same variance in PA as BIS sensitivity, with general avoidance tendencies proving to be the stronger unique (inverse) predictor of PA. Consistent with this, Kashdan (2002) found that neuroticism (thought to reflect combined BIS-FFFS sensitivity; see Kimbrel, 2008, for a review) was a stronger inverse predictor of positive subjective experiences than social anxiety. These findings suggest that momentary PA may be driven, in part, by basic motivational tendencies and that high BIS and low BAS sensitivity may directly contribute to PA deficits in social interaction anxiety.

Higher levels of PA, in turn, predicted fewer social avoidance goals. This finding is interesting in that, while PA was expected to predict social goals, PA has traditionally been associated with approach goals rather than avoidance goals (e.g., Updegraff et al., 2004). This inverse relationship is, however, consistent with Rodebaugh and Shumaker's (2012) finding that state PA was associated with greater confidence in the ability to attain avoidance goals for a speech task. These findings suggest that PA may encourage prosocial behaviour, in part, by decreasing problematic avoidance tendencies. Conversely, they suggest that the PA deficits associated with social interaction anxiety (e.g., Hughes et al., 2006; Kashdan, 2002) may directly contribute to social avoidance and related adverse outcomes (e.g., low confidence in the ability to attain goals). PA was the only variable to predict social avoidance goals, suggesting that it may be an important target for interventions designed to decrease social avoidance.

PA did not, however, predict social approach goals. This runs counter to recent findings linking PA to the adoption of mastery-approach goals (Bjornebekk, 2007 as cited by Bjornebekk, 2009) and the number of approach goals listed for a socially stressful speech task (Rodebaugh &

Shumaker, 2012). Although PA did show a significant bivariate correlation with approach goals in the present study, it appears that social interaction anxiety is a stronger (inverse) predictor of the intent to engage in prosocial behaviour and connect with others during social interactions. Although not included in Figure 2, a direct inverse relationship between social interaction anxiety and social approach goals is not entirely unexpected, as social anxiety has been linked to reduced prosocial behaviour in socially anxious youth, particularly in the context of social exclusion (Gazelle & Rudolph, 2004). Socially anxious individuals are also slower to approach others and maintain greater physical distance from others (Rinck et al., 2010). These findings suggest that social anxiety may directly reduce adaptive social behaviour, with momentary affect having little additional impact on social approach goals. Social anxiety did not, however, predict avoidance goals, despite research linking social anxiety to the adoption of self-protective strategies (Meleshko & Alden, 1993) and to the identification of more specific goals for prevention behaviour than for promotion behaviour (Rodebaugh, 2007), suggesting that PA deficits have a greater impact on social avoidance tendencies.

NA, on the other hand, failed to predict both approach and avoidance goals. This runs somewhat counter to expectations given that previous studies have linked NA to avoidance motives and goals (e.g., Updegraff et al., 2004) and fearful aspects of NA have been shown to inversely correlate with approach goals (Sideridis, 2005). However, this finding is not unprecedented, as Rodebaugh and Shumaker (2012) found that NA was unrelated to the number of social approach and avoidance goals listed by participants. In addition, the absence of a relationship between NA and social goals is consistent with findings indicating that NA is largely unrelated to sociability (L. A. Clark & Watson, 1988; Watson, 1988; Watson et al., 1992).

Also contrary to expectations, approach and avoidance motives did not directly predict social goals, despite previous findings linking motives to goals and social behaviour (e.g., Carver, 2004b; Heimpel et al., 2006; Nikitin & Freund, 2010). Rather, social interaction anxiety and affect fully mediated the effect of general motivational tendencies on social goals. This is consistent with the argument that emotions mediate the relationship between motives and goals (e.g., Bjornebekk, 2008; Russell & Mehrabian, 1978), with little to no relationship between motives and goals when affect was controlled. This supports a truly hierarchical relationship between motives, affect, and social goals in the context of social interaction anxiety.

Additional pathways that were anticipated by the hypothesized model include the residual correlations for the proportion of approach and avoidance goals reported and for PA and NA (see also T. A. Brown et al., 1998; Chorpita et al., 2000; Gable et al., 2000; Kashdan & Steger, 2006). As suggested above, these residual correlations likely reflect common method variance, particularly in the case of social goals. They may also reflect variance shared with other variables that were not included in this model (Chorpita et al., 2000), such as general emotional reactivity. Unfortunately, evaluation of an alternate model with goals predicting affect did not lead to a definitive conclusion as to whether this model provides a better fit to the data than the model outlined in Figure 4. At this point, it is not entirely clear whether affect is best represented as a predictor or an outcome of social goal selection. Study 2 was conducted in an effort to replicate the pattern of results described above and to further investigate this alternate model.

3 Study 2[14]

Although the majority of the findings from Study 1 were consistent with the study hypotheses, a model developed to provide an optimal fit to one sample may not provide an adequate fit when examined in a different sample. With this in mind, the model developed in Study 1 was evaluated in a second sample of undergraduate participants. If the model outlined in Figure 4 provides an adequate fit to the data collected from a second unique sample of undergraduate participants, the model can be interpreted with greater confidence and the implications of the pathways contained in the model can be explored in greater depth. If, however, the model provides an inadequate fit to the data, it will be important to interpret the results with caution and to avoid drawing strong conclusions from the results of Study 1.

3.1 Preliminary Examination of Projected Type I Error Rate and Power Analyses

Prior to collecting the participant sample for Study 2, a simulation analysis was conducted to determine the approximate type I error rate that would be expected in a new sample, assuming that the model from Figure 4 is true. EQS was used to conduct this analysis. Five thousand simulations were conducted based on the parameter estimates from Study 1 and the projected sample size of 195, assuming approximately 3% missing data (which is consistent with the sample from Study 1). Of these 5000 simulations, 4724 resulted in correct retention of the null hypothesis, suggesting that the projected type I error rate is approximately 5.52% in a sample of 195 participants. This is very near to the nominal level of $\alpha = .05$ and suggests that it is reasonably unlikely that the model from Figure 4 will be erroneously rejected if it is indeed true in the cross-validation sample.

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[14] A version of chapter 2 has been published. Trew, J. L., & Alden, L. E. (2012). Positive affect predicts avoidance goals in social interaction anxiety: Testing a hierarchical model of social goals. *Cognitive Behaviour Therapy*, *41*, 174–183. doi:10.1080/16506073.2012.663402

A series of power analyses were also conducted to determine the likelihood of detecting model misspecification if important paths from the model outlined in Figure 4 were in fact spurious and were not present in the population or if paths from the saturated model were in fact present in the population but had been omitted from the model in Figure 4. To investigate this, data were simulated from a population where a model held true that omitted one path that had been present in the final model or included one path from the saturated model that had been omitted from the final model. Parameter estimates from Study 1 were used as the basis for these simulations. Five thousand simulations were conducted under each scenario using an anticipated sample size of 195 for Study 2. The final model from Study 1 was then evaluated in each of these simulated samples. Power was determined by examining the percentage of replications that correctly rejected the final model from Study 1 (i.e., resulted in significant model chi-squared values). This approach is identical to the Monte Carlo approach used by Satorra and Saris (1985) to verify the accuracy of an alternative approach to approximating power in covariance structure analyses.

The power to detect model misspecification when one path in the final model did not exist in the population was approximately .06 in all scenarios. This is approximately equivalent to the empirical type I error rate described above. This low power to detect model misspecification is not particularly surprising, as each of these scenarios involved including a single extraneous non-consequential path in the model being tested. This is unlikely to have a pronounced adverse effect on the fit indices. The power to detect model misspecification when one path that existed in the population was omitted from the final model ranged from .69 to .85 when the path in question reflected a medium sized effect (i.e., $\beta = 0.30$) and from .11 to .14 when the path in question reflected a small effect (i.e., $\beta = 0.10$). As most of the effects observed

in Study 1 fell between the small and medium effect sizes used in these simulations, it is likely that the actual power to detect model misspecification falls between these estimates. Based on these analyses, it appears that a sample size of 195 will provide reasonable, if not ideal, power for a replication study.

3.2 Method

3.2.1 Participants. One hundred ninety five undergraduates from the University of British Columbia participated in this cross-validation study (76.92% female; mean age = 20.71, SD = 4.98; mean years of university completed = 1.94, SD = 1.48). Fifty-eight participants identified themselves as being of European descent, 86 as being of Asian descent, 11 as being of Indo-Canadian descent, four as First Nations Canadian, and 36 as being of "other" cultural descent. All participants had at least 10 years of experience speaking English. As in Study 1, native English speakers did not differ from participants who spoke English as a second language on any of the study variables (all ps > .12). Further examination revealed that 29.17% of the participants included in the main analyses had SIAS scores of 34 or higher (M = 26.85, SD = 13.20), suggesting that this sample also reflects a meaningful level of social interaction anxiety.

3.2.2 Measures and procedure. The measures and procedure for this study were identical to those used in Study 1. Cronbach's alphas in this sample were .75 for the BIS, .79 for the BAS, .92 for the SIAS, .88 for PA, and .86 for NA. Social goals were coded by two independent raters blind to participants' scores on the study measures. Interrater reliability was high: *Kappa* = .78 for the full coding system and .83, p < .001 for the abbreviated three category system. The total number of goals listed by the participants did not correlate with any of the study variables in this sample (all ps > .17), supporting the use of proportion scores in the analyses.

3.3 Results

Means and standard deviations are reported in Table 1 and bivariate correlations are reported in Table 2. The model developed in Study 1 was evaluated and non-significant paths were examined to determine whether their removal adversely affected model fit. As multivariate kurtosis was again within acceptable limits (*Mardia's coefficient* = 2.70), standard maximum likelihood estimation was used to calculate test statistics and standard errors.[15] A number of participants were missing responses to one or more scales, resulting in seven distinct missing data patterns. Based on this, full information maximum likelihood estimation was used.

3.3.1 Preliminary analyses. Prior to conducting the primary analyses, the data were examined to determine whether the assumptions of regression had been met and whether there were any univariate or multivariate outliers present in the dataset that could affect the results obtained. Univariate outliers were again detected by identifying cases with observed values on a given variable that were three or more standard deviations from the mean. This outlier detection was conducted in an iterative fashion until all potential outliers had been identified. One univariate outlier was identified for the BIS, one for PA, and 22 for NA. The outlier NA values are again of interest given the large number observed. A series of t-tests confirmed that these cases showed higher BIS ($M = 23.52$, $SD = 3.34$ vs. $M = 21.10$, $SD = 3.27$, $t(188) = 3.20$, $p =$ .002, *Cohen's d* = 0.74) and SIAS ($M = 35.05$, $SD = 13.19$ vs. $M = 25.84$, $SD = 12.89$, $t(190) =$ 3.08, $p = .002$, *Cohen's d* = 0.71) scores relative to the cases that were not identified as outliers, suggesting that these cases reflect meaningful variance in NA that may be secondary to dispositional avoidance tendencies and social interaction anxiety. Based on this, the analyses

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[15] Results obtained using Yuan and Bentler's (2000) robust methodology concur with the results reported in the main text. The model displayed roughly the same fit to the data using this robust methodology, $\chi^2(12) = 22.04$, p = .04, CFI = .86, RMSEA = .07 (.02, .11). GFI and AGFI values are not calculated using this approach.

reported in the main text were conducted with all outlier values retained. The results for the

analyses omitting these cases are included in footnotes in the relevant sections.

As in Study 1, a series of multiple regression analyses were conducted to determine

whether the assumptions of multiple regression were met in all of the pathways represented in

the saturated path model. Examination of the bivariate scatterplots supported linear relationships

between all of the variables. Slight non-normality of the residuals was detected in the regression

analyses using the BIS, BAS, and SIAS to predict NA, using NA to predict PA, and using the

BIS, BAS, SIAS, PA, and NA to predict the proportion of avoidance goals reported. Cook-

Weisberg score tests indicated heteroscedasticity of the residuals in the analyses using the BIS,

BAS, and SIAS to predict NA, $\chi^2(1) = 44.20$, $p < .001$, and using the proportion of approach

goals to predict the proportion of avoidance goals reported, $\chi^2(1) = 6.10$, $p = .01$. Based on this,

all parameters, including the model chi-squared value, were bootstrapped to ensure that any

potential distortions in the standard errors did not affect the conclusions drawn from the model.

Examination of the leverage, outlier t, and Cook's d values for these analyses suggested that

there were no multivariate outliers in the dataset, with the highest Cook's d around 0.18. This

again supports the decision to retain the univariate outliers, as they do not appear to have undue

influence on the regression equations.[16]

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[16] Examination of the scatterplots and regression diagnostics with the univariate outliers omitted on a listwise basis
resulted in similar conclusions. The bivariate scatterplots revealed linear relationships in all cases. Non-normality of
the residuals was observed in the regression analyses using the BIS, BAS, and SIAS to predict NA, using NA to
predict PA, and using the BIS, BAS, SIAS, PA, and NA to predict the proportion of avoidance goals reported.
Heteroscedasticity of the residuals was observed in the relationship between the proportion of avoidance goals and
the proportion of approach goals reported, $\chi^2(1) = 4.42$, $p = .04$. These results also support the use of bootstrapping.
One potential multivariate outlier was detected in the analysis using the BIS and BAS to predict the SIAS (Cook's d
= 0.46). The preliminary analyses conducted in the full sample did not flag this case as problematic. This case will
be removed from the analyses omitting the univariate outliers. No other influential cases were detected, with the
highest Cook's d around 0.17.

Lastly, a multivariate analysis of variance was conducted to determine whether this sample significantly differed from the sample used in Study 1 on any of the study variables. There were no multivariate differences between the two samples, $F(7, 345) = 1.77$, $p = .09$. Further, the only significant univariate difference was found for BIS sensitivity, $t(345) = 2.09$, $p = .04$, $d = 0.22$, with the sample from Study 1 scoring slightly lower than the sample from Study 2. More importantly, this analysis indicated that the covariance matrices were invariant across the two samples, *Box's M* $= 27.94$, $F(28, 236986.65) = 0.98$, $p = .50$.

3.3.2 Primary analyses. The model developed in Study 1 provided a reasonable fit to the data, $\chi^2(12) = 21.03$, $p = .05$, *CFI* $= .88$, *GFI* $= .97$, *AGFI* $= .93$, *RMSEA* $= .06$ (.01, .11), with the obtained chi-squared value falling within the model-based bootstrapped confidence interval (5.27, 22.67). The highest standardized residual was -.17 and only four standardized residuals exceeded .10. This model is outlined in Figure 6. Two paths were non-significant (i.e., the SIAS inversely predicting approach goals and the residual correlation between PA and NA). Wald tests suggested dropping these paths. Although this did not have a significant adverse effect on model fit, $\chi^2_{difference}(2) = 5.31$, $p = .07$, the resultant model did not provide an optimal fit to the data, $\chi^2(14) = 26.34$, p $= .02$, *CFI* $= .85$, *GFI* $= .96$, *AGFI* $= .93$, *RMSEA* $= .07$ (.03, .11) with the model chi-squared value falling outside of the model-based bootstrapped confidence interval

(6.66, 25.62). This supports retention of the original model.[17, 18]

      3.3.3 Alternate model. To further investigate the possibility that goals may predict

subsequent affect, the alternate model evaluated in Study 1 was evaluated in the replication

sample and compared to the original model developed in Study 1 (i.e., prior to dropping the

paths that were non-significant in Study 2). This alternate model is presented in Figure 7. This

model provided a marginal fit to the data, $\chi^2(12) = 22.63$, $p = .03$, $CFI = .87$, $GFI = .97$, $AGFI =$

.93, $RMSEA = .07$ (.02, .11), with the highest standardized residual at .17 and four standardized

residuals equal to or greater than .10. As with the original model, the path linking the SIAS to

lower approach goals, $\beta = -0.11$ (-0.22, 0.01), and the residual correlation between PA and NA, β

$= 0.11$ (-0.01, 0.22), were non-significant. The obtained chi-squared value fell outside of the

model-based bootstrapped confidence interval (5.22, 22.54), supporting sub-optimal fit.

Examination of the CFI and RMSEA values indicates that the original model with affect

predicting goals provided a slightly better fit to the data than this alternate model with goals

predicting affect. The Akaike Information Criteria (AIC) for this model supports this conclusion,

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[17] This model provided a marginal fit to the data when the analyses were conducted in a reduced dataset that omitted the univariate and multivariate outliers. $\chi^2(12) = 22.84$, $p = .03$, $CFI = 0.86$, $GFI = 0.96$, $AGFI = 0.91$, $RMSEA = 0.07$ (0.03, 0.12), with the observed chi-square value falling just outside of the model-based bootstrapped confidence interval (5.24, 22.38), This likely reflects the loss of meaningful data due to the omission of 12.82% of the total cases in the original sample. Three pathways became marginal or non-significant in the reduced dataset: the BAS inversely predicting the SIAS, $\beta = -0.14$ (-0.25, -0.02), the SIAS inversely predicting the proportion of approach goals reported, $\beta = -0.15$ (-0.27, -0.02), and the residual correlation between NA and PA, $\beta = 0.08$ (-0.05, 0.21).

[18] This model was also evaluated using goal counts in place of proportions. As notable multivariate kurtosis was observed (*Mardia's Coefficient* = 3.09), Yuan and Bentler's (2000) robust methodology was used to calculate test statistics and standard errors. The model provided a marginal fit to the data, $\chi^2(12) = 24.99$, $p = .01$, $CFI = .80$, $RMSEA = .08$ (.03, .12), with the observed chi-square value falling just outside of the model-based bootstrapped confidence interval (5.39, 24.16). Three paths fell below significance: the SIAS inversely predicting approach goals, $\beta = -0.13$ (0.08, -0.24), the residual correlation between NA and PA, $\beta = 0.12$ (-0.01, 0.23), and the residual correlation between approach and avoidance goals, $\beta = -0.13$ (-0.23, -0.01).

with a model AIC of -2.97 in the original model and a model AIC of -1.37 in the alternate

model.[19] This provides modest support for the decision to situate affect as a predictor of goals.[20]

3.4 Discussion

The model developed in Study 1 was partially replicated in Study 2. Consistent with

Study 1, BIS and BAS sensitivity were independent of one another and both predicted social

interaction anxiety, with BIS sensitivity predicting higher social anxiety and BAS sensitivity

predicting lower social anxiety. Also consistent with Study 1, BAS sensitivity directly predicted

PA, BIS sensitivity inversely predicted PA, and the SIAS predicted NA. This supports the notion

that, although social interaction anxiety is directly associated with NA, the PA deficits in social

interaction anxiety are driven by more basic motivational processes. Importantly, the inverse

relationship between PA and social avoidance goals continued to be significant, suggesting that

this pathway is fairly robust and supporting a direct role of PA in the selection of social goals.

Not surprisingly, a significant residual correlation was again found between social approach and

avoidance goals. As in Study 1, the relationship between general motives and idiographic social

goals was fully mediated by the affective variables, with the path analyses indicating acceptable

fit when the model outlined in Figure 4 was tested in this sample.

Two paths that had been significant in Study 1 failed to reach significance in the present

study: the positive residual correlation for PA and NA and the inverse relationship between

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[19] Smaller AIC values indicate better model fit. In the case of negative values, larger negative values indicate better model fit.

[20] Analyses repeated using the reduced dataset excluding the univariate and multivariate outliers supported these conclusions. The alternate model provided a relatively poor fit to the data, $\chi^2(12) = 25.75$, $p = .01$, $CFI = .82$, $GFI = .96$, $AGFI = .91$, $RMSEA = .08$ (.04, .13), with an AIC of 1.75 (compared to -1.17 for the original model) and an obtained chi-squared value that fell outside of the model-based bootstrapped confidence interval (5.12, 22.33). In this analysis, the paths linking the BAS to the SIAS, $\beta = -0.14$ (-0.25, -0.02), and linking the SIAS to approach goals, $\beta = -0.13$ (-0.25, -0.00), were marginal and the residual correlation between PA and NA, $\beta = 0.09$ (-0.05, 0.20), was non-significant.

social interaction anxiety and approach goals. As mentioned above, PA and NA are argued to be largely orthogonal and uncorrelated (e.g., L. A. Clark & Watson, 1991; Watson, Clark, & Carey, 1988; Watson, Clark, & Tellegen, 1988) with a number of previous studies finding that state PA and NA are relatively independent (Harmon-Jones, Harmon-Jones, Abramson, & Peterson, 2009; Hughes & Kendall, 2009; Kashdan & Roberts, 2004, 2006). Although it is not fully clear why this residual correlation was significant in Study 1 and non-significant in the present study, it is possible that this lack of relationship may reflect a reduction in shared method variance (or incidental error variance) in the present study or the operation of additional variables that were not included in the model such as emotional reactivity or extraversion and neuroticism which have been linked to both motivational and affective tendencies (Elliot & Thrash, 2002; Gable et al., 2003). However, it is also a distinct possibility that the significant residual correlation in Study 1 was the result of capitalization on chance, with the smaller residual correlation in the present study resulting from a form of regression towards the mean (i.e., the mean of the sampling distribution for this residual correlation). Importantly, it appears that this non-significant residual correlation did not have a major impact on the other pathways represented in the model and does not affect the overall interpretation of the findings.

The non-significant pathway linking social interaction anxiety to prosocial approach goals is more conceptually relevant and intriguing. This finding suggests that the direct relationship between social interaction anxiety and prosocial approach goals in Study 1 may have been anomalous. Interestingly, despite the fact that the same raters used the same goal coding system with a similar rate of agreement, prosocial approach goals were only correlated (inversely) with anxious avoidance goals in the present study. In contrast, prosocial approach goals correlated positively with state PA and inversely with BIS sensitivity, social interaction

anxiety, state NA, and anxious avoidance goals in Study 1. This indicates that prosocial approach goals did not show a consistent pattern of relationships with the other conceptually relevant variables across the two studies. It is not entirely clear why this was the case, as the procedure for the two studies was identical.

One possibility is that there may have been significant differences between the two participant samples. However, group differences were only found on one measure (i.e., BIS sensitivity) and the covariance matrices were found to be invariant across the two samples, suggesting that this was not the case. It is also possible that all of the Study 2 participants were equally likely to report prosocial goals, regardless of their level of dispositional motivation, social interaction anxiety, and momentary affect. However, examination of the standard deviations across the two studies suggests similar degrees of variability in the proportion of prosocial approach goals reported by participants. Although the range of prosocial approach goals was slightly smaller in Study 2 (*Range* = .00 to .86), this reduction is fairly slight, suggesting that range restriction is not a plausible explanation for the non-significant relationships observed here. Ultimately, it is unclear why prosocial approach goals failed to relate to social interaction anxiety and other conceptually relevant variables in this sample. It is possible that the lower predictive ability of prosocial approach goals in the present study reflects group differences in some variable or variables relevant to prosocial approach that were not assessed in these studies. However, it is also possible that the significant inverse relationship between social interaction anxiety and prosocial approach goals in Study 1 resulted from capitalization on chance, reinforcing the need to use caution when interpreting this finding.

Lastly, the supplementary analyses provided modest support for the notion that momentary affect influences social goal selection, rather than the other way around. This

provides additional weight to the argument that affect may be an important target for interventions that aim to decrease avoidance tendencies and promote a shift towards social approach. The robust relationship between PA and avoidance goals and the consistent lack of relationship between NA and social approach and avoidance goals suggests that PA may be the most promising target for these interventions.

4 General Discussion for Studies 1 and 2

This pattern of relationships between motives, affective variables, and goals supports a hierarchical model of approach and avoidance processes in social interaction anxiety that moves from the general to the specific. General motivational tendencies were found to influence long-standing affective tendencies (i.e., social interaction anxiety). Both were then linked to momentary affect, with motivational tendencies predicting PA and social interaction anxiety predicting NA. PA, in turn, inversely predicted idiographic social avoidance goals. This lends weight to the argument that both motivation and affect should be considered at different levels of abstraction, separating more distal and dispositional constructs from more proximal and situation specific variables. As dispositional tendencies may be difficult to change, a focus on more proximal affective (i.e., state PA) and motivational (i.e., social avoidance goals) variables may lead to more promising interventions. This hierarchical model provides greater insight into the nature of approach and avoidance processes in social interaction anxiety than could be obtained through the examination of a correlation matrix or series of isolated regression equations.

Overall, this pattern of relationships is largely consistent with the joint subsystems hypothesis (Corr, 2001). Although BIS and BAS sensitivity were "separable" (i.e., independent) as higher order motivational constructs, they demonstrated complementary relationships with both PA and social interaction anxiety, indicating a joint influence on relevant affective outcomes. These relationships are consistent with links that have been observed in a number of previous studies (e.g., Campbell-Sills et al., 2004; Coplan et al., 2006; Gable et al., 2000; Heubeck et al., 1998; Movius & Allen, 2005), indicating that general motivational tendencies are relevant to both dispositional social interaction anxiety and momentary PA experienced during the anticipation of a social encounter.

Also consistent with previous findings (e.g., L. H. Brown et al., 2007; Kashdan & Steger, 2006), social interaction anxiety predicted momentary NA. Although significant inverse bivariate relationships were also observed between social interaction anxiety and PA, this relationship became non-significant after accounting for the effects of both BIS and BAS sensitivity on PA in both studies. These results are, in a sense, consistent with Clark and Watson's (1991) tri-partite model of anxiety and depression as they suggest that, while social interaction anxiety is directly associated with NA, the PA deficits commonly found in social interaction anxiety may be attributable to underlying approach and avoidance motivation rather than to social interaction anxiety itself. This suggests that it is important to closely examine the relationship between social interaction anxiety and PA deficits to determine the extent to which this relationship is attributable to the shared influence of motivational variables.

Interestingly, approach and avoidance motives failed to directly predict social approach and avoidance goals. This indicates that general motivational tendencies may have an indirect effect on social goals through their impact on distal and proximal affective variables (i.e., social interaction anxiety and momentary PA). Although this runs somewhat counter to Gable's (2006) model which argues that there is a direct link between motives and social goals, this pattern of findings is consistent with the notion that motives and temperaments are affectively based (Elliot et al., 2006) and that affect mediates the relationship between motivational tendencies and goals (e.g., Bjornebekk, 2008; Cunningham et al., 1980). This casts affect as a more proximal, and malleable, predictor of social goals, with both studies supporting an inverse link between state PA and social avoidance goals.

This robust inverse connection between momentary PA and social avoidance goals is interesting, particularly given the non-significant relationship between PA and social approach

goals. PA has been linked to general approach tendencies, approach goals, and social activity (e.g., L. A. Clark & Watson, 1988; Gable & Berkman, 2008; Updegraff et al., 2004; Watson et al., 1992), suggesting a likely impact on social approach. Further, Rodebaugh and Shumaker (2012) found a direct link between PA and the number of approach goals listed for a speech task, although it is important to note that this study focused on speech anxiety and the results may not generalize to social interaction anxiety. As suggested above, the lack of relationship between PA and approach goals in the present studies may have been attributable to a stronger effect of social interaction anxiety on approach goals in Study 1 or the weaker predictive ability of prosocial approach goals in Study 2. It is possible that a significant relationship would be found with an alternate measure of social approach goals. However, it appears that momentary PA does predict aspects of social avoidance. Consistent with this, Rodebaugh and Shumaker (2012) identified a relationship between state PA and confidence in attaining avoidance goals for a threatening social speech task, as discussed above. The present studies suggest that the power of PA may lie more in its ability to reduce social avoidance rather than increase social approach, with PA deficits contributing to social avoidance goals in social interaction anxiety. Further, they suggest that addressing these PA deficits may reduce avoidance tendencies.

Contrary to expectations, NA did not predict social goals. One possible explanation for this finding is that the anticipated social interaction may have elicited insufficient momentary NA to influence goal selection.[21] It is possible that NA would have a stronger effect on goal selection in a situation that evokes greater distress (e.g., a social threat task such as a public speech). However, recent findings suggest that this is not likely to be the case, as Rodebaugh and Shumaker (2012) found no relationship between NA and the number of approach and avoidance

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[21] The author would like to thank an anonymous reviewer for this suggestion.

goals listed by participants for a socially stressful speech task. In addition, a subset of

participants in the present studies reported high levels of momentary NA, suggesting that the

anticipated social interaction did elicit some degree of distress. Another possibility is that

participants may have recognized the impending social interaction as a situational cause of their

momentary NA, limiting its impact on their decision making and goal selection in a way that is

consistent with the affect-as-information hypothesis (e.g., Schwarz & Clore, 1983).[22]

Additionally, it is possible that NA influences judgment and decision making in only a subset of

individuals (e.g., those high in approach motivation; Kramer & Yoon, 2007), making it difficult

to identify simple direct relationships between NA and social goals in a broad participant sample.

Lastly, a number of studies have found that NA is unrelated to sociability (L. A. Clark &

Watson, 1988; Watson, 1988; Watson et al., 1992), suggesting that NA may not be relevant to

social goal selection.

4.1 Positive Affect and Social Avoidance Goals

The inverse relationship between PA and the number of social avoidance goals listed by

participants is consistent with the affect-as-information hypothesis (Clore et al., 2001),

suggesting that participants perceived their momentary PA as feedback regarding their ability to

perform well during the upcoming social interaction, influencing their decision to avoid or not

avoid (i.e., to "stop" or to "go"; Clore et al., 2001). The finding that PA inversely predicted

social avoidance goals while NA was independent of social goals is consistent with Kramer and

Yoon's (2007) observation that PA is used as input in making evaluative judgments regardless of

an individual's motivational tendencies, whereas NA is used only by individuals with a

predominant approach orientation. This suggests that PA may be salient to more people,

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[22] Recall that Schwarz and Clore (1983) found that participants experiencing negative moods were more likely to attribute these moods to salient situational factors, discounting them as reasonable sources of information for making judgments.

including those with social interaction anxiety who have deficits in approach motivation (Kimbrel et al., 2010). This pattern of relationships is also consistent with Schwartz and Clore's (1983) finding that, while participants often "explain away" negative moods, they tend to use positive moods as information in making judgments even when situational explanations are available for their mood. Ultimately, momentary PA may be perceived as a sign that things are going well and that there is little need to focus on avoiding negative outcomes.

The inverse effect of PA on social avoidance goals is also consistent with Fredrickson's (1998) broaden and build model of positive emotions. As discussed above, this model argues that, by broadening thought-action repertoires, PA may loosen the grip that negative emotions have on participants' thinking, allowing them to pursue alternate behavioural strategies (Fredrickson, 1998; Fredrickson & Levenson, 1998). Positive emotions experienced prior to a social interaction may broaden a participant's perspective, allowing them to consider goals other than strict anxious avoidance (i.e., self-protection). The broaden and build model also suggests that, by reducing social avoidance goals, PA may promote the development of enduring relationships and social resources that benefit the individual in both the short and long term (Fredrickson, 1998). This suggests that increasing PA may lead to benefits that extend beyond a reduction in social avoidance goals.

4.2 Summary

Despite taking a fairly exploratory approach to the analyses, the model developed in Study 1 and replicated in Study 2 bears a fairly close resemblance to the original model presented in Figure 2. As predicted, approach and avoidance processes in social anxiety conformed to a hierarchical structure, with higher level motivational tendencies predicting midlevel affective tendencies (i.e., social anxiety) and affective responses (i.e., momentary PA)

72

which, in turn, predicted the adoption of social goals. This hierarchical structure is fairly consistent with the models outlined by Elliot (2006) and Gable (2006), although Gable's (2006) model considers affect to be an outcome of goal pursuit (e.g., Gable & Berkman, 2008) whereas the model investigated in Studies 1 and 2 considers affect to be a situational variable that influences subsequent goal selection. The hierarchical model supported by the present studies suggests a midlevel target for interventions that aim to reduce social avoidance that may be more malleable than either general motivational tendencies or dispositional social interaction anxiety. Study 3 will examine whether a technique designed to increase PA reduces social avoidance goals in socially anxious individuals. This study will also explore potential mediators of these effects.

5 Study 3

Both Studies 1 and 2 support a link between PA and social avoidance goals. This

suggests that it may be possible to decrease social avoidance by increasing PA. It is important to

investigate ways to reduce social avoidance, as avoidance motives and goals have been linked to

a range of negative outcomes, including negative mood, loneliness, decreased social satisfaction,

relationship anxiety, negative attitudes towards social bonds, increased frequency and impact of

negative social events, and increased physical symptoms over time (Elliot et al., 2006; Elliot &

Sheldon, 1998; Gable, 2006; Lench, 2011). Elliot et al. (2006) suggest that the negative focus of

social avoidance goals may "evoke a host of processes likely to degrade the quality of social

interactions and hamper the development of social bonds" (p. 388). In addition, avoidance goals

are associated with processes that may undermine the success of goal pursuit, such as decreased

effort (Sheldon & Elliot, 1999) and increased persistence in the pursuit of unattainable goals

(Lench & Levine, 2008). They are also associated with stronger negative emotional responses to

failure (Lench & Levine, 2008), creating a cycle of negative outcomes and reactions that may

serve to reinforce avoidance patterns. If techniques designed to increase PA are successful at

breaking this cycle and reducing avoidance goals, the benefits of these techniques may be far-

reaching.

PA enhancement may also have a number of benefits in its own right. PA has been linked

to greater social connectedness, positive social support, optimism, adaptive coping, and lower

depression (Steptoe, O'Donnell, Marmot, & Wardle, 2008). PA also has positive implications for

health and has been linked to reduced symptom distress, higher daily functioning, and higher

physical and mental health related quality of life (J. Hu & Gruber, 2008), with meta-analytic

studies supporting a link between positive psychological well-being (including PA) and reduced

mortality in healthy and disease populations (Chida & Steptoe, 2008). A review and meta-analysis of 225 papers also supports a relationship between happiness/PA and increased success in the domains of work, social relationships, and mental and physical health (Lyubomirsky, King, & Diener, 2005). Happiness and PA appear to be important components of a protective psychosocial profile (Steptoe et al., 2008). Further, gains in PA may become self-reinforcing, as happy people tend to think and behave in ways that reinforce their happiness (Boehm & Lyubomirsky, 2009).

5.1 Increasing PA

A number of strategies have been identified that increase positive emotions over short periods of time. Positive emotions have been successfully induced using short video clips designed to elicit contentment or amusement (Fredrickson & Levenson, 1998; Isen & Gorgoglione, 1983), "happy" musical selections (de Jong-Meyer, Kuczmera, & Tripp, 2007; Green, Sedikides, Saltzberg, Wood, & Forzano, 2003; Mongrain & Trambakoulos, 2007), cartoons, picture illustrated emotional texts (Göritz, 2007), statements designed to induce a positive mood (Isen & Gorgoglione, 1983), tasks that involve writing about positive autobiographical events (Shmueli & Prochaska, 2012) or imagining positive events (Holmes, Mathews, Dalgleish, & Mackintosh, 2006), positive imagery (Pictet, Coughtrey, Mathews, & Holmes, 2011), and by giving participants small, unexpected gifts (see Gerrards-Hesse, Spies, & Hesse, 1994, for a review). However, these improvements in mood do not appear to last, as a number of mood induction procedures have been shown to have no discernible effect on mood when affect is measured after a brief intervening task (e.g., Holmes et al., 2006; Isen & Gorgoglione, 1983).

There is, in fact, some degree of skepticism as to whether it is even possible to increase PA over longer periods of time. Much of this skepticism stems from research indicating that a large proportion of the variability in well-being appears to be genetically determined (Lykken & Tellegen, 1996). Indeed, a considerable amount of behavioural genetic research supports the notion of a genetically-determined set point for happiness, suggesting that it may be difficult, if not impossible, to make permanent or long lasting changes to PA (Sheldon & Lyubomirsky, 2004). Another source of skepticism is hedonic adaptation, the process by which people adjust to positive life changes "such that they cease to have positive effects" (Sheldon et al., 2010, p. 39). The hedonic treadmill model argues that, although positive and negative events may temporarily affect happiness, people quickly adapt and return to affective neutrality (Brickman & Campbell, 1971). While revisions to this model suggest that the hedonic set point may not be neutral and that it may be possible to shift this set point (Diener, Lucas, & Scollon, 2006), the existence of a hedonic set point and the process of hedonic adaptation may limit the effectiveness of PA interventions.

Several features of social anxiety may further limit the effectiveness of PA techniques. Social anxiety itself is moderately heritable (Gelernter & Stein, 2009) and is associated with high neuroticism, low extraversion, and childhood behavioural inhibition, personality and temperament variables that have been linked to anxiety and low subjective well-being, happiness, and PA (DeNeve & Cooper, 1998; Kagan, 2003; Kotov, Gamez, Schmidt, & Watson, 2010; Mick & Telch, 1998; Rotge et al., 2011; Watson, Gamez, & Simms, 2005). Social anxiety is also characterized by a range of cognitive processes, collectively known as an "anxiety program", that serve to maintain NA (D. M. Clark & Wells, 1995; Rapee & Heimberg, 1997). Socially anxious individuals show attention biases towards social threat cues, interpret social

information in a more negative way, and overestimate the probability that negative social events will occur and the costs associated with these events relative to non-anxious individuals (Amir & Bomyea, 2010; Foa, Franklin, Perry, & Herbert, 1996; Heinrichs & Hofmann, 2001; McManus, Clark, & Hackmann, 2000; Rheingold, Herbert, & Franklin, 2003; Trew & Alden, 2009; Wenzel & Finstrom, 2007).

To make matters worse, socially anxious individuals also display biases in how they approach positive information, events, and emotions. They show an attention bias away from positive social information (Taylor, Bomyea, & Amir, 2010), are less accurate at detecting positive social reactions (Veljaca & Rapee, 1998), underestimate the probability of positive social events, and interpret these events as more negative and threatening than non-anxious individuals (Alden et al., 2008; Lucock & Salkovskis, 1988; Vassilopoulos, 2006; Voncken, Bogels, & de Vries, 2003). As mentioned above, they also fear positive evaluation and doubt the genuineness of positive reactions to them (Alden et al., 2008; Weeks, Heimberg, Rodebaugh, & Norton, 2008; Weeks, Jakatdar, & Heimberg, 2010), responding to positive social interactions with self-protective social goals, negative emotional states, and the belief that others will have higher expectations for them in the future (Wallace & Alden, 1997). Socially anxious individuals also report that they actively avoid experiencing positive emotions (Taylor, Laposa, & Alden, 2004) and engage in emotion suppression (Kashdan & Steger, 2006) and cognitive processes that dampen PA (Eisner, Johnson, & Carver, 2009). These features of social anxiety may limit the effectiveness of PA techniques by reducing positive engagement and experiences and decreasing the salience of positive cues.

5.1.1 The sustainable happiness model. However, there is reason to believe that lasting improvements in PA are possible, even in the context of social anxiety. The sustainable

happiness model (Lyubomirsky, Sheldon, & Schkade, 2005) argues that three primary factors influence happiness: a genetically determined set point (or set range), life circumstances (e.g., income, marital status), and intentional activities (i.e., cognitive, behavioural, and goal directed activities that people engage in in their daily lives). Whereas genetics are fairly immutable and circumstances are vulnerable to hedonic adaptation due to their typically static nature, activities are voluntary, dynamic, episodic, and changeable, making them more resistant to hedonic adaptation (Lyubomirsky, Sheldon, et al., 2005; Sheldon & Lyubomirsky, 2009). Activities can be developed, varied, timed, and modified to provide a continual stream of fresh and positive experiences, making activity change a promising route to increased happiness and PA (Sheldon & Lyubomirsky, 2004, 2009).

Research has supported the predictions made by the sustainable happiness model. Individuals who had experienced a recent positive activity change reported longer lasting increases in PA, subjective well-being, and happiness relative to those who had experienced recent positive circumstantial changes (Sheldon & Lyubomirsky, 2006a). These participants also reported more varied experiences, whereas participants who had experienced circumstantial changes reported a sense of having "gotten used to" the change (Sheldon & Lyubomirsky, 2006a). This supports the notion that activity changes are more resistant to hedonic adaptation. Additional support for this model comes from an experimental study by Sheldon and Lyubomirsky (2009). In this study, participants who were randomly assigned to change their activities reported a more positive affect balance two weeks later and maintained this increase at four-week follow-up, whereas participants who were instructed to change their circumstances reported an initial improvement but showed a drop in affect balance four weeks later (Sheldon & Lyubomirsky, 2009).

5.1.2 Techniques that increase PA over extended periods of time. A number of interventions have been developed that capitalize on the potential for positive activity changes to improve subjective well-being. Early foundational studies by Fordyce (1977, 1983) demonstrated that it is possible to increase group-level happiness by having participants engage in activities that are highly typical of happy individuals (e.g., spending more time socializing, becoming more present oriented). Fordyce (1977, 1983) noted that the particular activities considered to be the most effective varied between participants and appeared to be determined by the individual's needs and specific areas of weakness. Using fewer activities to target these areas of weakness led to benefits equivalent to the full program (Fordyce, 1983). These increases in happiness were durable, with many participants reporting continued happiness increases nine to 18 months later, particularly when they continued to think about and practice the activities (Fordyce, 1983).

Since this time, numerous activities have been identified that increase happiness, PA, and subjective well-being over extended periods of time. These activities include writing about one's best possible self (Boehm, Lyubomirsky, & Sheldon, 2011; King, 2001; Peters, Flink, Boersma, & Linton, 2010), writing (Boehm et al., 2011) and delivering letters of gratitude (Seligman, Steen, Park, & Peterson, 2005), counting one's blessings (Chan, 2010; Emmons & McCullough, 2003; Lyubomirsky, Sheldon, et al., 2005; Seligman et al., 2005; Sergeant & Mongrain, 2011), using personal strengths in a new way (Seligman et al., 2005), performing novel acts (Buchanan & Bardi, 2010), and writing about satisfaction experiences (Bhullar, Schutte, & Malouff, 2011). Loving kindness meditation (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008), practicing compassion (Mongrain, Chin, & Shapira, 2011), and forgiveness interventions (Lundahl, Taylor, Stevenson, & Roberts, 2008) have also been shown to increase positive emotions and happiness. These improvements in well-being have been shown to persist for up to six months, with higher

maintenance of gains when participants continue to engage in the activity (e.g., Mongrain et al., 2011; Seligman et al., 2005). Clinical applications have also begun to emerge, particularly in the treatment of anxiety and depression (Fava et al., 2005; Fava, Rafanelli, Cazzaro, Conti, & Grandi, 1998; McMakin, Siegle, & Shirk, 2011; Seligman, Rashid, & Parks, 2006). A meta-analysis of 51 studies supports the effectiveness of positive psychology interventions at increasing well-being and PA and decreasing depression (Sin & Lyubomirsky, 2009).

      5.1.3 Performing acts of kindness. One technique that may be particularly effective at increasing PA in socially anxious individuals involves engaging in acts of kindness. Performing kind acts, much like practicing compassion, may increase PA by having participants engage in an activity that gives them a sense of meaning and purpose and represents a positive and valuable influence in other people's lives (Mongrain et al., 2011). Engaging in kind acts may contribute to a more charitable view of others and lead individuals to see themselves as helpful, kind, and caring, improving their self-perceptions and increasing their confidence in their ability to help others (Lyubomirsky, Sheldon, et al., 2005). Engaging in kind acts may also improve mood simply because it feels good to observe the effects of kindness (e.g., the gratitude of others; Kurtz & Lyubomirsky, 2008). In addition, performing kind acts may help to build strong social relationships and foster additional social benefits such as increased social engagement and a broader social network (Kurtz & Lyubomirsky, 2008; Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006). The highly interpersonal nature of kind acts coupled with the positive social reactions that are likely to result, the potential for relationship building, and other social benefits may give acts of kindness the upper hand in breaking through the hedonic barriers of social anxiety, helping to disconfirm social fears.

Helping others and performing acts of kindness have been shown to increase happiness and PA. Participants believe that performing altruistic behaviours will improve their mood (Harris, 1977) and, consistent with this, helping has been shown to improve mood relative to not helping (Harris, 1977; Williamson & Clark, 1989). Altruistic behaviour has been shown to predict PA (but not NA) after controlling for social support and relevant demographic variables (Dulin & Hill, 2003) and spending more of one's income on others, a generous and altruistic behaviour, predicts greater happiness cross-sectionally, longitudinally, and experimentally (Dunn, Aknin, & Norton, 2008). Supporting the affective potency of kind acts, simply counting the number of kind acts performed over a one week period has been shown to increase subjective happiness, with more kind acts associated with larger gains in happiness (Otake et al., 2006).

Instructing participants to perform acts of kindness in their daily lives has also been shown to increase well-being relative to no-activity controls. In a study by Buchanan and Bardi (2010), performing one kind act a day over a ten day period was associated with an increase in life satisfaction relative to controls (Buchanan & Bardi, 2010). Similarly, Lyubomirsky, Sheldon, and Schkade (2005) found that participants who performed acts of kindness over a six week period demonstrated enhanced well-being relative to no-activity controls. These findings suggest that engaging in acts of kindness is an effective well-being intervention.

Interestingly, Lyubomirsky, Sheldon, et al. (2005) found that engaging in acts of kindness only increased well-being when participants performed all five acts of kindness for the week on a single day rather than on different days. The authors suggest that, as many of the kind acts performed by the participants were fairly small, spreading them out over several days may have made them less distinguishable from habitual kind behaviour (Lyubomirsky, Sheldon, et al., 2005). This suggests that the timing of kind acts is important, with massed practice leading to

greater benefits. However, this is inconsistent with Buchanan and Bardi (2010) who found significant changes in life satisfaction when one kind act was performed each day. Given these findings, the optimal timing for engaging in acts of kindness is unclear. Other studies suggest that the variety of the kind acts performed may be more important than their frequency. Sheldon, Boehm, and Lyubomirsky (in press) found that participants who were asked to vary the kind acts that they performed reported greater happiness relative to those who were not given the opportunity to change their kind acts. Engaging in a variety of kind acts may help to counter hedonic adaptation (Kurtz & Lyubomirsky, 2008) and ensure the maintenance of PA gains.

5.2 Increasing PA in Social Interaction Anxiety

A recent study by Alden and Trew (2012) supports the notion that engaging in acts of kindness is an effective way to increase PA in socially anxious individuals. In this study, participants high in social interaction anxiety were randomly assigned to one of three conditions: performing acts of kindness, performing behavioural experiments designed to reduce subtle avoidance behaviours (e.g., not talking, avoiding eye contact), and recording life details (an affectively neutral control condition). Participants in the acts of kindness condition performed three kind acts a day on two days each week and were encouraged to vary the kind acts that they performed. Participants in the behavioural experiments condition performed two behavioural experiments a day (i.e., intentionally engaging in subtle avoidance behaviours in one social interaction and then intentionally dropping these avoidance behaviours in a second interaction to determine whether feared outcomes would occur) on two days each week. Participants in the life details condition recorded three or more events that occurred each day on two days each week. All participants engaged in their assigned activity over a four week period.

Although no change was observed in NA, anxiety, or social approach goals, pre-post and multilevel modelling analyses supported a significantly larger increase in PA/positive mood in the acts of kindness group relative to both of the comparison groups (Alden & Trew, 2012). The acts of kindness group also showed a significantly larger reduction in social avoidance goals at post-intervention relative to the control condition and a marginally larger decrease relative to the behavioural experiments condition. This suggests that increasing PA resulted in a decrease in social avoidance goals. However, change in PA did not mediate the observed reduction in social avoidance goals. In fact, change in these two variables was uncorrelated, both in the full sample and within each task condition.

This study supports the notion that PA techniques (specifically, performing acts of kindness) can be effective in a socially anxious sample. It also supports the notion that PA techniques may help to decrease social avoidance goals. However, given that Alden and Trew (2012) found that these effects were independent of one another, it appears that a third variable (or variables) may mediate the effects of acts of kindness on both PA and social avoidance. Identifying these mediating variables will provide additional insight into the nature of approach and avoidance processes in social interaction anxiety and the relationship between PA and social avoidance goals. It may also point towards additional interventions that will reduce social avoidance.

5.3 Identifying Potential Mediating Variables

Lyubomirsky and her colleagues have identified a number of variables and processes that may mediate the effects of PA techniques and help to explain subsequent changes in PA and social avoidance goals. One such process is the satisfaction of basic psychological needs (Lyubomirsky et al., 2011), particularly the need for relatedness (Sheldon & Lyubomirsky,

2004). Psychological need satisfaction has been linked to a range of positive social and personal outcomes, including well-being (R. M. Ryan & Deci, 2000). By helping to satisfy the need for relatedness, acts of kindness may increase PA and decrease social avoidance. Another way that acts of kindness may influence PA and avoidance goals is by encouraging the development of more positive construals (i.e., perceptions of the self and the social world; Lyubomirsky & Della Porta, 2010). By encouraging more positive self-perceptions (Lyubomirsky, Sheldon, et al., 2005), acts of kindness may increase self-esteem (Anthony, Holmes, & Wood, 2007) and alter subsequent affect and motivation.

Changes to maladaptive negative construals (Kurtz & Lyubomirsky, 2008) may also serve to decrease social anxiety, particularly when coupled with positive social reactions to acts of kindness. Decreases in social anxiety may be highly salient to socially anxious individuals, contributing to changes in affect and social avoidance. Lastly, intentional activities may affect well-being through the accumulation of positive experiences and events (Lyubomirsky & Della Porta, 2010; Lyubomirsky et al., 2011; Lyubomirsky, Sheldon, et al., 2005). The interpersonal nature of kind acts and the social benefits that result (Kurtz & Lyubomirsky, 2008; Otake et al., 2006) may increase engagement in positive social activities as relationships deepen and social networks expand. These positive social activities may have a particularly strong impact on both PA and avoidance in social anxiety, helping to disconfirm social fears. Each of these variables – the satisfaction of relatedness needs, self-esteem, social anxiety, and positive social activities – will be explored in turn for their potential role in mediating the effects of acts of kindness.

5.3.1 Relatedness need satisfaction. Deci and Ryan's (1985, 2000) self-determination theory argues that humans have three innate psychological needs – autonomy, competence, and relatedness – that yield enhanced intrinsic motivation, mental health, and well-being when

satisfied and diminished motivation and well-being when thwarted (R. M. Ryan & Deci, 2000).

The need for relatedness refers to the desire to feel close and connected to significant others

(Deci & Ryan, 2000) and is closely related to Baumeister and Leary's (1995) proposed need for

belongingness. As mentioned above, the satisfaction of basic psychological needs is thought to

mediate the effects of positive activities on well-being (Sheldon et al., 2010; Sheldon &

Lyubomirsky, 2004). Kind acts are specifically thought to satisfy basic needs for relatedness by

enhancing feelings of cooperation and interdependence (Lyubomirsky, Sheldon, et al., 2005;

Sheldon & Lyubomirsky, 2004). In satisfying these relatedness needs, kind acts may affect

subsequent PA and motivation.

       Relatedness need satisfaction is argued to promote higher levels of PA through the

formation of social bonds, with PA, in turn, helping to solidify social attachment (Baumeister &

Leary, 1995). Consistent with this, relatedness need satisfaction has been linked to concurrent

and future PA in children and adolescents (Véronneau, Koestner, & Abela, 2005) and has been

shown to predict concurrent PA in an adult group context (Sheldon & Bettencourt, 2002). In a

daily monitoring study by Reis, Sheldon, Gable, Roscoe, and Ryan (2000), daily satisfaction of

relatedness needs and trait-level feelings of connectedness were associated with higher daily PA

and well-being. Similarly, daily satisfaction of relatedness needs has been shown to correlate

with daily PA, with hour-by-hour ratings of relatedness need satisfaction predicting momentary

happiness (Howell, Chenot, Hill, & Howell, 2011). Experimental studies also support a link

between relatedness need satisfaction and PA. In a four-wave, six month longitudinal study,

Sheldon et al. (2010) found that goal progress was more strongly related to well-being in

participants who were randomly assigned to set goals to increase their feelings of autonomy,

competence, or relatedness relative to those who set goals to change their circumstances.

Progress towards relatedness goals showed a particularly strong relationship with well-being six

months after the intervention (Sheldon et al., 2010). These studies support a strong link between

relatedness need satisfaction and measures of well-being, including PA.

Need satisfaction has also been conceptually and empirically linked to avoidance. Deci

and Ryan (2000) argue that a full understanding of goal-directed behaviour, psychological

development, and well-being requires an understanding of the basic needs that energize and

direct goals. The need for relatedness may help to explain social avoidance and withdrawal, as

people may engage in these behaviours in an attempt to reduce the risk of saying or doing

something that may be regarded as negative and lead to rejection, thwarting the satisfaction of

relatedness needs (Baumeister & Leary, 1995). If, however, an individual perceives that their

basic needs are being supported, they will feel more satisfied and at ease and will worry less

about protecting their self-worth (Betoret & Artiga, 2011). On an empirical level, the satisfaction

of basic needs, including relatedness and belonging, has been linked to the decreased use of

avoidance strategies in learning (Betoret & Artiga, 2011). By helping to satisfy relatedness

needs, kind acts may also help to reduce self-protective avoidance goals.

5.3.2 Self-esteem. Self-esteem has been defined as one's overall appraisal of their worth

or value as an individual (Rosenberg, 1965). Changes in self-esteem may mediate the

relationship between acts of kindness and changes in PA and social avoidance. This may be

particularly true in the context of social anxiety, as it has been argued that the relationship

between social anxiety and positive psychological functioning may be, in part, a function of self-

esteem (Kashdan, 2002). As noted above, engaging in acts of kindness may increase happiness

by changing self-perceptions, allowing individuals to see themselves as altruistic, helpful, kind,

and capable (Kurtz & Lyubomirsky, 2008) and "as encompassing culturally valued qualities"

(Mongrain et al., 2011, p. 977). This is in line with self-perception theory (Bem, 1972) which

argues that people's attitudes towards themselves are based on observations of their own

behaviour. Improved self-perceptions may manifest as increased self-esteem, as self-esteem has

been found to correlate with perceptions of the self as having positive communal qualities such

as kindness (Anthony et al., 2007).

Engaging in kind acts may also enhance self-esteem by creating conditions that increase

one's social appeal (Mongrain et al., 2011). The sociometer model of self-esteem (Leary,

Tambor, Terdal, & Downs, 1995) argues that self-esteem serves as a gauge of interpersonal

relationships, monitoring one's social acceptance and prompting behaviour that is likely to

maintain connections with others. In this context, anticipating and perceiving others'

appreciation and positive reactions in response to kind acts may improve self-esteem, with

subsequent changes in affect and behaviour. Consistent with this, previous studies have found

that helping was associated with improved mood and self-evaluations relative to performing the

same task when it was not perceived as helping, with changes in mood thought to follow changes

in self-evaluation (Williamson & Clark, 1989).

Self-esteem is, in turn, highly correlated with measures of happiness, positive mood, and

PA (e.g., Cheng & Furnham, 2003a; Furr, 2005; Williamson & Clark, 1989). Indeed, the strength

of these relationships is often so high that several studies have examined the independence of

these constructs, concluding that self-esteem is indeed distinct from happiness and PA (Furr,

2005; Lyubomirsky, Tkach, & DiMatteo, 2006). Self-esteem has been shown to predict

happiness, even after controlling for attributional style (Cheng & Furnham, 2003b), and has been

shown to mediate the relationship between personality variables (i.e., extraversion and

neuroticism) and happiness (Cheng & Furnham, 2003a). A comprehensive literature review

conducted by Baumeister, Campbell, Krueger, and Vohs (2003) found uniform support for a strong relationship between self-esteem and happiness, with meta-analyses providing additional support for a relationship between self-esteem and well-being (e.g., DeNeve & Cooper, 1998).

Self-esteem has also been conceptually and empirically linked to social avoidance, with some arguing that self-esteem may mediate the relationship between underlying motivational tendencies and approach and avoidance goals (Park, 2010). Whereas high self-esteem is associated with self-enhancement tendencies that promote approach, the negative self-beliefs and self-protective tendencies associated with low self-esteem may promote the adoption of avoidance goals (Heimpel et al., 2006). In the social realm, avoidance goals may be adopted in an effort to prevent rejection and further loss of self-esteem and to avoid reductions in social status (Anthony et al., 2007; Park, 2010). Consistent with this, Geist and Borecki (1982) have argued that, whereas high self-esteem may allow individuals to perceive social situations as less threatening and encourage social approach, low self-esteem may decrease confidence in the ability to interact with others, leading to social avoidance. In the end, the lower an individual's self-esteem, the greater the probability that they will adopt avoidance (relative to approach) goals (Heimpel et al., 2006).

The empirical literature supports these claims. Self-esteem has been found to correlate with measures of social avoidance (Geist & Borecki, 1982; Ishiyama, 1999) and inversely predicts avoidance (relative to approach) goals, even after controlling for social desirability (Heimpel et al., 2006). Self-esteem has also been found to mediate the relationship between motivational tendencies and personality variables and the adoption of avoidance (relative to approach) goals (Heimpel et al., 2006). Further, Elliot, Sheldon, and Church (1997) found that low perceptions of personal life skills were associated with the adoption of avoidance goals, with

avoidance goals, in turn, predicting lower retrospective and longitudinal subjective well-being. Ultimately, the pursuit of avoidance goals may represent an important mechanism through which self-esteem influences adjustment (Heimpel et al., 2006).

        5.3.3 State-level social anxiety. Changes in state-level social anxiety may also mediate the effect of acts of kindness on PA and social avoidance.[23] Although it does not appear that any research studies have directly examined whether PA techniques reduce social anxiety, there is reason to believe that change in social anxiety is possible. As noted above, positive activities may improve well-being by combating negative construals and changing how people perceive their situation for the better (Lyubomirsky & Dickerhoof, 2010). If engaging in kind acts is effective at changing maladaptive social construals, this may reduce social anxiety by decreasing perceptions of social threat. Several researchers have advocated the use of PA techniques in the treatment of social anxiety. For example, Kashdan (2004) has suggested that increasing pleasant activities may increase the benefits associated with exposure based treatments while Hofmann, Grossman, and Hinton (2011) have suggested that loving kindness and compassion meditation may similarly improve treatment outcomes. Although Alden and Trew (2012) found that engaging in acts of kindness did not change NA or anxiety, it is important to note that this study used a single item measure of anxiety and did not directly assess state-level social anxiety. Anxiety reduction may be an important mechanism underlying the effectiveness of acts of kindness.

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[23] A distinction is made here between state-level social anxiety, that is, the level of social anxiety that an individual is experiencing at the present moment, and dispositional social anxiety which refers to more longstanding and enduring symptoms of social anxiety. Changes in state-level social anxiety are more likely to be apparent during a short term intervention than changes in dispositional social anxiety, as dispositional social anxiety is often assessed using a much longer time frame (i.e., symptoms experienced over the past month or "in general" vs. the past few days).

As discussed in detail above, social anxiety has been linked to both PA deficits (e.g., Alden et al., 2008; T. A. Brown et al., 1998; Chorpita et al., 2000; Hughes et al., 2006; Hughes & Kendall, 2009; Kashdan, 2004; Kashdan & Roberts, 2006; Kashdan & Steger, 2006; Watson, Clark, & Carey, 1988) and social avoidance tendencies (e.g., Ishiyama, 1999; Leary et al., 1986; Meleshko & Alden, 1993; Rodebaugh, 2007). In addition, there is some support for the notion that social anxiety reduction may mediate changes in affect and motivation. Changes in social anxiety during treatment were found to fully mediate changes in depression (Moscovitch, Hofmann, Suvak, & In-Albon, 2005), a condition that is characterized by low PA (e.g., Watson, Clark, & Carey, 1988) and avoidance (Trew, 2011), whereas the reverse pathway was not supported. In addition, anxiety symptoms have been conceptually linked to subsequent escape and avoidance (Otto & Safren, 2001). It is plausible that changes in social anxiety will lead to corresponding changes in PA and social avoidance goals.

5.3.4 Positive social activities. Lastly, the frequency of positive social activities will be investigated for its potential mediating role in the effects of engaging in acts of kindness. Lyubomirsky's research team has noted that positive activities often result in positive experiences (e.g., Lyubomirsky & Della Porta, 2010). Acts of kindness are socially engaging and often require direct interaction with people that you may never otherwise meet or get to know, creating opportunities to develop new relationships (Kurtz & Lyubomirsky, 2008). As kindness is seen as desirable and important across relationship types (Sprecher & Regan, 2002) and the recipient often experiences positive feelings and a sense of connectedness towards their benefactor (Algoe & Haidt, 2009), kind acts may lead to positive reactions from others (e.g., C. T. Tkach, 2006). Being kind to someone also increases liking of the recipient (Schopler & Compere, 1971). These reactions may increase the potential for future social interactions which,

in turn, may enhance PA and reduce social avoidance. Although Alden and Trew (2012) found that acts of kindness did not increase social activity, it is important to note that this study used a single item measure of social activity (i.e., '*On how many days in the past week did you engage in social activities/interactions?*'). It is possible that increases in positive social activity may be detected with a more comprehensive measure.

Social activity and affiliation have been linked to PA and happiness in numerous cross sectional, longitudinal, and experience sampling studies (e.g., Berry & Hansen, 1996; L. H. Brown, Strauman, Barrantes-Vidal, Silvia, & Kwapil, 2011; Csikszentmihalyi & Hunter, 2003; Graney, 1975; Lucas & Dyrenforth, 2006; Lucas, Le, & Dyrenforth, 2008; Lyubomirsky et al., 2006). Highly sociable people are more likely to experience pleasant moods than those who are less sociable (Emmons & Diener, 1986), with social activity and affiliation partially mediating the relationship between personality traits and both PA and happiness (Lucas et al., 2008; C. Tkach & Lyubomirsky, 2006). Social affiliation is the most frequently endorsed strategy for increasing happiness and it appears to be effective at doing just that (Fordyce, 1977, 1983; C. Tkach & Lyubomirsky, 2006). Participating in enjoyable social activities is related to higher daily well-being, higher PA, higher vitality, and lower NA independent of relatedness, suggesting that, although pleasant social activities may enhance feelings of relatedness, they are also beneficial in their own right (Reis et al., 2000). Experience sampling studies have supported an events-to-affect pathway linking the frequency and importance of positive social events to daily PA (Gable et al., 2000). This supports the notion that increased positive social activities may lead to beneficial changes in affect.

Positive social activities may also help to decrease social avoidance goals. Gazelle and Rudolph (2004) have suggested that positive social cues such as peer inclusion may reduce social

avoidance by disconfirming social fears. In the absence of peer exclusion, anxious solitary youth

were found to engage in more social approach and less social avoidance over time (Gazelle &

Rudolph, 2004), suggesting that normal social experiences can promote a shift away from

avoidance. Positive social activities may also decrease avoidance by increasing social self-

efficacy. In support of this notion, social activity has been linked to increased social self-efficacy

(Connolly, White, Stevens, & Burstein, 1987; cf. Wallace & Alden, 1997) which, in turn, has

been linked to decreased social inhibition and avoidance (Innes & Thomas, 1989).

5.4 Present Study

The present study sought to replicate Alden and Trew's (2012) findings by examining the

effects of engaging in acts of kindness on PA and social avoidance goals. It also examined the

satisfaction of relatedness needs, self-esteem, state-level social anxiety, and the frequency of

positive social activities as potential mediators of these effects. Participants were assessed at pre-

and post-intervention. In addition, state affect (i.e., PA and NA), social approach and avoidance

goals, and state-level social anxiety were assessed on a twice-weekly basis throughout the study

to help clarify the pattern of change in these variables over time.

A critical issue in evaluating the acts of kindness condition is whether this PA technique

is more effective at decreasing social avoidance goals relative to a strategy that is specifically

designed to target avoidance. Although Alden and Trew (2012) found that performing acts of

kindness was slightly more effective at reducing social avoidance goals than engaging in

behavioural experiments, a technique that targets NA and subtle avoidance tendencies, it is

important to note that this avoidance reduction strategy is fairly complex. Conducting

behavioural experiments involves identifying habitual subtle avoidance behaviours and

experimenting with both using and not using these avoidance behaviours in order to determine

whether feared outcomes occur. In a clinical context, these behavioural experiments would be conducted over an extended period of time with considerable therapist guidance (Alden & Trew, 2012). It is possible that this condition was not effective at reducing social avoidance goals because it was implemented incorrectly by participants. The present study will address this limitation by comparing acts of kindness to a more straightforward avoidance reduction strategy: graduated social exposure.

Graduated exposure directly targets fear and avoidance through the intentional confrontation of increasingly feared but otherwise safe stimuli (e.g., social interactions) with the goal of reducing fear and other negative reactions (Foa, 2011). Under traditional conceptualizations of graduated exposure, sufficient exposure to evocative cues is thought to lead to habituation, where the level of experienced distress decreases gradually over time (McNally, 2007). This habituation weakens the association between the stimulus and the fear response (McNally, 2007). Under more recent cognitive conceptualizations of graduated exposure, confronting feared stimuli and eliminating avoidance is thought to generate information about the consequences of approaching the stimuli that contradicts existing beliefs and expectations, disconfirming threat perceptions and encouraging more adaptive construals (Foa, 2011). Meta-analyses have found that exposure interventions yield moderate to large effect sizes in the treatment of social anxiety (Feske & Chambless, 1995; Gould, Buckminster, Pollack, Otto, & Yap, 1997). In addition, several recent studies have supported the effectiveness of self-directed exposure with minimal therapist contact for anxiety disorders (Kenwright, Marks, Gega, & Mataix-Cols, 2004; Marks, Kenwright, McDonough, Whittaker, & Mataix-Cols, 2004; Schneider, Mataix-Cols, Marks, & Bachofen, 2005), with a self-help program for social anxiety that included graduated exposure yielding effect sizes comparable to traditional cognitive

behavioural therapy (CBT) in a student sample (Tillfors et al., 2008). Although it is important to acknowledge that some studies have found that self-help programs have limited efficacy in the treatment of social phobia in community based clinical samples (Rapee, Abbott, Baillie, & Gaston, 2007), this research provides some support for the effectiveness of self-directed exposure for social anxiety in undergraduate samples.

Exposure may produce changes in both affect and motivated behaviour. Given the relationship between social anxiety and both NA and PA (e.g., Hughes & Kendall, 2009; Kashdan & Roberts, 2006; Kashdan & Steger, 2006; Watson, Clark, & Carey, 1988), decreasing social anxiety as a result of graduated exposure (e.g., Mattick & Peters, 1988; Mattick, Peters, & Clarke, 1989) may lead to corresponding changes in affect. Although few studies have investigated the impact of graduated exposure on NA and PA specifically, there is some indication that the treatment of social anxiety may lead to a significant reduction in NA with no corresponding change in PA (Courbasson & Nishikawa, 2010). Guided exposure has also been shown to increase behavioural approach and decrease self-reported social avoidance (e.g., Mattick & Peters, 1988; Mattick et al., 1989) and behavioural avoidance during a speech task (Hofmann, Moscovitch, Kim, & Taylor, 2004), supporting an effect on social approach and avoidance.

Graduated social exposure may also increase feelings of relatedness to the extent that individuals engage in social interactions that involve spending time with others, doing pleasant or fun things, talking about something meaningful, or feeling understood and appreciated (Reis et al., 2000). Further, by increasing the number of social interactions that participants engage in, exposure may increase daily self-esteem (Denissen, Penke, Schmitt, & van Aken, 2008). Consistent with this, a study by Olivares et al. (2002) found that two out of three active

treatments for social anxiety, all of which included graduated exposure, increased self-esteem in adolescents. By encouraging more social interaction, social exposure is also likely to promote an increase in positive social activity, further contributing to well-being. This is consistent with research demonstrating an increase in social interaction following a behavioural treatment for social anxiety that included social exposure (Beidel, Turner, & Morris, 2000).

Including a self-directed analogue of graduated social exposure (i.e., decreasing social avoidance) as a comparison condition in the present study will help to establish whether the benefits associated with engaging in kind acts exceed the benefits associated with directly reducing social avoidance by engaging in more social interactions. Studies by Fava's research team (Fava et al., 2005, 1998) have suggested that well-being interventions are comparable to standard CBT at reducing symptoms of anxiety and depression and improving well-being. This study will provide an additional test of the relative superiority of PA techniques and avoidance reduction strategies with respect to a range of outcome variables. The decreasing social avoidance (SA) condition will also provide an active control for the effects of increasing the frequency of social contact, engaging in an unfamiliar activity, expectancy, and demand.

5.5 Summary and Hypotheses

The relationship between PA and social avoidance goals found in Studies 1 and 2 suggests that efforts to increase PA may help to reduce social avoidance. If PA techniques can be harnessed to alter the balance of approach and avoidance, they may prove to be a valuable addition to current treatment protocols for social anxiety, increasing the likelihood that socially anxious individuals will experience the benefits associated with social approach and close interpersonal relationships. A number of techniques have been identified that create both short term (e.g., Fredrickson & Levenson, 1998) and lasting increases in PA (e.g., Lyubomirsky,

Sheldon, et al., 2005). The effectiveness of one of these techniques (i.e., performing acts of kindness) has been established in individuals with social interaction anxiety (Alden & Trew, 2012). Further, this study found that increases in PA were accompanied by a reduction in social avoidance goals, suggesting that PA techniques do indeed reduce social avoidance tendencies. However, change in PA was uncorrelated with change in social avoidance goals (Alden & Trew, 2012). This suggests that additional variables mediate the effects of performing kind acts on PA and social avoidance. The present study investigates four such variables: the satisfaction of relatedness needs, self-esteem, state-level social anxiety, and the frequency of positive social interactions. It also evaluates the effectiveness of performing acts of kindness relative to SA, a self-directed analogue of graduated social exposure that is specifically designed to decrease avoidance.

Based on Alden and Trew's (2012) findings and the literature reviewed above, it is hypothesized that engaging in acts of kindness will increase PA and decrease social avoidance goals relative to a neutral control activity (i.e., recording life details). Performing acts of kindness is not expected to change NA (Alden & Trew, 2012). This is consistent with several studies finding that positive activity changes, PA techniques, and altruistic behaviour are not associated with NA (Chan, 2010; Dulin & Hill, 2003; Sheldon & Lyubomirsky, 2006a). Also based on Alden and Trew (2012), performing acts of kindness is not expected to change social approach goals. SA, on the other hand, is expected to increase social approach goals, decrease social avoidance goals (Mattick & Peters, 1988; Mattick et al., 1989) and decrease NA (Courbasson & Nishikawa, 2010) relative to recording life details. Based on previous findings (Courbasson & Nishikawa, 2010), SA is not expected to change PA, although the relationship between social anxiety and PA deficits suggests that this is a possibility (e.g., Kashdan, 2004;

Watson, Clark, & Carey, 1988). It is anticipated that these effects will be apparent in the analyses of both the pre- and post-intervention measures and the twice-weekly assessments. No specific hypotheses are advanced regarding the relative superiority of engaging in acts of kindness and SA.

As the potential mediator variables included in this study are largely exploratory, all hypotheses regarding these variables are necessarily tentative. The literature reviewed above suggests that engaging in acts of kindness may increase feelings of relatedness, increase self-esteem, decrease social anxiety, and increase positive social activities. This literature also suggests that SA may have similar effects on relatedness need satisfaction, self-esteem, social anxiety, and positive social activities. Changes in these variables are expected to predict (i.e., mediate) any observed changes in affect and motivation. It is anticipated that changes in state-level social anxiety will be apparent in both the pre-post analysis and the analysis of the twice-weekly assessments.[24]

5.6 Specific Contributions

This study contributes to the literature by seeking to replicate Alden and Trew's (2012) findings and examining the effects of performing acts of kindness on PA and social avoidance goals in a socially anxious sample. Further, it extends these findings by examining several potential mediators of these effects. Given that few (if any) studies have directly examined the effects of performing kind acts on the satisfaction of relatedness needs, self-esteem, social anxiety, and the frequency of positive social activities, this study will help to establish whether acts of kindness may have broader effects and will help to clarify the processes associated with affective and motivational change.

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[24] To minimize participant burden and increase compliance with the twice-weekly online assessments, relatedness need satisfaction, self-esteem, and the frequency of positive social activities were assessed at pre- and post-intervention only.

This study also extends Alden and Trew's (2012) findings by examining whether SA, an analogue of graduated social exposure, results in similar changes on the study variables. While previous studies have linked exposure to changes in affect, motivation, and social anxiety, few (if any) studies have directly examined whether exposure leads to changes in relatedness need satisfaction, self-esteem, and the frequency of positive social activities. By evaluating these outcomes, the present study will help to establish whether social exposure has positive effects in these areas. Lastly, this study extends Alden and Trew's (2012) findings by evaluating change in social approach and avoidance goals and social anxiety over time using twice-weekly online assessments, helping to clarify the trajectory of any observed changes in motivation and anxiety. Ultimately, this study will help to further clarify the relationship between PA and social avoidance, determine whether (and why) increasing PA is an effective avoidance reduction strategy, and help to establish the range of benefits associated with engaging in acts of kindness and graduated social exposure.

5.7 Method

5.7.1 Preliminary power analyses. Prior to collecting the participant sample for Study 3, a power analysis was conducted to determine the approximate number of participants that would be required to replicate the findings obtained in Alden and Trew (2012). This power analysis was conducted using G*Power version 3.1.3 (Erdfelder, Faul, & Buchner, 1996). As only two out of the three conditions used in the present study were used by Alden and Trew (2012), this power analysis focused on the comparison between the PA technique and the control condition. This power analysis revealed that, in order to have .80 power to detect an effect size of $d = 0.54$ for PA with a two-tailed hypothesis test, 56 participants would be required in each

group.[25] To have .80 power to detect an effect size of $d = 0.50$ for social avoidance goals with a two-tailed test, 65 participants would be required in each group.[26] Given that the aim of the present study is to replicate the effects observed by Alden and Trew (2012), directional hypothesis tests are appropriate. However, to maximize the potential to detect unanticipated effects, two-tailed tests were used.

      5.7.2 Participants. As the primary aim of this dissertation is to explore approach and avoidance processes in social interaction anxiety, a large sample of undergraduate students high in social interaction anxiety were recruited for this study. Participant recruitment was conducted over two academic terms. During the first term, 663 participants completed the SIAS. Participants scoring 34 or higher on the SIAS, a commonly used clinical cut-off (Heimberg et al., 1992), were invited to participate in the study. Of 172 eligible participants, 75 attended the initial laboratory session (a response rate of 43.86%). Participants who attended the initial laboratory session did not differ in their SIAS scores from those who declined ($M = 44.16$, $SD = 9.46$ vs. $M = 43.41$, $SD = 7.33$, $t(170) = -0.58$, $p = .56$, $d = 0.09$). During the second term, the use of an automated pre-screening system necessitated removal of the reverse scored items from the SIAS. This reduced measure, commonly referred to as the SIAS-Straightforward (or SIAS-S), has been shown to have psychometric properties and convergent validity comparable to the original measure (Rodebaugh, Woods, & Heimberg, 2007). A total of 999 participants completed the SIAS-S as part of the screening process. Participants with a score of 25 or higher on the SIAS-S were invited to participate. This cut-off was based on findings by Rodebaugh et al. (2006) indicating that 25 was the lowest score on the SIAS-S that corresponded to a score of 34 on the full SIAS in a large archival dataset that included both student and clinical data. Of 265 eligible

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[25] 44 participants would be required in each group for a one-tailed hypothesis test.

[26] 52 participants would be required in each group for a one-tailed hypothesis test.

participants, 71 attended the initial laboratory session (a response rate of 26.42%). This lower response rate (relative to the first term) is likely attributable to the participants' decreased familiarity with the study (i.e., pre-screening was not specific to this study) and the inability to contact participants by telephone. As in the first term, the participants who agreed to attend the initial laboratory session did not differ in their SIAS-S scores from those who were eligible but declined ($M = 34.12$, $SD = 7.61$ vs. $M = 35.75$, $SD = 8.61$, $t(263) = 1.38$, $p = .17$, $d = 0.19$).

In total, 146 participants attended the initial laboratory session (73.97% female; mean age = 20.47, $SD = 3.66$; mean years of university completed = 2.11, $SD = 1.60$). Fifty-five participants identified themselves as being of European descent, 67 as being of Asian descent, six as being of Indo-Canadian descent, three as First Nations Canadian, and 15 as being of "other" cultural descent. All participants had at least 10 years of experience speaking English.

As SIAS scores can demonstrate considerable regression towards the mean across multiple administrations, participant scores on the SIAS during the initial laboratory session were examined to ensure that participants were, in fact, high in social interaction anxiety. Participants scoring 29 or higher on the full SIAS during the initial laboratory session were included in the analyses. A cut-off of 29 was selected as previous studies have suggested that the standard clinical cut-off of 34 (Heimberg et al., 1992) may be overly conservative in analogue samples, with students being less likely to meet a cut-off of 34 despite experiencing clinically significant levels of social anxiety (Rodebaugh et al., 2006). In addition, 29 was the lowest pre-screening SIAS score included in Alden and Trew's (2012) study. This score exceeds the mean SIAS score from the pre-screening sample in the first term, $M = 27.91$, $SD = 14.04$, supporting relatively high levels of social interaction anxiety in the sample used in the main analyses. This secondary screening process resulted in the exclusion of 23 participants. One additional

participant was excluded due to known issues with task compliance. The mean SIAS score in the final sample, $M = 43.39$, $SD = 9.39$, exceeded Heimberg et al.'s (1992) recommended clinical cut-off and was significantly higher than the mean pre-screening SIAS score reported by Alden and Trew (2012), $M = 39.65$, $SD = 8.29$, $t(262) = 3.44$, $p < .001$, $d = 0.42$. The final sample consisted of 115 participants high in social interaction anxiety.

Based on the power analyses described above, this study is somewhat underpowered. The estimated power to detect an effect size of $d = 0.54$ for PA with a two-tailed test and sample sizes of 38 and 36 for the PA and control conditions is .63.[27] The estimated power to detect an effect size of $d = 0.50$ for social avoidance goals with a two-tailed test is 0.56.[28] Although these power estimates are far from optimal, it is important to note that the relatively small sample size in the present study resulted from imposing stricter selection criteria that ensured a more socially anxious sample. Selecting a more anxious sample may help to offset some of the power loss caused by the smaller sample size by increasing the potential for change in both PA and social avoidance goals.

5.7.3 Measures. Several measures from Studies 1 and 2 were used in Study 3, including the SIAS (Mattick & Clarke, 1998) and the PANAS (Watson, Clark, & Tellegen, 1988). Consistent with Alden and Trew (2012), participants were asked to complete the PANAS with respect to how they had felt "over the past few days". Cronbach's alpha values in the present study ranged from .83 to .89 for the SIAS, from .87 to .89 for the PA scale of the PANAS, and from .86 to .89 for the NA scale of the PANAS. Cronbach's alpha for the SIAS-S, used during pre-screening, was .78. Several additional measures were used, including:

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[27] The estimated power for a one-tailed test is .74.

[28] The estimated power for a one-tailed test is .68.

5.7.3.1 Social goals questionnaire (SGQ; Meleshko & Alden, 1993)***.*** The SGQ is a 10-item nomothetic measure of general social approach and avoidance goals that is based on previous research by Meleshko and Alden (1993). A nomothetic measure of social goals was selected for the present study as the nature of the idiographic Social Goals Elicitation Procedure used in Studies 1 and 2 makes it difficult to obtain a pre-intervention measure of social goals (i.e., the plausibility of the anticipated social interaction is likely to decrease by the second administration). The SGQ includes five items assessing social approach goals and five items assessing social avoidance goals. Participants were asked to indicate the extent to which they held specific approach and avoidance goals during social interactions in the past month using a seven-point scale (1 = Not at all, 7 = Very much). Examples of approach items include '*Talk openly about myself*' and '*Get to know the person I was talking to*'. Examples of avoidance items include '*Not show signs of anxiety*' and '*Not appear foolish*'. Examination of the content of the SGQ items reveals that the majority of the items would be considered to be prosocial approach or anxious avoidance goals under the goal coding system used in Studies 1 and 2. Cronbach's alphas in the present study ranged from .66 to .71 for the approach scale and from .69 to .84 for the avoidance scale.

5.7.3.2 Basic psychological needs scale – relatedness (BPNS-R; Gagné, 2003). The BPNS-R is part of a family of scales assessing the satisfaction of the three basic needs outlined by Deci and Ryan (1985, 2000): autonomy, competence, and relatedness. There are separate subscales for relatedness (eight items assessing feelings of meaningful connectedness with others), competence (six items assessing feelings of efficacy in one's activities), and autonomy (seven items assessing the feeling that one's choices and activities are self-determined). Items are rated on a seven-point scale (1 = Not at all true, 7 = Very true). The relatedness subscale was

used in the present study. This scale has excellent psychometric properties, including adequate to high internal consistency (Ilardi, Leone, Kasser, & Ryan, 1993; Kashdan, Julian, Merritt, & Uswatte, 2006; Kasser, Davey, & Ryan, 1992), and predicts prosocial engagement (Gagné, 2003), demonstrating its relevance to adaptive social behaviour. Cronbach's alphas in the present study ranged from .77 to .78.

5.7.3.3 Rosenberg self-esteem scale (RSES; Rosenberg, 1989). The RSES is one of the most widely used measures of global self-esteem, with self-esteem defined, as described above, as one's overall evaluation of their worth or value as an individual (Rosenberg, 1965). The RSES includes 10-items, five of which are positively worded and five that are negatively worded. In the present study, responses were made on a seven-point scale (1 = Strongly disagree, 7 = Strongly agree). The RSES shows high internal consistency. Negative correlations with measures of depression, anxiety, and stress and positive correlations with mental and physical well-being support the construct validity of this measure (Sinclair et al., 2010). Cronbach's alphas in the present study ranged from .90 to .91.

5.7.3.4 Daily social anxiety (DSA; Kashdan & Steger, 2006). As the SIAS measures enduring symptoms of dispositional social anxiety (Mattick & Clarke, 1998), a state measure of social anxiety was selected for the present study to maximize the potential to detect subtle short term changes in social anxiety. This measure was designed for an experience sampling study conducted by Kashdan and Steger (2006). The DSA includes seven items assessing social anxiety experienced over the past few days, with responses made on a five-point scale (1 = Very slightly/not at all, 5 = Extremely). Factor analyses support a one-factor solution for this scale, with HLM analyses indicating that it has acceptable reliability (Kashdan & Steger, 2006). Further, the DSA correlates significantly with measures of trait social anxiety, even after

controlling for depression and trait NA, supporting strong convergent validity (Kashdan &

Steger, 2006). Cronbach's alphas in the present study ranged from .84 to .91.

     5.7.3.5 Interpersonal outcomes scales (IOS; Alden & Taylor, 2004). The IOS is a 21-

item measure that assesses positive social functioning, reflecting the types of social functioning

that are often deficient in socially anxious individuals. Separate subscales measure social

approach (i.e., the frequency of engaging in various positive social activities), relationship

satisfaction (i.e., satisfaction with various types of relationships), and perceived social support.

In the present study, the social approach scale (11 items) was used to assess the frequency of

positive social interactions over the past month. Responses are made using a seven-point scale (1

= Not at all, 7 = Often). The social approach scale of the IOS has good internal consistency in

both student and clinical samples and shows acceptable test-retest reliability ($r = .76$; Alden &

Taylor, 2011). In support of the construct validity of this measure, the social approach scale

correlates positively with PA but not with NA during social interactions and correlates positively

with social approach but not social avoidance goals, supporting the notion that this subscale

reflects positive social functioning and is relevant to social approach motivation (Alden &

Taylor, 2011). Cronbach's alphas in the present study ranged from .86 to .87.

     5.7.3.6 Online report forms. Online report forms were developed to track participant

compliance, affect, social anxiety, and social approach and avoidance goals over the course of

the study. Participants were asked to indicate whether they were able to complete their assigned

activity over the past few days, on which days they completed the activity, and whether they had

been able to complete three acts of kindness/social interactions or record three life details on

each of the days that they completed the activity. Participants also completed the SGQ, described

above, with the instructions modified to assess social goals over "the past few days". Cronbach's

alphas for the SGQ used in the email report forms ranged from .56 to .82 for approach goals and from .74 to .87 for avoidance goals. Participants also completed the DSA, described above, also with respect to "the past few days", with Cronbach's alphas ranging from .89 to .92. In addition, participants completed brief measures of affect:

5.7.3.7 *International positive and negative affect schedule – short form* (I-PANAS-SF; Thompson, 2007). The I-PANAS-SF is a 10-item measure of PA and NA composed of items from the PANAS (Watson, Clark, & Tellegen, 1988), with five items measuring PA and five items measuring NA. Responses are made on a five-point scale (1 = Never, 5 = Always). This short form of the PANAS was designed to comprehensively reflect the affective content contained in the PANAS while exhibiting strong psychometric qualities and cross-national structural equivalence (Thompson, 2007). These scales correlate highly with the PA and NA scales from the full PANAS, with a correlation of .92 for PA as measured by the I-PANAS-SF (I-PA-SF) and .95 for NA as measured by the I-PANAS-SF (I-NA-SF). The I-PANAS-SF shows adequate internal consistency and temporal stability, with eight week test-retest correlations of .84 for both I-PA-SF and I-NA-SF (Thompson, 2007). In support of the convergent validity of the I-PANAS-SF, I-PA-SF was found to correlate with measures of happiness and subjective well-being whereas I-NA-SF correlated negatively with these measures. This scale showed measurement and factor invariance across native and non-native English speakers (Thompson, 2007). Cronbach's alphas in the present study ranged from .72 to .86 for I-PA-SF and from .77 to .81 for I-NA-SF.[29]

5.7.4 **Procedure.** All research measures and procedures were approved by the University of British Columbia's Behavioural Research Ethics Board. As mentioned above, participant

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[29] For the purpose of the multilevel modelling analyses described below, participant responses to the pre-intervention PANAS were used to calculate parallel I-PANAS-SF scores for PA and NA. Cronbach's alphas were .75 for the pre-intervention I-PA-SF and .78 for I-NA-SF.

recruitment and testing took place over two academic terms. During the first term, flyers were

distributed to students in introductory psychology classes advertising the study and providing a

link to an online pre-screening questionnaire that included the SIAS. Interested participants

completed the measures in their own time and attended a short debriefing session in the

laboratory in exchange for partial course credit. During the second term, participants completed

the SIAS-S as part of a general pre-screening measure administered by the online research

participation system operated by the department of psychology. Participants received partial

course credit in exchange for their participation. Participants could choose to opt out of this pre-

screening process.

Eligible participants were contacted by email (and, in the first term, telephone) and

invited to attend an initial laboratory session. Participants who agreed to attend the initial

laboratory session completed a questionnaire battery that included all of the measures described

above. As described above, only participants scoring 29 or higher on the SIAS during the initial

laboratory session were included in the main analyses. However, all participants completed the

full study procedure.[30] Participants were randomly assigned to one of three task conditions. All

participants were informed that the purpose of the study was to evaluate different strategies that

may improve treatment outcomes for individuals with clinical anxiety disorders. In an attempt to

equate expectancy and experimental demand, instructions for each condition included a plausible

rationale as to how that procedure might be useful in treatment. All task instructions were fully

scripted. Audio recordings of participant sessions were used to monitor experimenter adherence

to the study protocol. Five female experimenters administered the study protocol each term. The

author administered the protocol for 36.30% of the participants (40.87% of the participants

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[30] In the first term, 12 participants who scored below 29 on the SIAS during the initial laboratory session were excused from the study prior to the introduction of the intervention. This procedure was later amended to allow all participants to complete the full study protocol.

included in the main analyses). Participant testing was balanced across the experimenters such that each experimenter saw an approximately equal number of participants in each task condition.

       5.7.4.1 Acts of kindness (AK). Participants in the acts of kindness (AK) condition were asked to engage in three kind acts a day on two days each week over a four week period. Kind acts were defined as acts that benefit others or make others happy, typically at some cost to oneself (e.g., Lyubomirsky, Sheldon, et al., 2005; C. T. Tkach, 2006). Participants were given a list of examples of kind acts (e.g., *Do a roommate's dishes, Donate money to charity*) and were asked to identify 9-15 different kind acts that they would like to try out over the four week period. They were encouraged to select a variety of kind acts over the course of the study rather than repeating the same kind acts.

       5.7.4.2 Decreasing social avoidance (SA). Participants in the decreasing social avoidance (SA) condition were asked to engage in three social interactions a day on two days each week over a four week period. They were given a list of potential social interactions (e.g., *Talking to the person next to you on the bus, Asking to borrow class notes*) and were asked to identify 9-15 social interactions that were relevant and meaningful to them. They were then asked to rank these interactions from easiest to hardest. They were encouraged to start with easier interactions, gradually moving up to more difficult interactions once they became more comfortable with the interactions that they had been completing. Participants were encouraged to interact with a range of different people in a variety of social situations. They were also instructed in a deep breathing technique (i.e., breathe in through the nose for four counts and out through the mouth for four counts) that they could use prior to entering a social situation. As

discussed above, this procedure is an abbreviated analogue of graduated social exposure, a technique used to overcome avoidance in the treatment of social anxiety disorder.

       5.7.4.3 Life details (LD). Life details (LD) is a commonly used affectively neutral control condition (e.g., Bhullar et al., 2011; Boehm et al., 2011; Emmons & McCullough, 2003). The procedure for LD that was used in the present study was based on previous studies investigating PA and happiness (e.g., Sheldon & Lyubomirsky, 2006b; C. T. Tkach, 2006). Participants were asked to record a minimum of three events that occurred each day on two days each week over a four-week period. They were given a list of sample life detail records and were asked to identify and write down several thoughts, events, or activities that had occurred the previous day. Participants were encouraged to attend to a variety of life details and to record life details that occurred at different points throughout the day in an effort to increase the plausibility of the rationale provided.

       After participants were introduced to their assigned task, they were asked to complete the activity as instructed over a four-week period. Participants were given a package containing the task instructions and written record sheets for recording their participation. The instructions and examples from these packages are included in Appendix C. All participant queries were answered. Links to the online report forms were emailed to them two times each week, assessing their level of task compliance, affect, social anxiety, and social goals over the past few days. Participants were also contacted by telephone after two weeks of participation to ensure that they were able to complete the assigned task as instructed and understood all of the task instructions. To help combat attrition, each participant maintained contact with a single experimenter throughout the study. Participant response rates were monitored and email reminders and check-ins were sent out, as needed, to follow up on non-compliance (i.e., uncompleted online report

forms) and missed return sessions. The burden of completing the online report forms was

minimized by limiting their length and sending the participants links that would take them

directly to each online survey. Participants returned to the laboratory at the end of the four-week

period to complete a second online questionnaire battery. After participants had completed these

measures, they were fully debriefed. Participants received partial course credit for their

participation. Participants who attended the initial laboratory session were also entered into a

prize draw.

      5.7.5 Analytic approach. As the primary purpose of this study is to replicate Alden and

Trew's (2012) findings regarding the effect of the AK condition (relative to LD) on both PA and

social avoidance goals, a series of Analyses of Covariance (ANCOVAs) were conducted. Each

ANCOVA included the relevant return session measure as the dependent variable and the

corresponding initial session measure as a covariate. Significant omnibus effects were followed

up with pairwise comparisons. Given that there are only three groups involved in these

comparisons, Fisher's Least Significant Difference was used to control the error rate across each

set of pairwise comparisons (Seaman, Levin, & Serlin, 1991).

      Although intervention outcome data can be analyzed using several different approaches

(e.g., the analysis of post-intervention means, the analysis of the raw difference between pre- and

post-intervention scores), ANCOVAs of the post-intervention scores, controlling for relevant

pre-intervention scores, are generally considered to be superior as this approach provides more

precise estimates of the treatment effects relative to the analysis of post-intervention scores only

and the analysis of raw change scores (Frison & Pocock, 1992; Hadzi-Pavlovic, 2009). This

approach controls for potential group differences at pre-intervention. This is important as

randomization does not ensure that participants are equated at the beginning of the experiment if

there is any degree of participant loss (i.e., attrition; West, Biesanz, & Kwok, 2004) and even subtle differences between the groups may bias effect size estimates (Frison & Pocock, 1992; Sheeber, Sorensen, & Howe, 1996). This approach also has higher power as it takes advantage of the repeated measures aspect of this design (West et al., 2004) and reduces error variance by removing the portion that can be accounted for by the pre-intervention scores (Frison & Pocock, 1992; Sheeber et al., 1996; West et al., 2004).

As a second source of information regarding the primary hypotheses, group differences in in PA, NA, SGQ approach, and SGQ avoidance were also examined using multilevel modelling analyses. These analyses extend Alden and Trew's (2012) findings by using multi-item empirically validated measures of PA and NA and by examining immediate change and change over time in the endorsement of social approach and avoidance goals. These analyses are complimentary to the ANCOVA analyses and will help to shed light on the full nature of any observed changes in PA, NA, social approach goals, and social avoidance goals over time.

A secondary purpose of this study is to examine potential mediator variables that may help to explain group differences in PA and social avoidance goals at post-intervention. To this end, ANCOVAs were conducted examining group differences in post-intervention relatedness, self-esteem, state-level social anxiety, and positive social activities. As in the primary analyses, the relevant return session outcome measure was used as the dependent variable with the corresponding initial session measure used as a covariate. As state-level social anxiety was also assessed using the online report forms, a multilevel modelling analysis was conducted to help clarify the nature of any observed changes in DSA over time.

Lastly, exploratory analyses were conducted to examine whether the potential mediating variables did, in fact, mediate any observed changes on the affective and motivational variables.

110

Only potential mediators showing significant group differences that corresponded to observed group differences on the affect and motivational variables were examined. Multiple regression analyses were conducted following the approach outlined by Baron and Kenny (1986), with task condition dummy coded and the relevant pre-intervention measure included as a covariate.[31] The multiple regression equation using both task condition and the mediator variable to predict the outcome variable also included the pre-intervention measure of the mediator variable as a covariate. This approach fully reproduces the results of the primary and secondary ANCOVAs and allows us to evaluate potential mediation. Indirect effects were evaluated using Sobel tests (Sobel, 1982).[32, 33]

5.8 Results

5.8.1 Missing data. Examination of the data revealed that a number of participants were missing responses to one or more items for a given scale. For the pre-post measures, no more than six participants were missing a single item on any given scale. When only one item was

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[31] Briefly, Baron and Kenny (1986) argue that, to establish mediation, the independent variable (i.e., task condition) must predict the mediator, the independent variable must predict the dependent variable, and the mediator must predict the dependent variable when it is included in a regression model that controls for the independent variable. The relationship between the independent variable and the dependent variable should decrease in this final regression model. If the independent variable has no effect on the dependent variable after controlling for the mediator, full mediation is indicated.

[32] Mediation was also explored by conducting ANCOVA analyses of the relevant outcome measure(s) including the pre- and post-measures of the potential mediator as covariates (along with pre-intervention assessment of the dependent variable) and comparing the results to the primary analyses. The pattern of results obtained using this approach was identical to the pattern of results described below.

[33] Although bootstrapped percentile confidence intervals (Biesanz, Falk, & Savalei, 2010) provide a superior test of the significance of indirect effects, allowing us to evaluate potential mediation without making assumptions about the distribution of the indirect effects (Shrout & Bolger, 2002), this approach was not ideal in the present study as different covariates were used in each path of the mediation model and available SPSS macros (i.e., Preacher & Hayes, 2004) do not allow the user to specify different covariates for each path. However, it is important to note that the pattern of results described below was identical to the pattern of results obtained using 95% bootstrapped percentile confidence intervals with 5000 replications when the initial session measures of both the mediator and the outcome variable were included as covariates in the overall mediation model.

missing for a scale, the missing value was replaced with the mean of the individual's responses to the remaining items for that scale. Individual mean substitution was selected for its simplicity and based on research suggesting that it leads to fairly accurate results in most missing data scenarios when the proportion of missing data is relatively small (Hawthorne & Elliott, 2005; Shrive, Stuart, Quan, & Ghali, 2006). One participant was missing two items on the return session SGQ approach scale. Missing data were not imputed for this case as the missing values represented more than 20% of the items for the SGQ approach scale. As a result, one participant is omitted from the SGQ approach analysis.

For the online report forms, no more than four participants were missing a single item on a given scale. Five participants were missing two items on a given scale (one for SGQ avoidance form 1, one for DSA form 4, and one each for SGQ approach forms 2, 6, and 8). Missing data were not imputed for these cases as the missing values represented more than 20% of the available data for the given scale. One participant received seven imputed values, one received six, one received five, three received three, 18 received two, 31 received one, and 60 provided full data for all available measures (including pre-post and online report form data). The rate of imputed values did not differ significantly across the three task conditions, $\chi^2(12, N = 115) = 9.85, p = .63, w = 0.29$.

In addition to missing responses to single items, a number of participants did not complete the full set of online report forms. Twenty four participants were missing one out of the eight forms, 13 were missing two, 14 were missing three, six were missing four, six were missing five, two were missing six, and two were missing seven. The average rate of missing online report forms did not differ across the three task conditions (AK: $M = 1.55, SD = 2.05$; SA: $M = 1.41, SD = 1.41$; LD: $M = 1.53, SD = 1.89$), $F(2, 112) = 0.07, p = .94, Cohen's f = 0.03$.

5.8.2 Protocol adherence. Audio recordings were available for 101 of the initial testing sessions and 77 of the return testing sessions. These recordings were reviewed to determine the extent of experimenter adherence to the study protocol. The scripts for each of the sessions were broken down into key points. Protocol adherence was determined by coding whether important elements were missing or had been substantially altered for each of these points. Points that were missing or that had been changed to the extent that important information had been omitted were coded as 0. A score of 0.5 was assigned in cases where only a small portion of a key point was missing or had been changed. All points that had been fully conveyed were assigned a score of 1. As the number of key points for the initial session varied slightly by condition, protocol adherence scores were converted to percentages for the purpose of the analyses. On average, protocol adherence was very high and there were no group differences in protocol adherence in either the initial session (AK: $M = 98.93$, $SD = 1.84$; SA: $M = 98.38$, $SD = 3.77$; LD: $M = 98.32$, $SD = 3.31$), $F(2, 98) = 0.37$, $p = .69$, *Cohen's f* $= 0.09$, or the return session (AK: $M = 98.81$, $SD = 3.20$, SA: $M = 99.24$, $SD = 2.59$, LD: $M = 98.91$, $SD = 3.60$), $F(2, 74) = 0.15$, $p = .86$, *Cohen's f* $= 0.06$. This indicates that protocol adherence was highly similar across the three conditions and that differential adherence is not a plausible explanation for the pattern of results obtained.

5.8.3 Participant compliance. Seven participants failed to complete the study (two AK, four SA, and one LD). Although the participant drop-out rate did not differ significantly across the groups, $\chi^2(2, N = 7) = 2.00$, $p = .37$, $w = 0.53$, the effect size for this test suggests that this lack of significance may reflect a lack of statistical power. Not surprisingly, slightly more participants dropped out from the exposure based SA condition and the activity based AK condition than from the comparatively low effort LD condition. Means and standard deviations for the pre-screening and initial session measures for the study completers and non-completers

are presented in Table 4. Participants who failed to complete the study did not differ significantly from participants who completed the study on the pre-screening SIAS, $t(58) = 0.27$, $p = .79$, $d = 0.14$, pre-screening SIAS-S, $t(56) = 1.25$, $p = .22$, $d = 0.81$, or any of the initial session variables: SIAS: $t(120) = 0.86$, $p = .39$, $d = 0.33$; PA: $t(120) = -0.78$, $p = .44$, $d = -0.30$; NA: $t(120) = 1.32$, $p = .19$, $d = 0.51$; SGQ avoidance: $t(120) = -0.66$, $p = .51$, $d = 0.26$; SGQ approach: $t(120) = -1.76$, $p = .08$, $d = 0.68$; BPNS-R: $t(120) = -1.31$, $p = .19$, $d = -0.51$; RSES: $t(120) = -1.57$, $p = .12$, $d = -0.61$; IOS approach: $t(120) = -1.36$, $p = .18$, $d = 0.53$. One exception to this was the DSA, $t(10.83) = 4.04$, $p = .002$, $d = 0.76$, with the participants who completed the study showing higher levels of social anxiety during the initial laboratory session relative to those who did not complete the study.[34, 35]

It is important to note that the moderate to large effect sizes for several of these variables suggest that the lack of significance for these tests may be attributable, in part, to low statistical power. It appears that the participants who failed to complete the study were slightly less socially anxious, experienced more PA and less NA, endorsed more social approach goals and, to a lesser extent, social avoidance goals, reported greater relatedness need satisfaction and higher self-esteem, and engaged in more positive social activities than the participants who completed the study. Ultimately, it does not appear to be the case that the most socially anxious participants

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[34] Equal variances not assumed: *Levene's test of the equality of error variances: F*(1, 120) = 4.67, *p* = .03.

[35] A series of logistic regression analyses using each of the pre-intervention measures (considered separately), task condition (dummy coded), and the interaction between each pre-intervention measure and task condition to predict attrition status revealed no significant relationships between the pre-intervention measures or task condition and attrition status and no differential relationships between the pre-intervention measures and attrition status by group.

dropped out of the study. If anything, it appears that the converse is true.[36]

Participant task compliance was determined through examination of the participants' written record sheets or, when written record sheets were not available, through examination of participants' responses to the online report forms. The written record sheets were selected as the primary source of compliance data as it is possible to use these records to determine the exact number of times that the participant completed the activity. The online report forms provide more general information about whether the participant was able to complete the activity and on what days they completed the task. Written record sheets were available for 104 participants (34 in the AK group, 35 SA, and 35 LD). The number of participants who failed to return their record sheets did not differ significantly across groups, $\chi^2(2, N = 11) = 3.45$, $p = .18$, $w = 0.56$, although, again, the effect size for this test suggests possible power constraints. Slightly fewer record sheets were returned by the SA participants. Percentage of task compliance was calculated for the participants who returned their written record sheets by determining the number of times that the activity was completed out of the 24 repetitions assigned (i.e., out of the 24 kind acts, 24 social interactions, or 24 life details assigned). Percentage of task compliance was determined for the 11 participants who did not return their written record sheets by using their responses to the online report forms to determine the number of days that they reported completing the activity out of eight assigned. When participants indicated partial task compliance during the time period covered by an online report form, the number of days reported on that form was multiplied by 0.5 to reflect this partial compliance. Missing report forms were coded as non-compliance. The average self-reported rate of task compliance was 94.55% ($SD = 13.01$). There were no

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[36] Importantly, the pattern of results was identical when the ANCOVAs for the primary and secondary analyses were repeated including these participants, carrying their initial session scores over to the return session (i.e., intent-to-treat analyses). Similarly, the pattern of results was identical when the primary and secondary multilevel modelling analyses were repeated with these participants retained. One participant was necessarily excluded from these multilevel modelling analyses as they had not completed any of the online report forms.

significant group differences in task compliance (AK: $M = 95.56\%$, $SD = 11.44$; SA: $M = 91.77\%$, $SD = 16.63$; LD: $M = 96.64\%$, $SD = 9.06$), $F(2, 112) = 1.53$, $p = .22$, $Cohen's\ f = 0.17$.[37] This indicates that task compliance was fairly similar in the three task conditions, making it unlikely that differences in compliance account for any of the results obtained.

      5.8.4 Primary analyses. Prior to conducting the primary analyses, the data were evaluated for the presence of potential outliers and to ensure that the assumptions of ANCOVA were met. No univariate outliers (defined as values three or more standard deviations from the mean) were identified for the pre- or post-intervention measures. Examination of the bivariate scatterplots revealed no notable departures from linearity. Further, examination of the bivariate scatterplots, normal probability plots, and skewness and kurtosis values for each of the variables revealed no notable departures from normality. There were no significant group differences on any of the initial session variables (all p's > .05). However, as discussed above, the relevant initial session measure was included as a covariate in each of the ANCOVAs to control for subtle group differences and to maximize power by controlling for an irrelevant source of error variance. Levene's test of the equality of error variances supported homogeneity of variance for PA, $F(2, 112) = 1.02$, $p = .37$, NA, $F(2, 112) = 2.72$, $p = .07$, SGQ avoidance, $F(2, 112) = 1.03$, $p = .36$, and SGQ approach, $F(2, 111) = 2.85$, $p = .06$. The means and standard deviations for the pre- and post-intervention measures included in the primary analyses, by group, are presented in Table 5.

      A series of ANCOVA analyses were conducted to examine group differences in post-intervention PA, NA, SGQ avoidance, and SGQ approach controlling for the relevant initial session measure. Counter to expectations, no significant group differences were observed for

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[37] As Levene's test of the equality of error variances indicated significant heterogeneity of variance, $F(2, 112) = 5.72$, $p = .004$, this analysis was repeated using the approach outlined by Alexander and Govern (1994). This analysis confirmed the absence of significant group differences in task compliance, $\chi^2(2) = 2.55$, $p = .28$.

post-intervention PA, $F(2, 111) = 1.11$, $p = .33$, *Cohen's f* = 0.12. This indicates that, despite

prior findings demonstrating the effectiveness of AK as a PA enhancement technique (e.g.,

Alden & Trew, 2012), AK did not significantly increase PA relative to SA or LD. Consistent

with expectations, no group differences in NA were observed at post-intervention, $F(2, 111) =$

1.20, $p = .31$, *Cohen's f* = 0.12.

Significant group differences were, however, observed for SGQ avoidance, $F(2, 111) =$

3.44, $p = .04$, *Cohen's f* = 0.22. Pairwise comparisons revealed that, as predicted, the AK group

endorsed significantly fewer social avoidance goals at post-intervention ($M = 16.63$, $SD = 5.94$)

relative to the LD group ($M = 19.75$, $SD = 5.90$), $t(111) = -2.27$, $p = .03$, $d = 0.53$.[38] The AK

group also endorsed fewer social avoidance goals relative to the SA group ($M = 19.70$, $SD =$

5.93), $t(111) = -2.29$, $p = .02$, $d = 0.52$. The SA and LD groups did not significantly differ from

one another at post-intervention, $t(111) = -0.03$, $p = .97$, $d = 0.01$. This replicates previous

findings (Alden & Trew, 2012) and suggests that performing acts of kindness results in an

overall reduction in social avoidance goal endorsement whereas tasks that aim to directly reduce

avoidance (in this case, SA) do not. Also replicating previous findings, no significant group

differences in SGQ approach were observed at post-intervention, $F(2, 110) = 0.97$, $p = .38$,

Cohen's f = 0.11.

These findings suggest that, although AK resulted in a decrease in social avoidance goals

relative to the other two conditions, this decrease was independent of change in PA, as post-

intervention PA did not differ significantly across groups. This is consistent with Alden and

Trew's (2012) finding that change in PA was uncorrelated with change in SGQ avoidance. In the

present study, change in PA (i.e., the standardized residual obtained using initial session PA to

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[38] Means reported in the ANCOVA sections have been adjusted for group differences on the relevant initial session
measure.

predict return session PA) did not significantly correlate with change in SGQ avoidance (i.e., the corresponding standardized residual) in the full sample, $r = -0.11$, $p = .24$. Interestingly, however, when examined separately within each group, this inverse correlation was significant for the AK group, $r = -0.50$, $p = .001$, but not the SA, $r = -.12$, $p = .47$, or the LD, $r = .26$, $p = .13$, groups. This suggests that, although PA did not increase on average in the AK group, increased PA was indeed associated with decreased social avoidance goals in this group.

5.8.4.1 Multilevel modeling. To examine whether group differences can also be observed in participants' self-reported affect and social goals over the course of the study and to clarify the full nature of the pre-post results, participant responses to the I-PANAS-SF and the SGQ from the online report forms were subjected to multilevel modelling analyses with multiple time points nested within participants. Time was included as a level one (within participants) predictor and was coded with the first online assessment set at 0. The relevant pre-intervention measure of affect/goals, grand mean centered, was included as a level two (between participants) covariate. This allowed us to examine intervention effects on affect and goals, as the outcome variable becomes a residualized gain score. Using pre-intervention affect/goals as a covariate and this particular coding scheme for time, the intercept reflects initial gains that occurred between the pre-intervention assessment and the first online report form (administered three days after the initial session). The slope then indicates whether these gains are maintained over time, increase with repeated practice, or decay over time (West et al., 2004). Both the intercept and the slope were allowed to vary across participants. Task condition was dummy coded and grand mean centered and was included as a level two predictor. These dummy codes were then recoded to provide all pairwise comparisons. These models were estimated in *R* using the lme4 package (Bates & Sarkar, 1998; R Development Core Team, 2006).

Prior to conducting the multilevel modelling analyses, the variables were examined for the presence of univariate outliers (i.e., values three or more standard deviations from the mean) and for non-normality. One univariate outlier was detected for session eight I-PA-SF.[39] Examination of the normal probability plots and skewness and kurtosis values for each measure at each time point revealed no problematic departures from normality. The means and standard deviations for the multilevel modelling analyses, by condition, are presented in Table 6. The means for PA, NA, SGQ avoidance, and SGQ approach at each time point are also displayed in Figures 8 through 11, respectively. The unstandardized coefficients for the fixed effects from the multilevel modelling analyses are presented in Table 7 along with the standard error and t-test for each effect.

The results of the multilevel modelling analyses concur with the ANCOVA results. Examination of the unconditioned effects omitting all level two predictors with the exception of the pre-intervention outcome measure revealed that, averaged across all participants, PA decreased somewhat over time, $\pi_{1i} = -0.15$, *Standard Error (SE)* $= 0.05$, $t = -3.03$.[40] Examination of the conditioned effects revealed no group differences in initial task response or change in PA over time, confirming a lack of group differences in PA. Examination of the unconditioned effects for NA revealed that, on average, NA was relatively stable over time, $\pi_{1i} = -0.05$, $SE = 0.05$, $t = -0.88$. Examination of the conditioned effects revealed no significant group differences

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[39] Omitting this case did not affect the pattern of results obtained in the I-PA-SF analyses. Unconditioned slope of time: $b = -0.16$, $SE = 0.05$, $t = -3.23$; intercept: $b = 14.27$, $SE = 0.45$, $t = 31.68$; effect of initial session PA on intercept: $b = 0.48$, $SE = 0.06$, $t = 7.62$; effect of AK vs. LD on intercept: $b = 0.03$, $SE = 0.63$, $t = 0.05$; effect of SA vs. LD on intercept: $b = -0.36$, $SE = 0.62$, $t = -0.58$; effect of SA vs. AK on intercept: $b = -0.39$, $SE = 0.60$, $t = -0.65$; slope of time: $b = -0.12$, $SE = 0.09$, $t = -1.39$; effect of initial session PA on slope: $b = -0.01$, $SE = 0.01$, $t = -0.54$; effect of AK vs. LD on slope: $b = -0.06$, $SE = 0.12$, $t = -0.52$; effect of SA vs. LD on slope: $b = -0.04$, $SE = 0.12$, $t = -0.32$; effect of SA vs. AK on slope: $b = 0.02$, $SE = 0.12$, $t = 0.21$.

[40] The significance of the t-values for the multilevel modelling analyses is based on t-values greater than 2. The unconditioned models include the relevant initial session measure, grand mean centered, as a level 2 covariate.

in initial task response or change in NA over time, also confirming a lack of group differences in NA.

The results for SGQ avoidance provide additional insight into the treatment effects observed in the ANCOVA analysis. Examination of the unconditioned effects for SGQ avoidance revealed that, on average, endorsement of social avoidance goals decreased over time, $\pi_{1i} = -0.35$, $SE = 0.08$, $t = -4.35$. Examination of the conditioned effects revealed that the LD and AK groups showed lower scores on SGQ avoidance at the time of the first online report form relative to the SA group. Examination of the means from Table 6 reveals that SGQ avoidance stayed relatively constant from pre-intervention to time 1 in the SA group, suggesting a delayed response to the intervention in this group. The results further reveal that both the AK and SA groups show a greater reduction in social avoidance goals over time relative to the LD group but do not differ from each other in the degree of change over time. This suggests that both interventions result in notable reductions in SGQ avoidance, with the smaller initial response in the SA group likely contributing to a significantly lower overall treatment effect in the pre-post analyses relative to AK.

Examination of the unconditioned effects for SGQ approach revealed that, on average, endorsement of social approach goals decreased over time, $\pi_{1i} = -0.18$, $SE = 0.07$, $t = -2.47$. Again, no group differences were observed on initial task response or change in SGQ approach over time. These results confirm a general lack of intervention effects for PA, NA, and social approach goals and help to clarify the nature of the pre-post effects for SGQ avoidance, supporting the ANCOVA findings using a different assessment procedure and a different analytical framework.

5.8.5 Secondary analyses. A second purpose of the present study is to investigate

possible mediators of any observed affective and motivational effects. Four potential mediators

were evaluated: satisfaction of relatedness needs (BPNS-R), self-esteem (RSES), state-level

social anxiety (DSA), and frequency of positive social activities (IOS approach). Prior to

conducting these analyses, the data were evaluated for the presence of potential outliers and to

ensure that all assumptions of ANCOVA were met. No univariate outliers (defined as values

three or more standard deviations from the mean) were identified. Examination of the bivariate

scatterplots revealed no notable departures from linearity. In addition, examination of the

bivariate scatterplots, normal probability plots, and skewness and kurtosis values for each of the

variables revealed no notable departures from normality. Again, there were no group differences

on any of the initial session variables (all p's > .43). However, as in the primary analyses, the

relevant initial session measure was included as a covariate in each analysis to maximize the

power of the group comparisons by removing a potential source of error variance and controlling

for subtle group differences on the pre-intervention variables. Levene's test of the equality of

error variances supported homogeneity of variance for the BPNS-R, $F(2, 112) = 0.42$, $p = .66$,

RSES, $F(2, 112) = 0.89$, $p = .41$, DSA, $F(2, 112) = 0.66$, $p = .52$, and IOS approach, $F(2, 112) =$

0.20, $p = .82$. The means and standard deviations for the pre- and post-intervention measures

included in this analysis, by group, are presented in Table 8.

ANCOVA analyses revealed significant group differences on the BPNS-R, $F(2, 111) =$

4.03, $p = .02$, *Cohen's f* = 0.21. Pairwise comparisons indicated that the SA group scored

significantly higher at post-intervention ($M = 44.20$, $SD = 4.97$) than both the AK group ($M =$

41.41, $SD = 4.97$), $t(111) = -2.49$, $p = .01$, $d = 0.56$, and the LD group ($M = 41.49$, $SD = 4.98$),

$t(111) = 2.37$, $p = .02$, $d = 0.54$. The AK and LD groups did not differ from one another at post-

intervention, $t(111) = -0.07$, $p = .94$, $d = 0.02$. Group differences were also identified for the

RSES, $F(2, 111) = 3.91$, $p = .02$, *Cohen's f* = 0.19. Again, the SA group scored higher at post-

intervention ($M = 49.21$, $SD = 8.26$) than both the LD group ($M = 44.24$, $SD = 8.25$), $t(111) =$

2.62, $p = .01$, $d = 0.60$, or the AK group ($M = 45.28$, $SD = 8.23$), $t(111) = -2.11$, $p = .04$, $d =$

0.48, which did not differ from one another, $t(111) = 0.54$, $p = .59$, $d = 0.13$.

Group differences were also identified for the DSA, $F(2, 111) = 4.20$, $p = .02$, *Cohen's f*

= 0.25. Both the AK group ($M = 10.69$, $SD = 5.39$), $t(111) = -2.17$, $p = .03$, $d = 0.50$, and the SA

group ($M = 10.00$, $SD = 5.39$), $t(111) = -2.77$, $p = .01$, $d = 0.63$, scored lower on state-level social

anxiety at post-intervention relative to the LD group ($M = 13.41$, $SD = 5.39$). The AK group and

SA group did not differ from one another at post-intervention, $t(111) = 0.57$, $p = .57$, $d = 0.13$.

Lastly, group differences were identified for the IOS approach, $F(2, 111) = 5.39$, $p = .01$,

Cohen's f = 0.21. The SA group reported engaging in more positive social activities at post-

intervention ($M = 48.77$, $SD = 7.79$) than the LD group ($M = 42.93$, $SD = 7.79$), $t(111) = 3.28$, p

= .001, $d = 0.75$, but not the AK group ($M = 45.96$, $SD = 7.78$), $t(111) = -1.60$, $p = .11$, $d = 0.36$.

The AK group also did not differ significantly from the LD group, $t(111) = 1.67$, $p = .10$, $d =$

0.39. The effect size for this comparison suggests that AK did result in small, if non-significant,

increases in positive social activity relative to LD.

    5.8.5.1 Multilevel modelling. Participant responses to the DSA from the online report

forms were analyzed to clarify the nature of the observed intervention effects from the

ANCOVA analysis. Prior to conducting the multilevel modelling analysis, the DSA was

examined for the presence of univariate outliers and for potential non-normality. No outliers

were detected and examination of the normal probability plots and skewness and kurtosis values

for each administration of the DSA revealed no problematic departures from normality. The

means and standard deviations for each administration of the DSA, by condition, are presented in Table 9. The means for the DSA at each time point are also displayed in Figure 12. The unstandardized coefficients for the fixed effects from the multilevel modelling analysis, along with their respective standard errors and t-tests, are presented in Table 10. As in the primary analyses, time (with the first report form coded as 0) was included as a level one predictor and pre-intervention DSA (grand mean centered) was included as a level two predictor. Examination of the unconditioned effects revealed that, on average, state-level social anxiety decreased over the course of the study, $\pi_{1i} = -0.31$, $SE = 0.08$, $t = -4.12$. The conditioned effects revealed that, although task condition did not affect the initial treatment response, both the SA and AK groups showed a greater decrease in social anxiety over time relative to the LD group. As in the ANCOVA results, the AK and SA groups did not differ from one another in the degree of change over time. This supports the ANCOVA findings and indicates that both the AK and SA conditions led to a significant reduction in social anxiety over time.

　　　5.8.6 Mediation analyses. Given that the only significant intervention effect observed in the primary analyses was the effect of AK on SGQ avoidance and the only potential mediator to show an intervention effect in the AK group was DSA, the mediation analyses examined the potential mediating role of change in state-level social anxiety in the effect of the AK condition on SGQ avoidance. Prior to conducting the mediation analyses, the assumptions of multiple regression were evaluated for each of the pathways included in the mediation model. Examination of the bivariate scatterplots and added variable plots for each regression equation supported linearity of the relationships. Further, examination of the non-constant variance plots supported homoscedasticity of the residuals ($p > .05$ for all Cook-Weisberg score tests). Normal probability plots and histograms supported the normality of the residuals. Examination of the

leverage, outlier t, and Cook's d values revealed no multivariate outliers, with the highest Cook's d at 0.25.

As mentioned above, task condition was dummy coded and then recoded to provide all pairwise comparisons and the relevant pre-intervention variable(s) were included as covariates in each of the multiple regression analyses. The results of the mediation analyses are presented in Figure 13. All direct effects are presented with 95% bias corrected and accelerated bootstrapped confidence intervals based on 5000 resamples. All indirect effects were tested for significance using Sobel tests. Consistent with the ANCOVA findings, the AK condition resulted in greater reductions in SGQ avoidance relative to both the LD and SA conditions which did not differ. Both the AK condition and the SA condition resulted in greater reductions in DSA relative to the LD condition. The AK and SA conditions did not differ from one another. Reductions in DSA, in turn, significantly predicted reductions in SGQ avoidance.

Examination of the indirect effects revealed significant indirect effects of task condition on SGQ avoidance through DSA for both the AK relative to LD and SA relative to LD comparisons, but not for the AK relative to SA comparison. The significant indirect effect of SA on SGQ avoidance through DSA suggests that SA may decrease social avoidance goals indirectly by decreasing social anxiety. Although it is important to recall that social avoidance goals did not significantly decrease in the SA group (relative to LD) at post-intervention, it is possible that changes in state-level social anxiety may lead to observable changes in social avoidance goals over time, consistent with the multilevel modelling results. Examination of the direct effect of task condition on SGQ avoidance after controlling for change in DSA suggests that change in DSA fully mediated the intervention effect for AK (relative to LD) on change in SGQ avoidance according to the criteria outlined by Baron and Kenny (1986). Change in DSA

did not, however, mediate the intervention effect of AK relative to SA on SGQ avoidance. This is not particularly surprising given that social anxiety decreased in both the AK and SA groups (relative to LD) and suggests that additional variables may better explain the group differences in social avoidance goals that were observed between AK and SA at post-intervention.

5.9 Discussion

Although AK did not increase PA, both the pre-post and multilevel modelling analyses revealed that engaging in acts of kindness led to a reduction in social avoidance goals. This decrease in avoidance goals appears to be attributable to a corresponding reduction in social anxiety. Although the pre-post analyses found that SA did not decrease social avoidance goals, the multilevel modelling analyses suggest that SA may have had a significant effect on avoidance goals with more time. Consistent with this, the mediation analyses indicated that SA led to a reduction in state-level social anxiety which, in turn, predicted change in social avoidance goals. By decreasing social anxiety, SA may eventually lead to a noticeable reduction in avoidance goals. These findings suggest that anxiety reduction may play an important role in decreasing social avoidance goals. Although SA had no effect on PA, social exposure did increase relatedness need satisfaction, self-esteem, and the frequency of positive social activities. In contrast, AK did not change these outcomes relative to the activity monitoring control condition. This suggests that, although AK may lead to a more rapid (if not larger) reduction in social avoidance goals, SA may contribute to broader changes in adaptive functioning. These findings carry implications for the use of AK in the treatment of social anxiety and are discussed in greater detail below.

5.9.1 Changes in affect. Neither AK nor SA led to significant changes in PA relative to the LD condition. Although previous studies have suggested that social exposure may not affect

PA (Courbasson & Nishikawa, 2010), the lack of PA enhancement in the AK condition is inconsistent with previous findings (Alden & Trew, 2012; Buchanan & Bardi, 2010; Lyubomirsky, Sheldon, et al., 2005; Otake et al., 2006). Although it is important to note that the effects of AK can be quite subtle (e.g., C. T. Tkach, 2006) and that the present study suffered from power limitations, the pattern of means suggests that this did not affect the ability of the analyses to detect improvements in PA. If anything, PA appeared to *decline* slightly in the AK group relative to LD. In addition, although previous studies have suggested that the timing (Lyubomirsky, Sheldon, et al., 2005), target (Williamson & Clark, 1989), and variety (Sheldon et al., in press) of kind acts may affect outcomes, the AK task used in the present study was identical to the one used by Alden and Trew (2012), suggesting that it is theoretically capable of increasing PA. As a result, it is unclear why PA did not increase in the present study.

One possible explanation for the lack of change in PA is that engaging in acts of kindness may not have fit with participants' needs and values. As mentioned above, Fordyce (1977, 1983) has suggested that the specific activities that are most effective at increasing happiness may vary depending on participants' needs and specific areas of weakness. Consistent with this, it has been argued that people have enduring strengths, interests, values, and inclinations that may lead them to benefit more from some activities than from others (Sheldon & Lyubomirsky, 2004). If a task is inconsistent with one's interests and values, accomplishing this task will likely have a diminished effect on well-being (Sheldon & Elliot, 1999). Meta-analyses and brief prospective studies support the notion that pursuing goals and activities for authentic, self-concordant reasons is associated with greater goal attainment and enhanced well-being (Koestner, Lekes, Powers, & Chicoine, 2002; Sheldon & Houser-Marko, 2001; see Sheldon & Kasser, 2001, for a review). Although it is difficult to imagine acts of kindness being highly discordant with

126

participants' needs and values, it is possible that AK did not provide the degree of person-activity fit required to produce PA enhancement in the present study, with subtle group differences in person-activity fit helping to account for the divergent pattern of results relative to Alden and Trew (2012).

Perceived goal autonomy may also limit the effectiveness of AK. Whereas goals that are autonomously motivated (i.e., fully self-determined) have been linked to greater subjective well-being, goals that are externally controlled (i.e., where the participant feels pressure to think, feel, or behave in a specific way) have been linked to lower subjective well-being and a greater decline in well-being over time (Sheldon, Ryan, Deci, & Kasser, 2004). Engaging in goals for externally controlled reasons has been negatively linked to performance, behavioural persistence, and mental and physical health (Deci & Ryan, 2000). Consistent with this, when motivated by the desire to gain pleasure, prosocial behaviour (i.e., helping) is positively related to self-actualization, self-esteem, life satisfaction, and PA and negatively related to NA. However, when motivated by the desire to fulfill a duty or conform to a social norm, prosocial behaviour is unrelated to self-actualization, self-esteem, life satisfaction, and PA and positively related to NA (Gebauer, Riketta, Broemer, & Maio, 2008). If participants felt pressured to engage in acts of kindness, this "controlled" motivation may have undermined the potential benefits of the task (Deci & Ryan, 1985; Lyubomirsky et al., 2011; R. M. Ryan & Deci, 2000). Although it is important to note that the acts of kindness task used in the present study included a number of features that may enhance perceived autonomy, including the freedom to select specific kind acts to try, to schedule kind acts at convenient times, to take advantage of natural opportunities to engage in kind acts, and to freely select the recipient of the kind acts, it is conceivable that subtle

group differences in perceived autonomy may help to account for the difference in findings relative to Alden and Trew (2012).

It is also important to note that, in an effort to reduce demand characteristics, participants in the AK condition were not aware that they were engaging in a PA intervention. A study by Lyubomirsky, Dickerhoof, Boehm, and Sheldon (2011) found that happiness interventions were more effective when participants were aware that these interventions were meant to increase happiness and self-selected into these interventions. Similarly, meta-analytic studies have found that self-selection is associated with greater improvements in well-being, possibly due to higher levels of motivation or more positive expectancies (Sin & Lyubomirsky, 2009). Consistent with this, participants who believed that it was both possible and desirable to increase their happiness were more likely to report increases in well-being after pursuing need satisfying goals (Sheldon et al., 2010). This suggests that the motivation or "will" to become happier may be critical to the effectiveness of PA interventions (Lyubomirsky et al., 2011). Alternately, it suggests that stronger PA effects tend to be observed when studies include demand characteristics that may promote reports of PA enhancement. It is possible that AK was less effective in the present study because this study controlled for demand and did not inform participants that they were engaging in a task that was meant to increase PA. However, it is unclear why this did not affect Alden and Trew's (2012) findings, as their participants were similarly unaware that AK was expected to increase PA.

It is also a distinct possibility that changes in PA did occur in the AK condition but were subject to rapid hedonic adaptation. This explanation is particularly compelling as it is consistent with anecdotal evidence, with several participants reporting that they felt good after performing acts of kindness but that these positive emotions did not last. Rapid hedonic adaptation could

account for the lack of change in PA in both the online report forms and the pre-post data. This is consistent with the hedonic treadmill model (Brickman & Campbell, 1971) and suggests that the AK condition may have lacked important features that help to prevent hedonic adaptation. For example, although participants were encouraged to vary the kind acts that they performed, no attempt was made to ensure that this instruction was followed. It is possible that participants in Alden and Trew's (2012) study may have completed the activity in a way that was more resistant to hedonic adaptation.

Lastly, it is possible that characteristics of the participant sample and the kind acts performed by the participants may have contributed to the failure to replicate PA gains in the present study. The participants in the present study were more socially anxious than the sample used by Alden and Trew (2012). This may have introduced additional hedonic barriers and decreased the likelihood of PA enhancement. In addition, Alden and Trew's (2012) participants reported lower PA at pre-intervention, with participants in the present study reporting levels of PA that approached normative values (e.g., Crawford & Henry, 2004; Watson, Clark, & Tellegen, 1988). Given that social interaction anxiety is typically associated with PA deficits (e.g., Hughes et al., 2006; Kashdan, 2004), participants in the present study may have been near the upper end of their hedonic set range, leaving less room for improvement. As there were observable group differences on these variables, these group differences provide a plausible explanation for the lack of change in PA in the present study.

Participants may have also differed on unmeasured variables. For example, Conway, Rogelberg, and Pitts (2009) found that helping increased PA in participants low in dispositional altruism but not those high in altruism. If participants in the present study were higher in dispositional altruism, they may have been less likely to benefit from AK. Lastly, participants in

the present study may have performed more trivial kind acts than the participants in Alden and Trew's (2012) study (e.g., holding the door open for someone vs. volunteering at a facility for seniors), a factor that is argued to reduce the benefits of helping (Harris, 1977) and engaging in acts of kindness (C. T. Tkach, 2006). Data are available on both the variability and nature of the kind acts completed by the participants and these data will be included in future analyses.

Consistent with expectations, engaging in kind acts did not lead to significant changes in NA relative to LD. This is in line with Alden and Trew's (2012) findings and several previous studies demonstrating a lack of relationship between NA and positive activity changes, PA techniques, and altruistic behaviour (Chan, 2010; Dulin & Hill, 2003; Sheldon & Lyubomirsky, 2006a). Interestingly, SA also failed to change NA relative to the LD condition. This is somewhat unexpected, as previous studies have linked exposure to reductions in NA (Courbasson & Nishikawa, 2010). However, few studies have investigated whether exposure leads to changes in NA itself. It is possible that changes may be more apparent for specific affective variables such as social anxiety. It is also possible that it takes more than four weeks for changes in NA to become apparent. Consistent with this, Courbasson and Nishikawa (2010) found significant reductions in NA after ten weeks of treatment.

5.9.2 Changes in motivation. Also consistent with Alden and Trew's (2012) findings, AK resulted in a significantly larger reduction in social avoidance goals relative to both of the comparison conditions. This reduction was apparent in both the pre-post and multilevel modelling analyses and provides further support for the notion that engaging in acts of kindness is an effective avoidance reduction strategy. These findings also indicate that changes in motivation are largely independent of changes in affect. This suggests that change in PA may reflect one of several viable routes to social avoidance reduction. Identifying additional variables

130

that influence social goal selection will be important in determining why AK decreased social avoidance goals and whether other interventions, PA or otherwise, may be more effective at accomplishing this objective.

The pre-post analyses indicated that SA did not reduce social avoidance goals relative to LD. This is surprising given that previous studies have found that exposure decreases social avoidance (Hofmann et al., 2004; Mattick & Peters, 1988; Mattick et al., 1989). However, the multilevel modelling analyses provide additional insight into the relationship between SA and social avoidance goals. While a reduction in social avoidance goals was observed in the first few days after the initial session in both the AK and LD groups, this early reduction did not occur in the SA condition. It is possible that negative expectancies in the SA condition (e.g., anticipating rejection or humiliation) impeded reductions in social avoidance, particularly early in the process when participants had little opportunity to disconfirm their social fears. The SA group did, however, show a downward trajectory in avoidance goals over time relative to LD. The rate of this decrease over time was equivalent to the rate of decrease over time in the AK group. This suggests that, as the participants engaged in more social interactions, they accumulated information that was inconsistent with their social fears (D. M. Clark & Wells, 1995), contributing to reduced perceptions of threat, more positive expectancies, and a decrease in social avoidance goals over time. While the level of social avoidance goals in the SA group had just caught up to the LD group by post-intervention, it is possible that the SA group would have shown a significant reduction in social avoidance goals with additional time. This suggests that the SA group showed a delayed response rather than a lack of response per se.

Lastly, consistent with Alden and Trew (2012), social approach goals did not change in response to AK. SA was also unsuccessful at changing social approach goals relative to LD. This

is inconsistent with previous studies linking exposure to increased social approach (Mattick & Peters, 1988; Mattick et al., 1989). However, it is important to note that these studies used behavioural approach tasks to assess social approach. It is possible that these findings do not extend to social goals. It is also possible that socially anxious participants have reasonably high levels of social approach motivation to begin with (e.g., Meleshko & Alden, 1993). Although Study 1 supported an inverse relationship between social anxiety and social approach goals, Study 2 did not, suggesting that social anxiety does not uniformly predict fewer social approach goals. While the lack of normative data for the SGQ makes it difficult to establish whether participants in the present study expressed a typical level of social approach goals, this may have left less room for improvement, contributing to these non-significant results.

5.9.3 Effects on potential mediators. Performing acts of kindness was not associated with significant changes in relatedness need satisfaction, self-esteem, or the frequency of positive social events relative to LD. This is somewhat surprising given the literature reviewed above. It is possible that AK did not lead to improvements in relatedness need satisfaction or self-esteem because the task was perceived as externally motivated (e.g., Gebauer et al., 2008), minimizing its subsequent benefits. It is also possible that an increase in positive social activity is required to effect changes in relatedness need satisfaction and self-esteem. This is consistent with research indicating that enjoyable social activities predict daily feelings of relatedness (Reis et al., 2000) and is also consistent with the sociometer model of self-esteem (Leary et al., 1995),with positive social activities serving as an indicator of social worth and enhancing self-esteem. Consistent with Alden and Trew's (2012) findings, although AK led to a minor increase in the frequency of positive social interactions, falling between LD and SA at post-intervention, this change was not significant and may have fell short of what is needed to ensure change in the other two variables.

This lack of change in positive social activity is inconsistent with the argument that engaging in acts of kindness will strengthen social bonds and lead to other social benefits (e.g., Kurtz & Lyubomirsky, 2008), suggesting that it is important to assess the social outcomes associated with AK.

The only potential mediator to change in response to AK was state-level social anxiety. This is consistent with the argument that positive activities such as AK may change negative construals, helping to alleviate associated distress (Lyubomirsky & Dickerhoof, 2010). This reduction in social anxiety fully mediated the relationship between performing acts of kindness (relative to LD) and decreased social avoidance goals. This is consistent with research supporting a relationship between social anxiety and avoidance tendencies (e.g., Ishiyama, 1999; Leary et al., 1986; Meleshko & Alden, 1993; Rodebaugh, 2007) and suggests that anxiety reduction may be an important mechanism of change in AK. However, given that social anxiety and social avoidance goals were assessed concurrently, it is not possible to establish causality. Although escalating anxiety symptoms have been argued to predict subsequent escape and avoidance (Otto & Safren, 2001), the causal direction of this relationship can only be established with further research.

As predicted, SA also led to a significant reduction in social anxiety relative to LD. Further, the mediation analyses indicated that social anxiety reduction was associated with a concurrent reduction in social avoidance goals. While it is important to avoid over-interpreting these findings, as changes in social anxiety were not accompanied by a significant reduction in social avoidance goals in this group at post-intervention, these findings provide some support for the notion that a decrease in avoidance goals may become apparent with more time. By reducing social anxiety, SA may eventually lead to significant reductions in social avoidance. These

findings suggest that it may be worthwhile to examine state-level social anxiety as a direct predictor of social goals, as anxiety reduction may an important mechanism in decreasing avoidance tendencies.

It is also important to note that change in social anxiety did not mediate group differences in avoidance goal reduction between AK and SA. This is not surprising given that social anxiety changed in both groups and suggests that other variables contribute to the stronger (or at least faster) effect of AK on avoidance goals. The literature suggests a number of variables that may help to account for the effects of AK, including the development of more positive construals (Lyubomirsky & Dickerhoof, 2010), the gratitude expressed by others, other forms of social reinforcement (C. T. Tkach, 2006), and the development of a stronger social support network (Sheldon & Lyubomirsky, 2004). It remains to be determined whether these variables help to account for change in social avoidance goals.

SA was also associated with a number of additional benefits. Consistent with previous studies indicating that social activities contribute to daily feelings of relatedness (Reis et al., 2000), SA increased relatedness need satisfaction relative to LD. It appears that this is the first study to demonstrate this effect, expanding the range of known benefits associated with graduated social exposure. SA also increased self-esteem relative to LD. This is in line with previous studies demonstrating self-esteem enhancement following the treatment of social anxiety (Olivares et al., 2002) and is consistent with the sociometer model of self-esteem, with more frequent social interactions presumed to increase one's perceived social value (Leary et al., 1995). This increase in self-esteem may also reflect positive perceptions of the self as more social, consistent with self-perception theory (Bem, 1972). Lastly, SA led to an increase in the frequency of positive social activities. This outcome is not particularly surprising, as SA involves

intentionally engaging in social interactions and participants are likely to select interactions that are enjoyable to them. However, it appears that few studies have directly evaluated whether social exposure leads to meaningful increases in positive social activity. These findings indicate that it does.

      5.9.4 Implications for the treatment of social anxiety. These findings indicate that, in addition to reducing social anxiety, performing acts of kindness has a more rapid, if not stronger, effect on social avoidance goals than SA, a self-directed analogue of graduated social exposure. Although both AK and SA were successful at reducing social anxiety, the fact that AK led to a significant reduction in social avoidance goals after four weeks whereas SA did not suggests that AK is not reducible to an alternative form of social exposure or an alternative anxiety reduction strategy. In addition, although AK did not increase positive social activities relative to LD, SA did increase these activities with no corresponding change in social avoidance goals. This suggests that the effects of AK cannot be attributed to more frequent social activity. The reduction in social avoidance goals in the AK group also appears to be largely independent of changes in PA, NA, relatedness need satisfaction, and self-esteem. This suggests that other features of AK make it particularly effective at reducing social avoidance.

      One possible explanation for the relative superiority of AK as an avoidance reduction strategy is that participants may find it easier to engage in acts of kindness, particularly when first initiating the activity. If participants anticipate that kind acts will lead to gratitude and other positive responses from the recipient, they may perceive less social threat and be more willing to engage in AK. Other social interactions (e.g., the interactions included in graduated social exposure) may be seen as more ambiguous, leading to higher perceptions of threat and less positive outcome expectancies. This may make it more difficult to engage in SA. Consistent with

this, attrition was slightly higher in the SA condition than in the AK condition. This suggests that it may be beneficial to consider the use of AK in the treatment of social anxiety.

However, the additional benefits associated with SA suggest that, rather than switching from graduated social exposure to AK, it would be advantageous to investigate whether blending these two techniques leads to superior outcomes. AK may serve, in a sense, as an introductory form of social exposure, increasing positive expectancies and social engagement and decreasing avoidance goals by promoting positive interactions that contradict social fears. AK would also provide exposure to situations that involve positive evaluation, helping to decrease any associated fears (Kashdan et al., 2011). Increasing acts of kindness is also consistent with interpersonally oriented treatment approaches that seek to encourage adaptive relationship-facilitating behaviour (e.g., Alden & Taylor, 2011). As treatment progresses, social exposure exercises may focus increasingly on more ambiguous social interactions where the interpersonal outcome is less certain. This is, in some ways, consistent with the argument that including PA techniques in the treatment of social anxiety may improve treatment outcomes (Hofmann et al., 2011; Kashdan, 2004). In other ways, this recommendation goes beyond this by suggesting that it may be possible to increase the benefits associated with graduated social exposure by integrating AK directly into the exposure hierarchy. This may represent the best of both worlds, allowing clinicians to capitalize on the full range of benefits associated with these techniques in the treatment of social anxiety.

6 Conclusion

These studies make a number of important contributions to the literature. Studies 1 and 2 developed and replicated a hierarchical model of approach and avoidance processes in social interaction anxiety that links general motivational tendencies to affective variables and, ultimately, to idiographic social goals. By taking an exploratory approach to model development, these studies identified inverse pathways linking BIS sensitivity to PA and PA to anxious avoidance goals that were not predicted by existing conceptual models. Study 3 built on these findings, supporting the notion that engaging in acts of kindness is an effective way to reduce social avoidance goals. These findings also suggest that it may be important to examine the relationship between affect and social goals in greater detail to identify additional predictors of social approach and avoidance goals. Study 3 also made a valuable contribution to the literature by demonstrating that, in addition to reducing social anxiety, self-directed graduated social exposure is effective at increasing relatedness need satisfaction, self-esteem, and the frequency of positive social activities that may contribute to enhanced well-being. While these findings are consistent with a number of connections made in the literature, few studies have directly examined whether exposure leads to change in these variables. By demonstrating that SA contributed to a range of positive outcomes, this study contributes to a growing literature investigating whether therapeutic interventions can be used to improve overall functioning and well-being in addition to alleviating distress (e.g., Fava et al., 2005, 1998; Keyes & Lopez, 2002; Seligman et al., 2006).

These findings carry a number of implications for both research and practice. Studies 1 and 2 suggest that a hierarchical framework can be used to understand approach and avoidance processes in social interaction anxiety. The pattern of relationships between the variables

supports the separation of motives and goals and the inclusion of affective variables as mid-level predictors of social goal selection. Hierarchical models such as the one developed in Studies 1 and 2 are advantageous in that it is possible to add additional predictors at any level of the motivational hierarchy. In addition, while the present studies focused on predicting and changing social goals, the model outlined in Figures 4 and 6 can be extended to account for meaningful behaviour and social and emotional outcomes. This opens up new avenues of research into approach and avoidance processes in social interaction anxiety that will help us to better understand the nature of social anxiety and the impact that these motivational processes have on social functioning.

All three studies also suggest that it is important to re-evaluate the relationship between affect and motivation and, more specifically, to explore the nature of the relationship between PA and avoidance tendencies. Both Carver and Scheier (1998, 2008) and Higgins (Higgins, 1987; Higgins et al., 1985; Molden et al., 2008; Strauman & Higgins, 1987, 1988) have argued that activated positive emotions (e.g., PA, elation) are linked to approach tendencies whereas activated negative emotions (e.g., NA, anxiety) are linked to avoidance tendencies. These models may need to be revised in order to account for less intuitive relationships between these affective and motivational variables, particularly the inverse relationship found between BIS sensitivity and PA in Studies 1 and 2. Given that BIS sensitivity proved to be an equal, if not stronger, (inverse) predictor of PA relative to BAS sensitivity, the relationship between PA and avoidance motivation should be explored in greater detail. As discussed above, these inverse relationships are consistent with the joint subsystems hypothesis (Corr, 2001) and suggest that, although the basic motivational systems are independent as higher order motivational constructs, they interact to determine affective and motivational outcomes.

In addition, these studies suggest that it is important to continue the search for predictors of social approach and avoidance goals. Given that avoidance goals changed in the absence of PA enhancement in Study 3, it is very likely that other factors are relevant to goal selection. This is consistent with the relatively small relationship between PA and anxious avoidance goals found in Studies 1 and 2. Study 3 suggests that, although dispositional social anxiety (i.e., the SIAS) may not directly predict avoidance goals, state-level social anxiety may have a direct influence on social goal selection and may be relevant to avoidance reduction. As suggested above, other factors that may influence social goal selection include adaptive and maladaptive social construals, reinforcing social experiences, the presence of social support, positive and negative expectancies, self-efficacy, and perceptions of threat. Including a wider range of variables in future predictive models will provide greater insight into the factors that influence social goal selection and facilitate the development of interventions that promote more adaptive social goals.

The findings from Study 3 also suggest that it is important to evaluate the boundary conditions for PA techniques such as AK to ensure that these techniques are effective in a given participant sample. Although Study 3 used the same AK condition used by Alden and Trew (2012), AK did not increase PA relative to LD. While the participant sample in Study 3 differed from Alden and Trew's (2012) sample in their level of social interaction anxiety and PA, there may be additional features of the task and the participant sample that limited the effectiveness of AK. Rather than developing a wider range of PA interventions, it may be worthwhile to examine the optimal conditions for existing techniques, including the characteristics of the participants most likely to benefit from these interventions. The insights obtained could then be used to develop PA interventions for specific participant groups.

Lastly, the results of Study 3 suggest that AK may be a promising addition to exposure therapy for social anxiety, helping to reduce social avoidance. A number of researchers have argued that interventions that cultivate positive emotions may be beneficial in the treatment of affective disorders such as depression and anxiety (e.g., Fredrickson, 2000; Hofmann et al., 2011; Kashdan, 2004; Lyubomirsky & Dickerhoof, 2010; Seligman et al., 2006). These findings lend support to this perspective and suggest that techniques designed to increase PA may lead to beneficial changes even in the absence of group-level hedonic enhancement. By investigating the impact of PA techniques in the treatment of social anxiety and other affective disorders, it will be possible to establish the full range of benefits associated with these techniques and further refine the approach taken when treating these disorders to maximize client gains.

6.1 Caveats and Future Directions

These studies have several notable strengths. Studies 1 and 2 were strongly grounded in the empirical literature and extended previous findings by considering subtypes of idiographic social goals for an anticipated social interaction. This facilitated the detection of relationships between affect and social goals that may not have been apparent with a simple approach/avoidance distinction. In addition, by replicating the model developed in Study 1 in a second participant sample, these studies were able to draw stronger conclusions based on replicable paths rather than over-interpreting spurious results. Study 3 also had a number of strengths, addressing several limitations in Alden and Trew's (2012) original study. Participant selection was more stringent, with a second pre-intervention assessment helping to ensure that all participants were experiencing a significant level of social anxiety. In addition, this study used an established multi-item measure to assess the frequency of positive social activities, improving on the single item measure used by Alden and Trew (2012). Study 3 also used a stronger multi-item

measure of state affect and included measures of social approach and avoidance goals and state-level social anxiety in the online report forms, helping to clarify the pattern of change in these variables over time. The frequency of these online assessments was also increased from once to twice a week, providing more data for the multilevel modelling analyses. Further, the assessment of several potential mediators helped to identify mechanisms of change in social avoidance goals (i.e., social anxiety reduction) and better establish the range of benefits associated with both AK and SA. Lastly, the use of a self-directed analogue of graduated social exposure in place of behavioural experiments reduced the complexity of the task requirements for participants and provided a stronger comparison condition for evaluating the effectiveness of AK.

These studies also had several limitations that should be taken into consideration when interpreting these findings. First, all three samples were comprised of well educated, highly functioning individuals with largely sub-clinical levels of social interaction anxiety (particularly in Studies 1 and 2). It is possible that a different pattern of relationships would emerge in a clinical sample. Further, all of the samples used in this dissertation were primarily female. It is conceivable that a different pattern of relationships may emerge in a male sample. It is also unclear whether these results can be extended to other social situations (in the case of Studies 1 and 2) or to social performance anxiety. Future research should consider whether these findings can be replicated in other clinical and non-clinical samples and in other social contexts (e.g., public speaking) and whether demographic variables such as gender and culture have a meaningful effect on the results.

Further, all three studies relied entirely on self-report measures. It would be valuable to determine whether social goals have an impact on observable social behaviour and physiological and affective responses to actual social interactions. This would help to establish the functional

impact of these goals and the full range of benefits associated with modifying these goals using techniques such as AK. As these studies focused on PA and NA, it would also be beneficial to determine whether these findings can be extended to less activated forms of affect (e.g., contentment or sadness). Future research should also consider whether the use of a social threat induction (e.g., a public speaking task) increases the range and predictive ability of NA in the model supported by Studies 1 and 2.

In addition, while the detailed goal coding system used in Studies 1 and 2 captures subtle nuances in the idiographic social goals listed by the participants, the use of this goal coding system decreases comparability to other studies that focus on a simple approach/avoidance distinction and may have limited the relationship between approach and avoidance goals. Further, the nomothetic social goals measure used in Study 3 had relatively low internal consistency, particularly in the online report forms. It would be advantageous to replicate these findings using a different measure of approach and avoidance goals. For example, Holtforth and Grawe have developed a measure of approach and avoidance goals relevant to clinical problems and motivation in psychotherapy (Grosse Holtforth & Grawe, 2000; Holtforth, 2008; Holtforth & Grawe, 2003). If a similar pattern of results can be obtained using alternate measures of approach and avoidance goals, this will provide further support for the role of PA in goal selection and the efficacy of AK as an avoidance reduction strategy. It may also be beneficial to develop new measures that assess specific subcategories of approach and avoidance goals.

The correlational research designs of Studies 1 and 2 and the mediation analyses in Study 3 also leave us unable to draw causal conclusions. Although testing an alternate model in Studies 1 and 2 suggested that affect likely predicts goals and not vice versa, it is not possible to claim that affect has a causal impact on goal selection. Future studies that include multiple assessment

time-points would help to establish causal relationships between the variables and determine whether the proposed mediators, particularly social anxiety reduction, drive changes in affect and motivation.

In addition, as Study 3 used a single PA technique, it is unclear whether a different PA technique (e.g., counting one's blessings) would be effective at reducing social avoidance goals or whether this effect is specific to AK. Future studies should investigate whether additional PA techniques are effective at shifting the balance of approach and avoidance goals. Future research should also seek to determine why engaging in acts of kindness led to a faster reduction in avoidance goals relative to SA. As mentioned above, potential reasons include more positive expectancies and decreased perceptions of threat. This research may point us in the direction of other beneficial avoidance reduction strategies and may help us to identify ways to increase client engagement in social exposure exercises. Also, to minimize participant burden in Study 3, the online report forms only assessed affect, social goals, and state-level social anxiety. As a result, it is unclear how relatedness need satisfaction, self-esteem, and the frequency of positive social interactions change over time. Future studies may wish to explore these change trajectories. Lastly, Study 3 examined change over a four week period. It remains to be seen whether the changes observed here would persist over longer periods of time and whether additional changes would be detected with a longer intervention (e.g., changes in social avoidance goals and NA in the SA condition).

As noted above, future research should also focus on identifying additional predictors of social avoidance goals to refine the model developed in Studies 1 and 2 and should examine the boundary conditions for PA techniques such as AK to determine when these techniques are most likely to lead to noticeable PA enhancement. It may also be beneficial to identify ways to

143

increase perceptions of autonomy when asking participants to engage in PA interventions. Approaches such as motivational interviewing (Miller & Rollnick, 1991) may provide guidance regarding strategies that will help to enhance perceptions of autonomy and maximize the benefits associated with these techniques. Lastly, future research should investigate whether PA techniques such as AK are effective at promoting more adaptive goals in other conditions characterized by avoidance (e.g., depression; Trew, 2011) and whether incorporating AK into graduated social exposure enhances treatment outcomes in social anxiety.

6.2 Closing Statement

Social interaction anxiety is associated with a range of negative social and emotional outcomes. These negative outcomes may be attributable, in part, to a combination of high social avoidance and low social approach. The present studies indicate that approach and avoidance processes in social interaction anxiety can be understood using a hierarchical framework, with momentary PA inversely predicting social avoidance goals. Further, Study 3 indicates that engaging in acts of kindness is an effective way to reduce these social avoidance goals. These studies represent an important first step in identifying predictors of social approach and avoidance goals and strategies that are effective at changing these goals. By using a range of interventions to alleviate distress, reduce social avoidance goals, and improve social and emotional well-being, it may be possible to help socially anxious individuals overcome social avoidance and lead more satisfying and engaging lives.

Table 1

Means and Standard Deviations (in Parentheses) for Studies 1 and 2

	Study 1	Study 2
BIS Sensitivity	20.51 (3.73)	21.37 (3.36)
BAS Sensitivity	40.23 (4.75)	40.19 (4.80)
SIAS	25.34 (12.80)	26.85 (13.20)
PA	24.73 (7.31)	25.19 (8.01)
NA	14.25 (5.24)	13.92 (5.11)
Avoidance Goals	0.11 (0.14)	0.12 (0.14)
Approach Goals	0.28 (0.23)	0.32 (0.22)

Note. BIS = Behavioural Inhibition System, BAS = Behavioural Activation System, SIAS =

Social Interaction Anxiety Scale, PA = Positive Affect, NA = Negative Affect.

Table 2

Intercorrelations between the Variables for Studies 1 and 2

	1.	2.	3.	4.	5.	6.	7.
1. BIS Sensitivity	1.00	-.05	.33***	-.17*	.26***	.10	-.01
2. BAS Sensitivity	-.07	1.00	-.15*	.21**	.09	-.01	.02
3. SIAS	.49***	-.22**	1.00	-.25***	.29***	.15*	-.13
4. PA	-.32***	.22**	-.31***	1.00	.03	-.21**	.02
5. NA	.26***	-.04	.31***	.06	1.00	.04	-.10
6. Avoidance goals	.10	-.01	.13	-.17*	.05	1.00	-.24***
7. Approach goals	-.22**	.05	-.30***	.18*	-.18*	-.30***	1.00

Note. Correlations from Study 1 appear below the diagonal and correlations from Study 2 appear above the diagonal. BIS = Behavioural Inhibition System, BAS = Behavioural Activation System, SIAS = Social Interaction Anxiety Scale, PA = Positive Affect, NA = Negative Affect.

$* p < .05$, $** p < .01$, $*** p < .001$

Table 3

Path Coefficients and Confidence Intervals (in Parentheses) for the Saturated Model from

Study 1

Pathway	Coefficient
Correlations	
Correlation between BIS and BAS Sensitivity	-0.06 (-0.20, 0.08)
Residual Correlation between NA and PA	0.20 (0.06, 0.27)*
Residual Correlation between Approach and Avoidance Goals	-0.26 (-0.34, -0.13)*
Predictors of SIAS	
BIS Sensitivity	0.48 (0.37, 0.59)*
BAS Sensitivity	-0.19 (-0.29, -0.08)*
Predictors of PA	
BIS Sensitivity	-0.25 (-0.38, -0.12)*
BAS Sensitivity	0.18 (0.07, 0.30)*
SIAS	-0.16 (-0.29, -0.02)*
Predictors of NA	
BIS Sensitivity	0.14 (-0.01, 0.29)
BAS Sensitivity	0.02 (-0.10, 0.13)
SIAS	0.23 (0.08, 0.37)*
Predictors of Avoidance Goals	
BIS Sensitivity	-0.003 (-0.14, 0.13)
BAS Sensitivity	0.05 (-0.08, 0.17)
SIAS	0.09 (-0.04, 0.25)
PA	-0.16 (-0.27, -0.04)
NA	0.03 (-0.09, 0.16)
Predictors of Approach Goals	
BIS Sensitivity	-0.07 (-0.22, 0.07)
BAS Sensitivity	-0.03 (-0.16, 0.09)
SIAS	-0.20 (-0.33, -0.07)*
PA	0.10 (-0.02, 0.23)
NA	-0.11 (-0.23, -0.01)

Note. Standardized path coefficients are presented with 90% bootstrapped confidence intervals

based on 5000 resamples in parentheses. BIS = Behavioural Inhibition System, BAS =

Behavioural Activation System, SIAS = Social Interaction Anxiety Scale, PA = Positive Affect,

NA = Negative Affect.

*$p < .05$ based on the results of the standard path analysis

Table 4

Means and Standard Deviations (in Parentheses) for the Pre-Screening and Initial Session

Measures for the Study 3 Completers and Non-Completers

	Completers	Non-Completers
Pre-screening SIAS	45.86 (10.01)	44.50 (4.04)
Pre-screening SIAS-S	35.36 (7.70)	28.50 (3.54)
Initial Session SIAS	43.57 (9.58)	40.43 (5.03)
Initial Session PA	29.15 (7.56)	31.43 (5.94)
Initial Session NA	27.32 (7.98)	23.29 (5.50)
Initial Session SGQ Avoidance	22.06 (5.95)	23.57 (5.13)
Initial Session SGQ Approach	22.37 (6.15)	26.57 (5.80)
Initial Session BPNS-R	40.61 (7.23)	44.22 (4.65)
Initial Session RSES	41.71 (12.31)	49.14 (8.53)
Initial Session DSA	15.47 (5.64)	11.29 (2.36)
Initial Session IOS Approach	40.73 (12.40)	47.29 (11.16)

Table 5

Pre- and Post-Intervention Means and Standard Deviations (in Parentheses) for the Primary

Analysis Measures for Study 3 by Condition

	Positive Affect	
	Pre-Intervention	Post-Intervention
Acts of Kindness	30.18 (8.21)	28.45 (7.14)
Decreasing Social Avoidance	30.41 (7.33)	30.24 (8.75)
Life Details	26.64 (6.61)	28.39 (6.92)
	Negative Affect	
	Pre-Intervention	Post-Intervention
Acts of Kindness	27.32 (7.69)	23.58 (7.16)
Decreasing Social Avoidance	27.95 (7.51)	23.25 (8.38)
Life Details	26.61 (8.90)	24.86 (8.94)
	Social Avoidance Goals	
	Pre-Intervention	Post-Intervention
Acts of Kindness	23.26 (4.54)	17.34 (6.38)
Decreasing Social Avoidance	21.02 (6.91)	19.09 (6.88)
Life Details	21.97 (6.02)	19.69 (7.27)
	Social Approach Goals	
	Pre-Intervention	Post-Intervention
Acts of Kindness	23.58 (7.40)	21.78 (5.87)
Decreasing Social Avoidance	22.38 (4.73)	22.61 (7.17)
Life Details	21.09 (6.04)	20.42 (5.51)

Table 6

Means and Standard Deviations (in Parentheses) for the Primary Multilevel Modelling Analyses for Study 3 by Group

	Positive Affect								
	Initial Session	Report 1	Report 2	Report 3	Report 4	Report 5	Report 6	Report 7	Report 8
AK	15.05 (4.39)	14.74 (3.62)	14.00 (3.08)	13.56 (3.98)	14.23 (3.24)	13.50 (3.68)	14.20 (3.89)	13.40 (3.68)	13.11 (3.11)
SA	15.54 (3.83)	14.98 (3.39)	14.25 (3.91)	13.86 (4.36)	12.83 (4.73)	13.03 (4.73)	12.69 (3.79)	13.86 (4.54)	14.41 (4.62)
LD	13.60 (3.78)	13.35 (3.42)	14.33 (3.79)	12.96 (3.90)	13.92 (4.23)	12.79 (5.00)	12.93 (4.45)	13.20 (3.63)	12.90 (3.43)
	Negative Affect								
	Initial Session	Report 1	Report 2	Report 3	Report 4	Report 5	Report 6	Report 7	Report 8
AK	13.08 (4.04)	10.86 (3.67)	11.63 (3.35)	10.97 (3.95)	10.52 (3.61)	12.04 (3.89)	10.83 (3.43)	10.13 (3.40)	10.50 (3.21)
SA	13.41 (3.95)	11.60 (3.67)	10.99 (3.54)	11.06 (4.25)	10.75 (3.93)	10.76 (3.51)	11.31 (4.04)	11.09 (3.96)	9.82 (3.39)
LD	12.50 (4.80)	11.26 (3.60)	11.73 (4.18)	11.37 (3.63)	12.50 (4.35)	11.81 (4.28)	11.07 (4.04)	11.58 (4.44)	11.19 (3.26)
	Social Avoidance Goals								
	Initial Session	Report 1	Report 2	Report 3	Report 4	Report 5	Report 6	Report 7	Report 8
AK	23.26 (4.54)	17.71 (5.04)	18.65 (5.28)	17.31 (6.54)	17.10 (6.08)	16.73 (5.65)	16.08 (5.70)	15.77 (5.43)	14.11 (4.87)
SA	21.02 (6.91)	21.19 (6.01)	19.03 (5.99)	17.83 (7.26)	18.19 (7.34)	17.65 (7.16)	17.66 (6.88)	17.46 (6.59)	16.17 (6.87)
LD	21.97 (6.02)	18.39 (6.46)	17.60 (6.40)	16.37 (6.10)	18.31 (6.65)	16.41 (7.03)	17.50 (7.60)	17.12 (7.74)	17.38 (6.38)

Table 6 (con't)

	Social Approach Goals								
	Initial Session	Report 1	Report 2	Report 3	Report 4	Report 5	Report 6	Report 7	Report 8
AK	23.58 (7.40)	19.71 (4.59)	18.94 (5.21)	18.13 (5.92)	17.58 (5.46)	18.38 (6.09)	18.46 (6.29)	18.10 (6.50)	17.23 (6.60)
SA	22.38 (4.73)	20.43 (5.09)	19.40 (5.41)	17.83 (6.23)	17.31 (6.25)	17.88 (5.61)	18.67 (6.15)	19.57 (5.82)	18.73 (7.08)
LD	21.09 (6.04)	19.76 (5.50)	19.97 (5.65)	16.85 (5.27)	17.32 (6.31)	18.11 (7.03)	16.39 (6.34)	17.58 (6.84)	17.19 (6.71)

Note: AK = Acts of Kindness, SA = Decreasing Social Avoidance, LD = Life Details.

Table 7

Unstandardized Coefficients (Standard Errors in Parentheses) and T-Values for the Fixed Effects from the Primary Multilevel

Modelling Analyses for Study 3

Effect	Positive Affect		Negative Affect		Social Avoidance		Social Approach	
	Coefficient	T-Value	Coefficient	T-Value	Coefficient	T-Value	Coefficient	T-Value
β_{00} – Intercept	14.18 (0.25)	57.54*	11.39 (0.25)	46.37*	18.65 (0.38)	49.38*	19.25 (0.36)	52.86*
β_{01} – Initial Session	0.50 (0.06)	8.04*	0.48 (0.06)	8.31*	0.60 (0.06)	9.35*	0.47 (0.06)	7.81*
β_{02} – AK vs. LD	0.02 (0.62)	0.03	-0.74 (0.62)	-1.20	0.23 (0.95)	0.24	-0.82 (0.92)	-0.88
β_{03} – SA vs. LD	-0.33 (0.61)	-0.53	-0.80 (0.60)	-1.34	3.12 (0.93)	3.36*	-0.25 (0.89)	-0.28
β_{0**} – SA vs. AK	-0.34 (0.59)	-0.58	-0.07 (0.59)	-0.11	2.89 (0.92)	3.14*	0.57 (0.88)	0.65
β_{10} – Slope of Time	-0.15 (0.05)	-3.01*	-0.05 (0.05)	-0.88	-0.35 (0.08)	-4.45*	-0.18 (0.07)	-2.46*
β_{11} – Initial Session	-0.00 (0.01)	-0.10	-0.02 (0.01)	-1.61	-0.02 (0.01)	-1.54	0.00 (0.01)	0.20
β_{12} – AK vs. LD	-0.07 (0.13)	-0.58	-0.11 (0.13)	-0.86	-0.39 (0.19)	-2.00*	-0.01 (0.18)	-0.07
β_{13} – SA vs. LD	-0.02 (0.12)	-0.17	-0.03 (0.13)	-0.25	-0.48 (0.19)	-2.51*	0.10 (0.18)	0.58
β_{1**} – SA vs. AK	0.05 (0.12)	-0.42	0.08 (0.13)	0.63	-0.09 (0.19)	-0.48	0.12 (0.18)	0.66

Note. The significance of the t-values for the multilevel models is based on t-values greater than 2. AK = Acts of Kindness, SA = Decreasing Social Avoidance, LD = Life Details.

p < .05, ** contrasts conducted by recoding the grouping variable and rerunning the analysis

Table 8

Pre- and Post-Intervention Means and Standard Deviations (in Parentheses) for the

Secondary Analysis Measures for Study 3 by Condition

	Satisfaction of Relatedness Needs	
	Pre-Intervention	Post-Intervention
Acts of Kindness	40.87 (7.70)	41.55 (6.40)
Decreasing Social Avoidance	41.25 (8.15)	44.55 (6.54)
Life Details	39.58 (5.47)	40.93 (6.10)
	Self-Esteem	
	Pre-Intervention	Post-Intervention
Acts of Kindness	41.27 (11.90)	45.03 (12.03)
Decreasing Social Avoidance	43.59 (12.79)	50.33 (11.18)
Life Details	40.03 (12.25)	43.24 (9.60)
	Daily Social Anxiety	
	Pre-Intervention	Post-Intervention
Acts of Kindness	15.24 (4.52)	10.58 (6.12)
Decreasing Social Avoidance	15.83 (6.56)	10.17 (6.22)
Life Details	15.31 (5.73)	13.33 (5.71)
	Positive Social Activities	
	Pre-Intervention	Post-Intervention
Acts of Kindness	40.82 (11.15)	46.01 (11.65)
Decreasing Social Avoidance	41.50 (14.54)	49.26 (11.54)
Life Details	39.77 (11.22)	42.30 (10.34)

Table 9

Means and Standard Deviations (in Parentheses) for the Multilevel Modelling Analysis of Daily Social Anxiety for Study 3 by

Group

	Initial Session	Report 1	Report 2	Report 3	Report 4	Report 5	Report 6	Report 7	Report 8
AK	15.24 (4.52)	10.56 (5.18)	12.41 (6.17)	10.52 (6.69)	10.38 (6.48)	10.27 (6.69)	10.23 (6.33)	9.46 (5.70)	8.19 (4.96)
SA	15.83 (6.56)	13.34 (6.33)	11.80 (6.37)	11.44 (5.84)	10.44 (7.13)	10.27 (6.79)	11.19 (6.16)	10.40 (6.42)	8.45 (6.08)
LD	15.31 (5.73)	11.91 (6.22)	11.87 (5.06)	11.04 (4.83)	12.29 (5.87)	10.45 (5.28)	11.32 (5.60)	11.08 (6.57)	11.59 (5.05)

*Note: AK = Acts of Kindness, SA = Decreasing Social Avoidance, LD = Life Details.

Table 10

Unstandardized Coefficients (Standard Errors in Parentheses) and T-Values for the Fixed Effects from the Multilevel Modelling Analysis of Daily Social Anxiety for Study 3

	Coefficient	T-Value
β_{00} – Intercept	11.96 (0.42)	28.80*
β_{01} – Initial Session DSA	0.59 (0.07)	8.07*
β_{02} – Acts of Kindness vs. Life Details	0.22 (1.04)	0.21
β_{03} – Decreasing Social Avoidance vs. Life Details	0.93 (1.02)	0.91
β_{0**} – Decreasing Social Avoidance vs. Acts of Kindness	0.71 (1.00)	0.71
β_{10} – Slope of Time	-0.31 (0.07)	-4.22*
β_{11} – Initial Session DSA	-0.02 (0.01)	-1.84
β_{12} – Acts of Kindness vs. Life Details	-0.41 (0.19)	-2.20*
β_{13} – Decreasing Social Avoidance vs. Life Details	-0.46 (0.18)	-2.51*
β_{1**} – Decreasing Social Avoidance vs. Acts of Kindness	-0.05 (0.18)	-0.27

Note. The significance of the t-values is based on t-values greater than 2. DSA = Daily Social Anxiety.

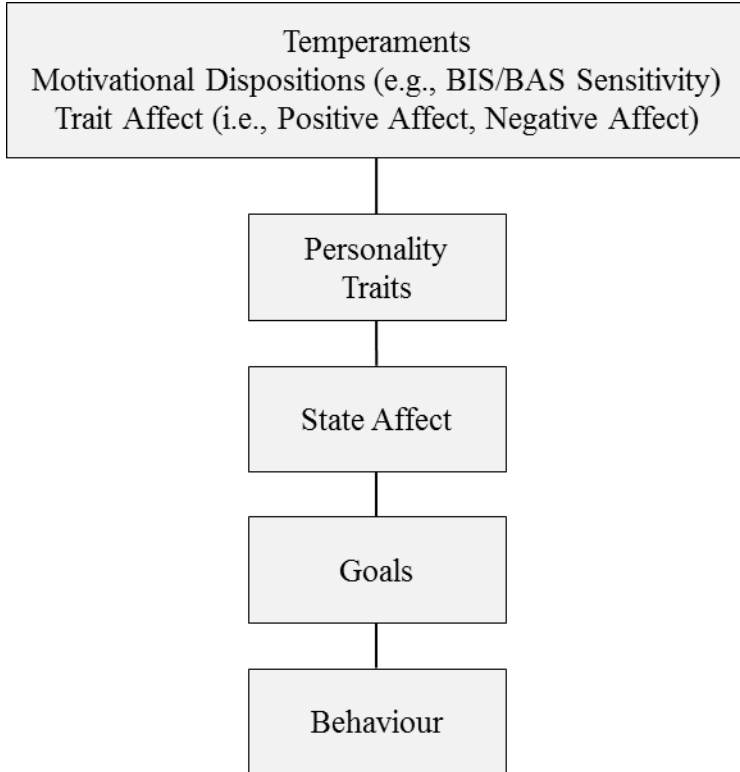*p < .05, ** contrasts conducted by recoding the grouping variable and rerunning the analysis

Figures

Figure 1. **Schematic Representation of the Relationship between the Motivational and Affective Variables Discussed in this Manuscript.** BIS = Behavioural Inhibition System, BAS = Behavioural Activation System.
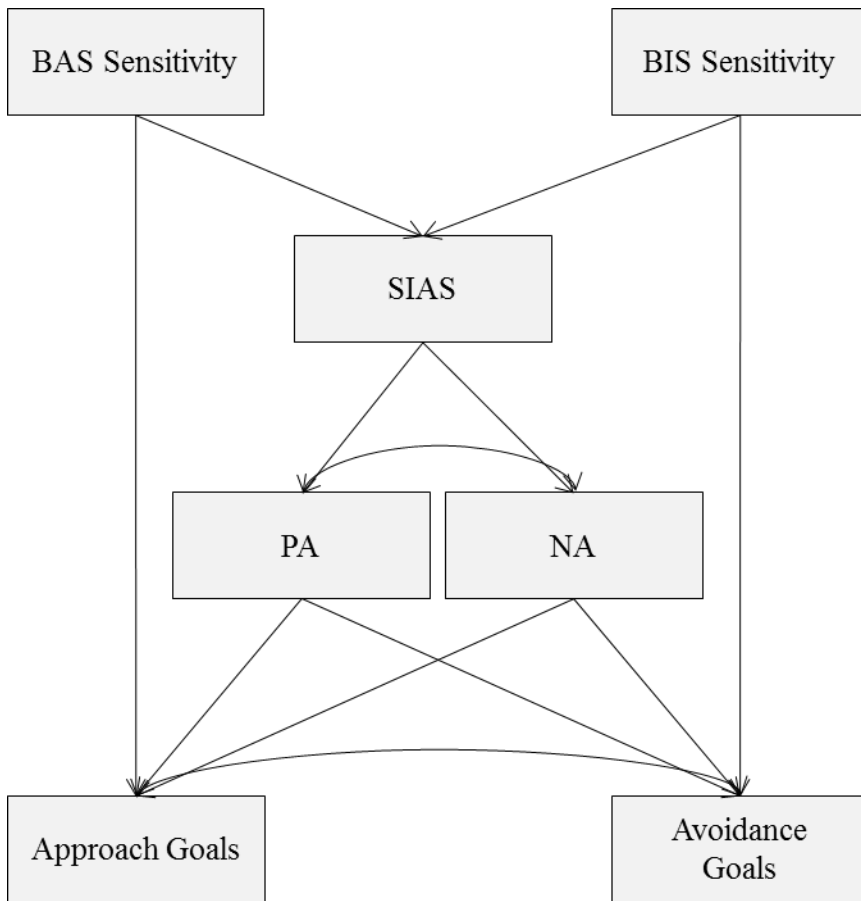
Figure 2. **Proposed Hierarchical Model.** Curved lines reflect covariances between residual

error terms. BIS = Behavioural Inhibition System, BAS = Behavioural Activation System, SIAS

= Social Interaction Anxiety Scale, PA = Positive Affect, NA = Negative Affect.

Figure 3. **Results for the Proposed Hierarchical Model.** Dashed lines indicate non-significant

paths. Curved lines reflect covariances between residual error terms. Standardized coefficients

with 90% bootstrapped confidence intervals are reported. BIS = Behavioural Inhibition System,

BAS = Behavioural Activation System, SIAS = Social Interaction Anxiety Scale, PA = Positive

Affect, NA = Negative Affect.
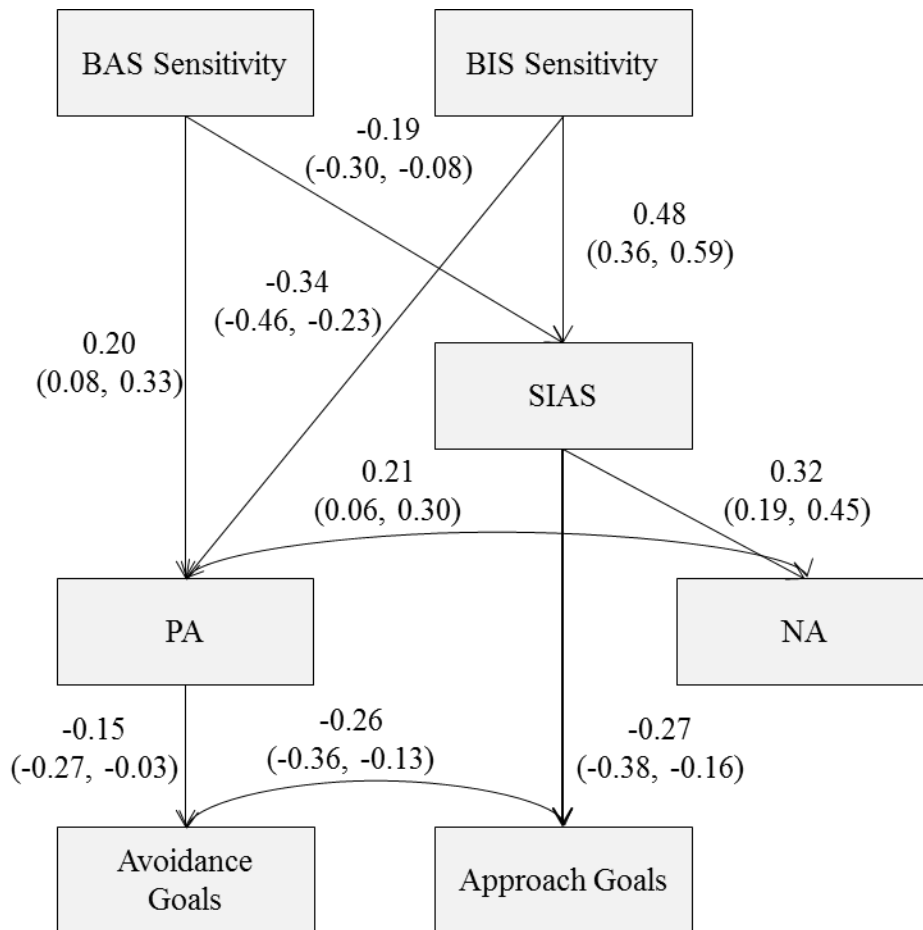
Figure 4. **Final Refined Model from Study 1.** Curved lines reflect covariances between residual error terms. Standardized coefficients with 90% bootstrapped confidence intervals are reported. BIS = Behavioural Inhibition System, BAS = Behavioural Activation System, SIAS = Social Interaction Anxiety Scale, PA = Positive Affect, NA = Negative Affect.
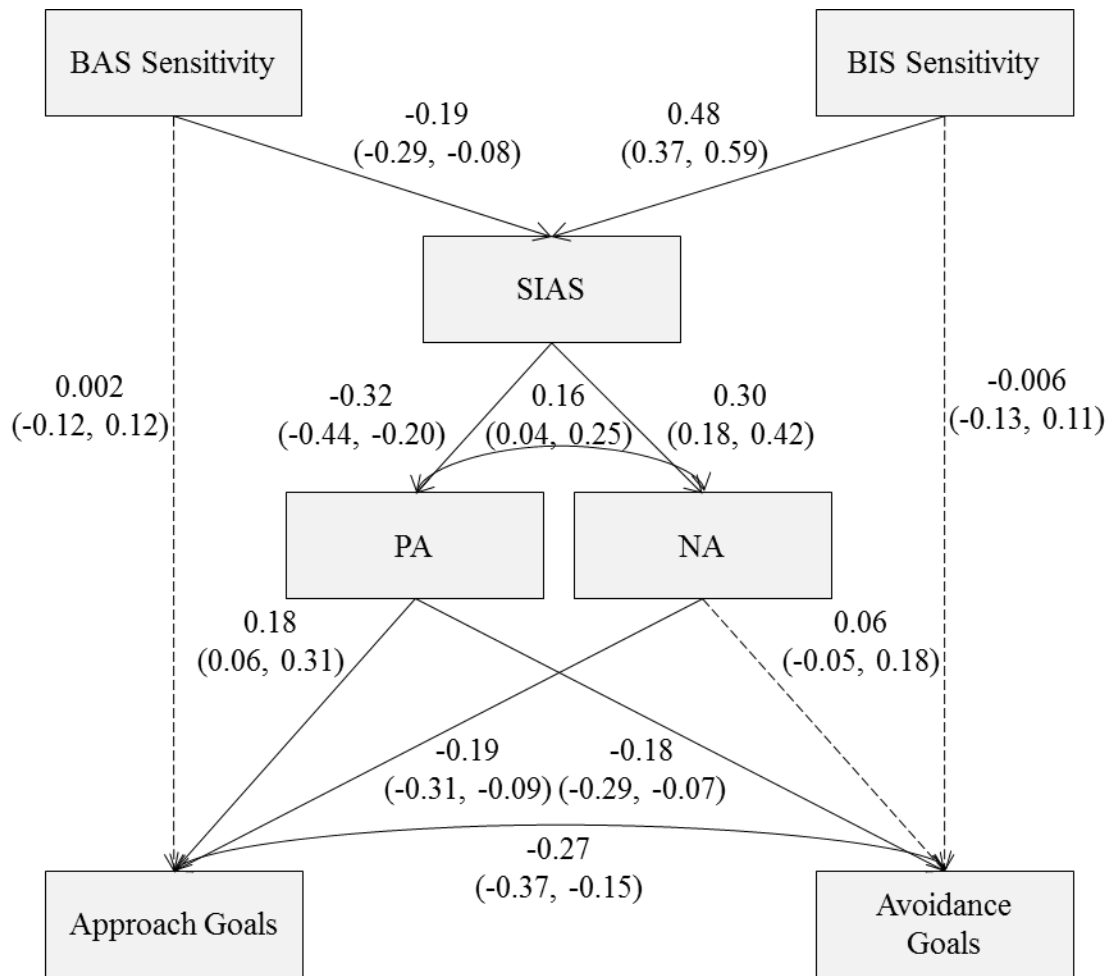
Figure 5. **Alternate Model from Study 1.** Curved lines reflect covariances between residual

error terms. Standardized coefficients with 90% bootstrapped confidence intervals are reported.

BIS = Behavioural Inhibition System, BAS = Behavioural Activation System, SIAS = Social

Interaction Anxiety Scale, PA = Positive Affect, NA = Negative Affect.
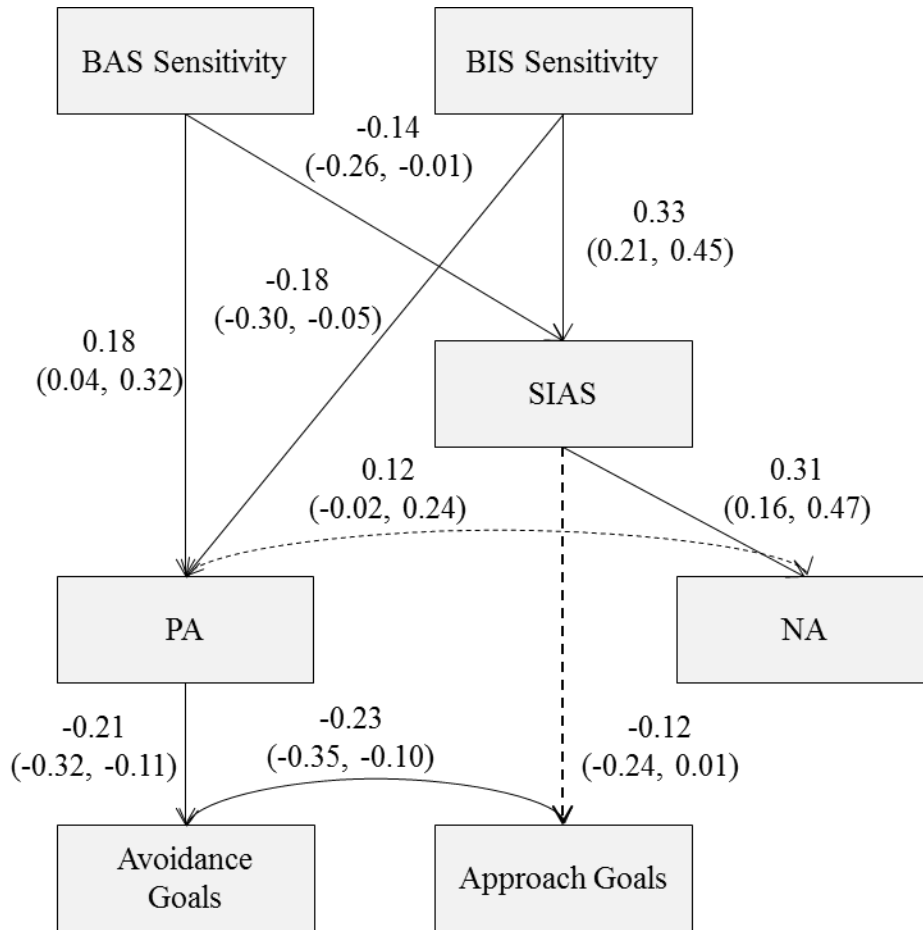
Figure 6. **The Model Developed in Study 1 Applied to Sample 2.** Dashed lines indicate non-significant paths. Curved lines reflect covariances between residual error terms. Standardized coefficients with 90% bootstrapped confidence intervals are reported. BIS = Behavioural Inhibition System, BAS = Behavioural Activation System, SIAS = Social Interaction Anxiety Scale, PA = Positive Affect, NA = Negative Affect.
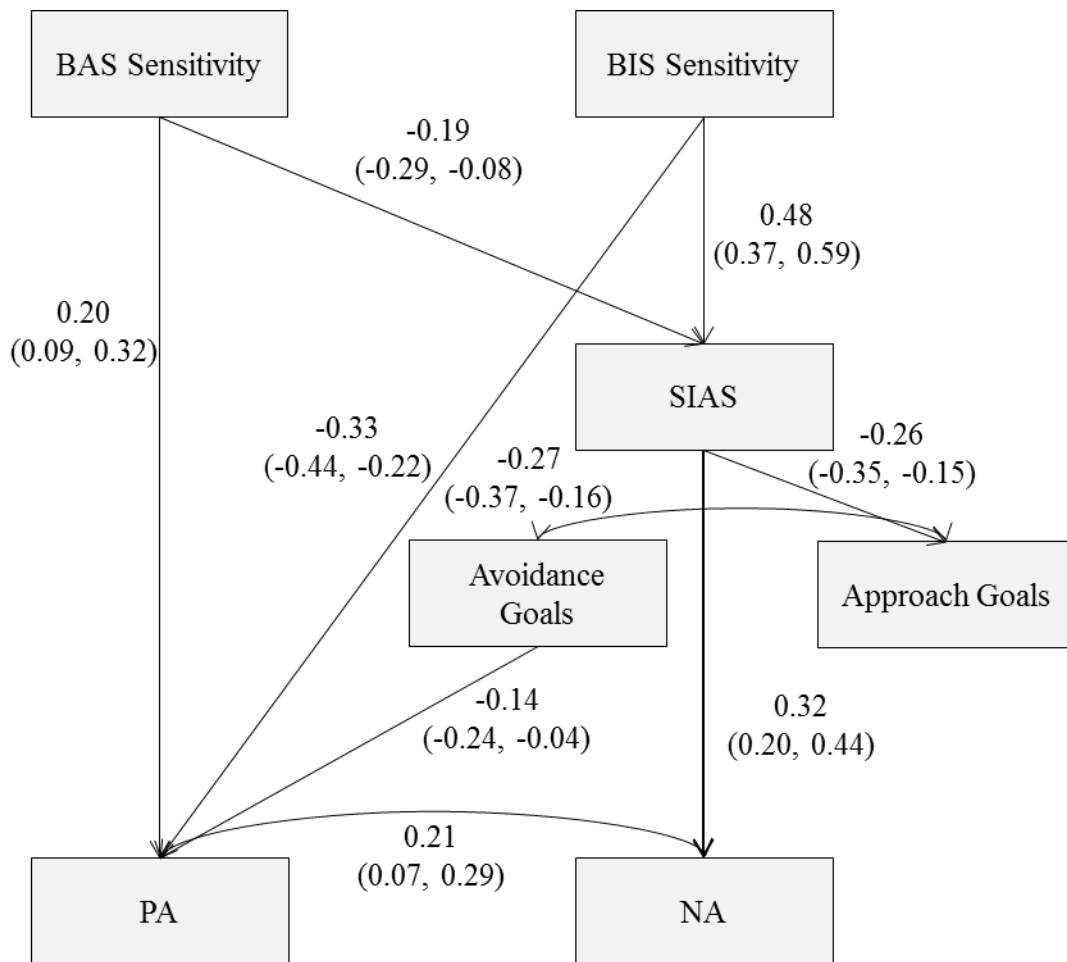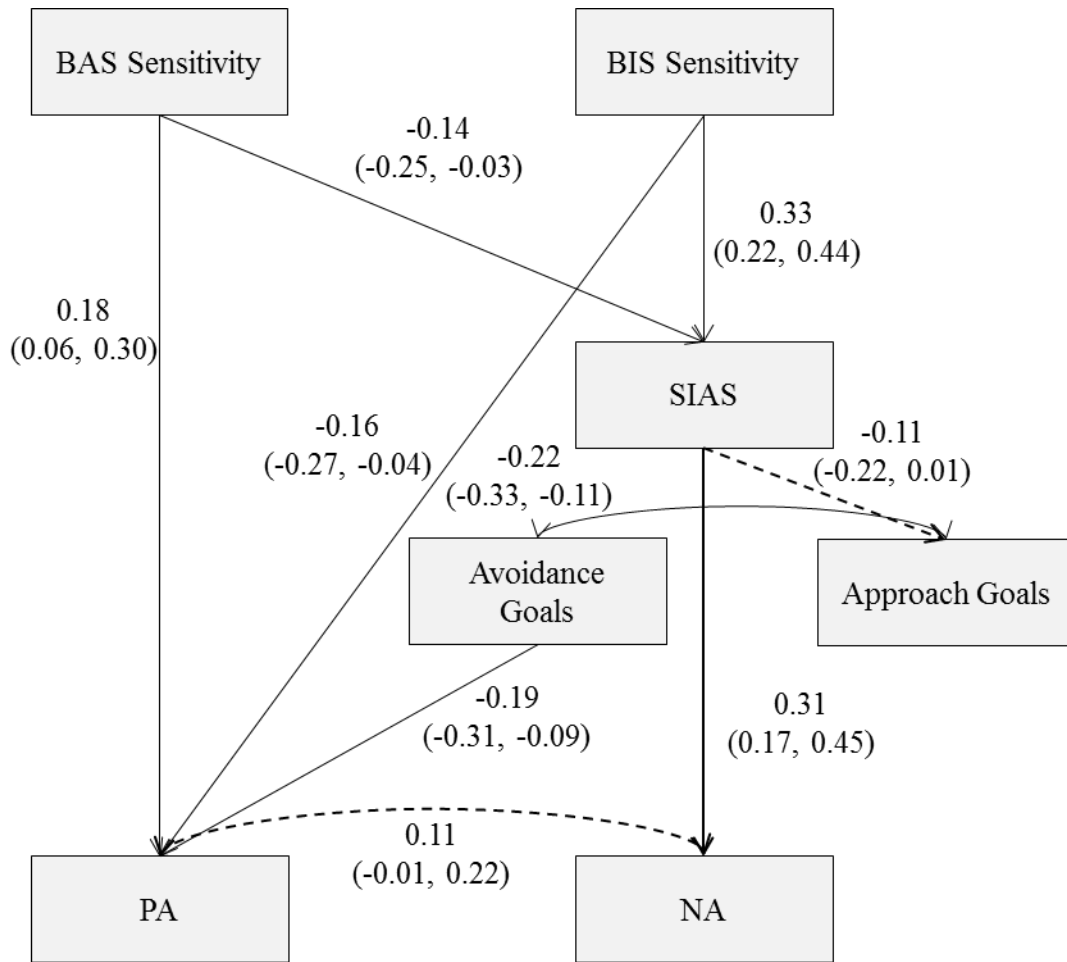
Figure 7. **The Alternate Model Developed in Study 1 Applied to Sample 2.** Dashed lines

indicate non-significant paths. Curved lines reflect covariances between residual error terms.

Standardized coefficients with 90% bootstrapped confidence intervals are reported. BIS =

Behavioural Inhibition System, BAS = Behavioural Activation System, SIAS = Social

Interaction Anxiety Scale, PA = Positive Affect, NA = Negative Affect.

Figure 8. **Mean Scores on the Measure of Positive Affect at Each Time Point by Task**

Condition. AK = Acts of Kindness, SA = Decreasing Social Avoidance, LD = Life Details.
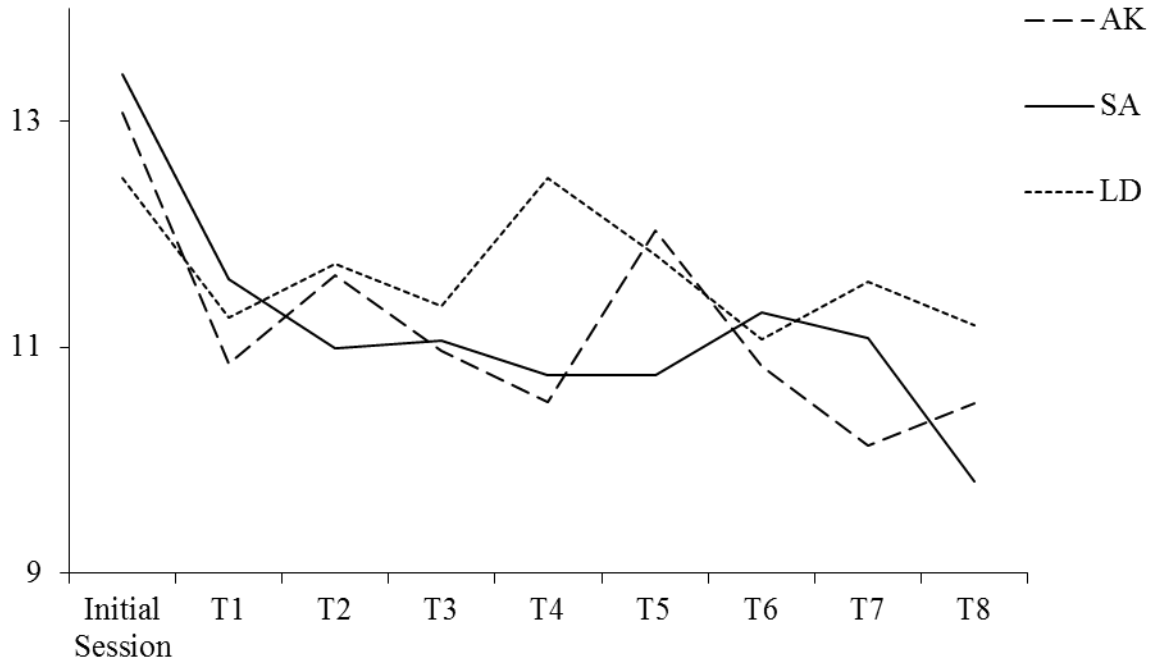
Figure 9. **Mean Scores on the Measure of Negative Affect at Each Time Point by Task**

Condition. AK = Acts of Kindness, SA = Decreasing Social Avoidance, LD = Life Details.
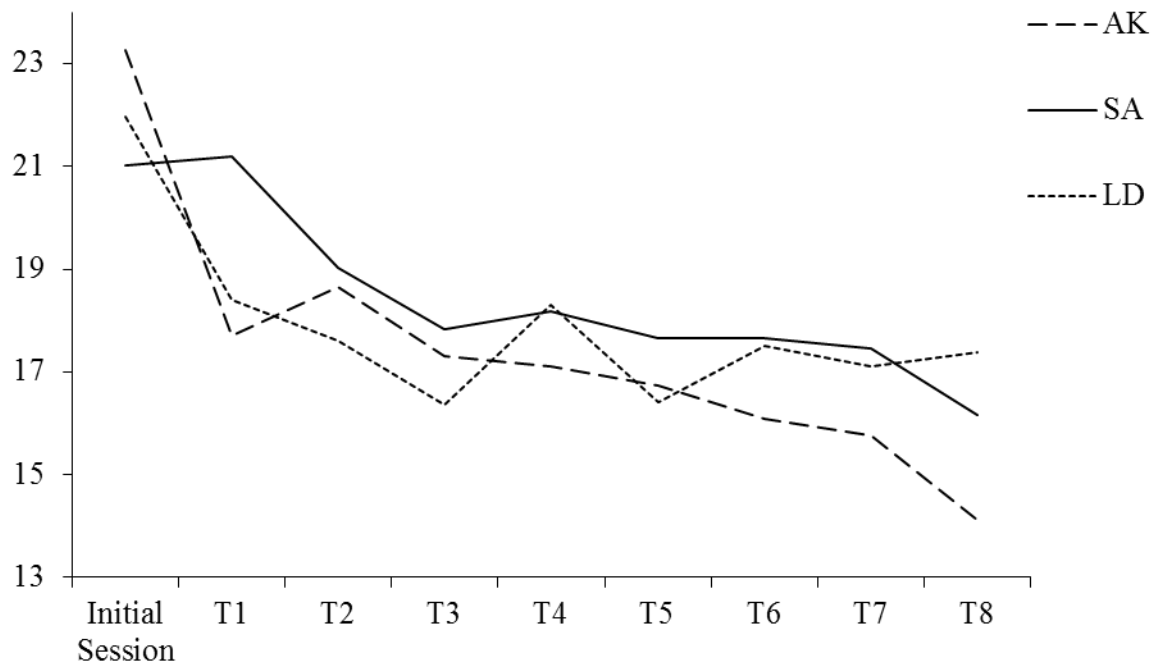
Figure 10. **Mean Scores on the Measure of Social Avoidance Goals at Each Time Point by**

Task Condition. AK = Acts of Kindness, SA = Decreasing Social Avoidance, LD = Life
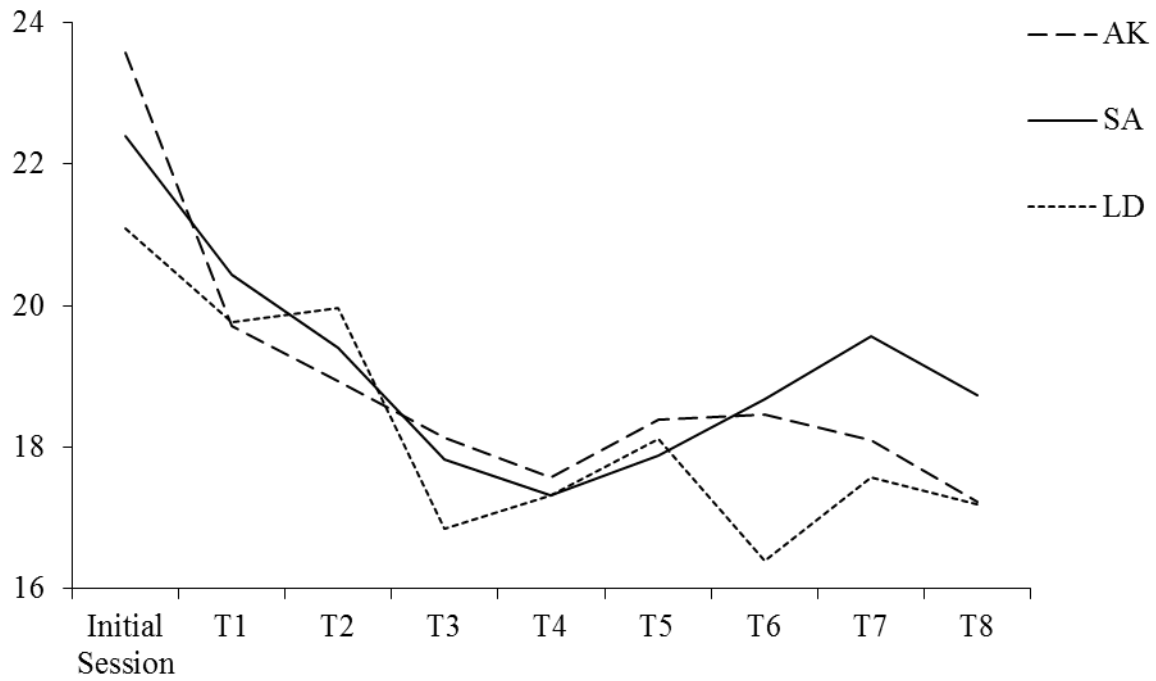
Details.

Figure 11. **Mean Scores on the Measure of Social Approach Goals at Each Time Point by**

Task Condition. AK = Acts of Kindness, SA = Decreasing Social Avoidance, LD = Life
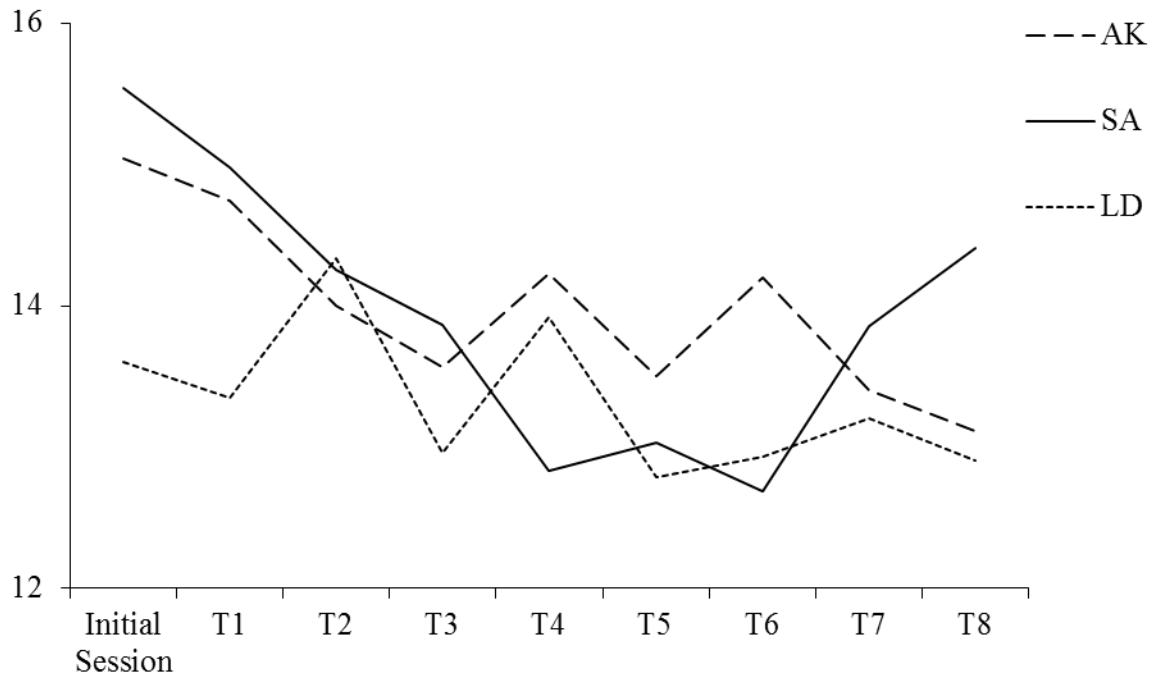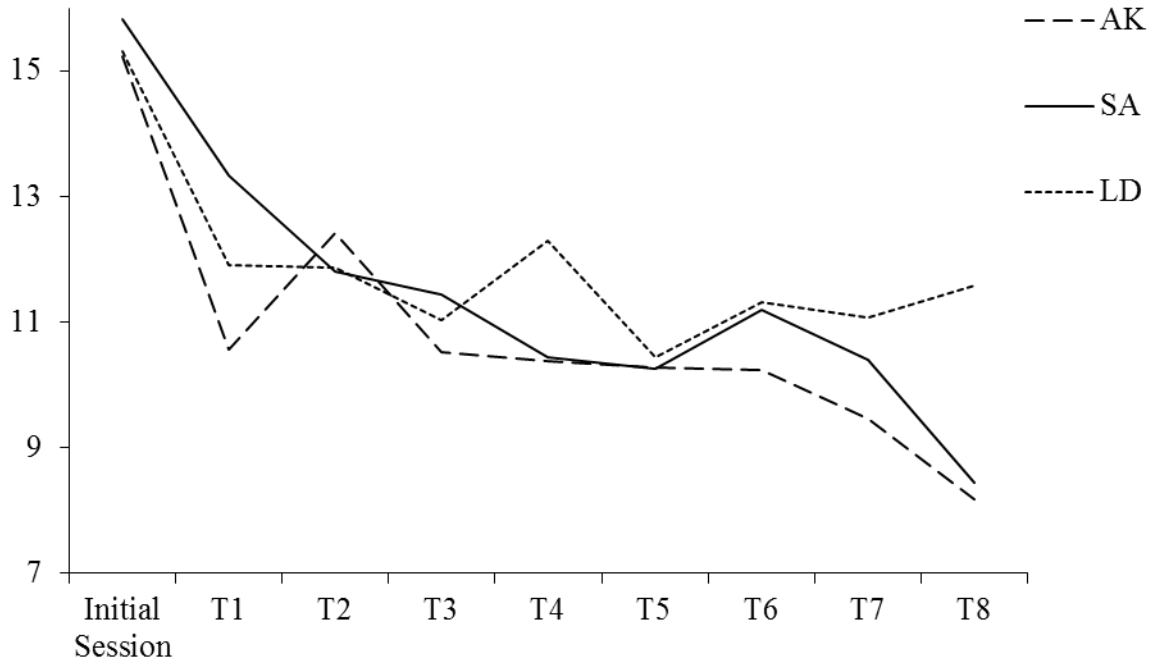
Details.

Figure 12. **Mean Scores on the Measure of Daily Social Anxiety at Each Time Point by**

Task Condition. AK = Acts of Kindness, SA = Decreasing Social Avoidance, LD = Life

Details.
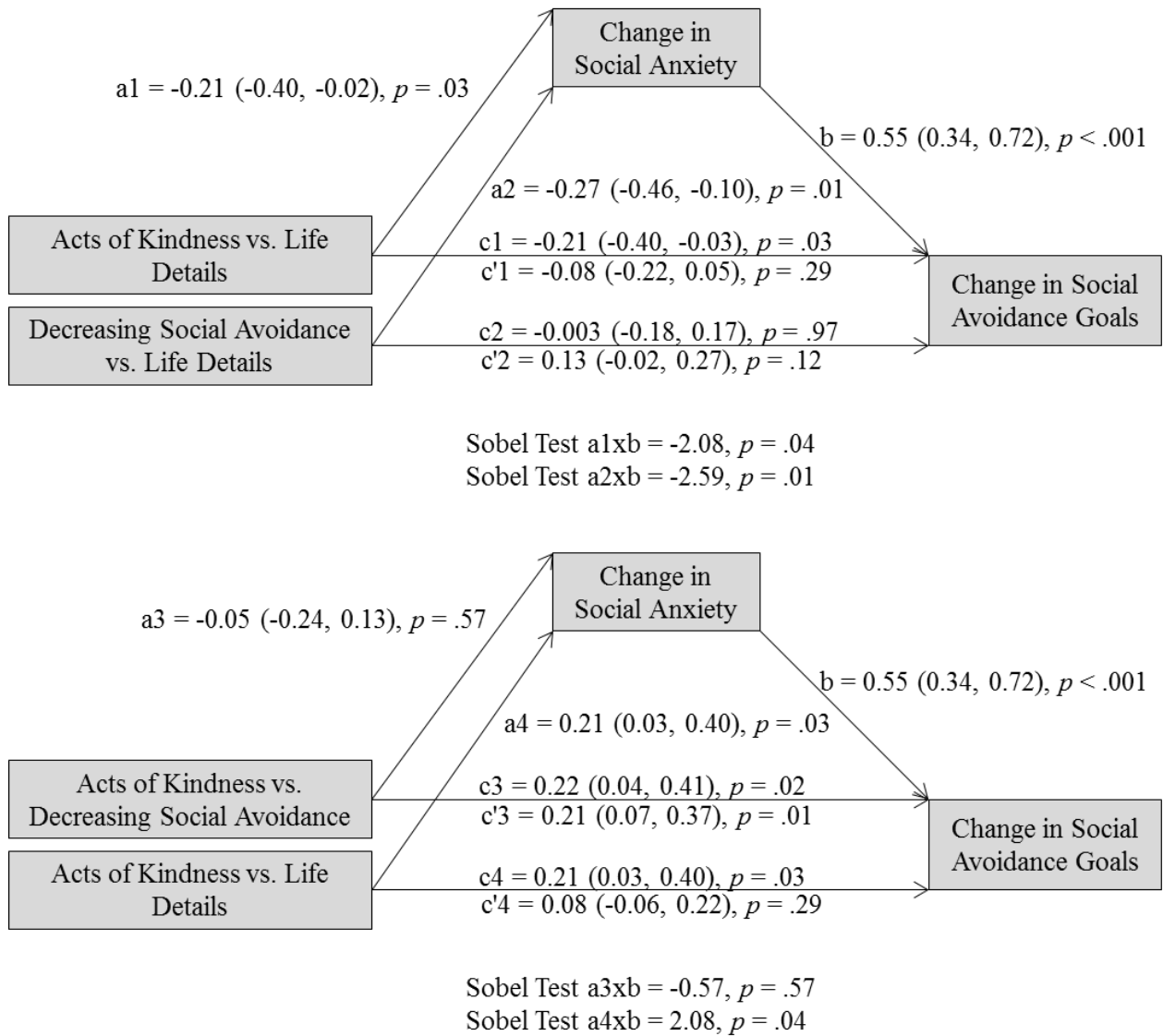
Figure 13. **Mediation Models Exploring the Potential Mediating Role of Change in Social**

Anxiety in the Intervention Effects Observed for Social Avoidance Goals. Standardized

regression coefficients are reported. Bootstrapped bias corrected and accelerated confidence

intervals are presented for the direct effects and Sobel tests are presented for the indirect effects.

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169

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Appendix A: Social Goals Elicitation Procedure

Personal Goals

We are interested in the goals that motivate people when they first talk with someone they don't know. In a few minutes, you will engage in a conversation with another student. Take a minute to think about what your "personal goals" would be for this interaction – that is, what you will try to accomplish during this conversation. Personal goals reflect what you are trying to do, regardless of whether you are successful or not.

People don't always think about the goals that drive their behaviour, so an example may be helpful. In a previous study, we asked people to list goals that they have at work. People listed a range of goals; for example:

> *I want to be effective at work.*
> *I want to say 'hi' to the receptionist on my way in each morning.*
> *I want to do well on my annual performance review.*
> *I want to check all of my email by nine in the morning.*
> *I want to show my boss that I am a good employee.*

Other goals listed included:

> *I want to avoid missing deadlines.*
> *I want to stop biting my nails during meetings.*
> *I want to avoid making mistakes.*
> *I want to stop accidentally throwing out progress reports.*
> *I do not want to feel inferior to my coworkers.*

It generally takes more than a few words to describe a goal, so please elaborate. Also, it can sometimes be difficult to think of specific goals since we don't automatically think about the goals we have for social interactions. It may help to think about what you want to do (or not do) during the interaction. This can be challenging and will likely take some time to complete. Do not worry about responding quickly – you will have as much time as you need.

On the next page, we would like you to list at least *5 personal goals* that you think *best* describe what you will be trying to do ***when you interact with your partner (i.e., the student that you are paired with)***.

While we ask that you try to write down at least 5 personal goals, you are welcome to write down more than 5 goals. When considering your personal goals, please be as open and honest as possible. Remember, your name will not be on this list and all of your responses will be kept completely *confidential*.

Now, please turn the page. When you have thought of your personal goals for the upcoming interaction, please write them down in the spaces provided on the "Your Personal Goals" page.

Your Personal Goals

In a few minutes, you will engage in a casual, 5-minute conversation with another student. What are your goals for this interaction? That is, what will you be trying to do during the interaction?

In the spaces below, please list *5 or more personal goals* that *best* describe what you will be trying to do while interacting with your conversational partner.

Personal Goal #1: _____

Personal Goal #2: _____

Personal Goal #3: _____

Personal Goal #4: _____

Personal Goal #5: _____

Personal Goal #6: _____

Personal Goal #7: _____

Personal Goal #8: _____

Personal Goal #9: _____

Personal Goal #10: _____

Personal Goal #11: _____

Personal Goal #12: _____

Personal Goal #13: _____

Personal Goal #14: _____

Personal Goal #15: _____

Appendix B: Goal Coding System Based on Content Analysis

Avoidance Goals

Avoidance goals focus on a negative possibility that a person is trying to move away from or stay away from. It is possible to identify a set of words or phrases that commonly appear in avoidance goals: not, no more, get away from, keep away from, stay away from, stop, omit, reduce, get out of, get rid of, prevent, turn away from, lose, avoid, escape, quit, be free from, refrain from, eliminate, squash, lessen, forget, do away with, _____ less. This set of words and phrases is meant to be illustrative, not exhaustive. Avoidance goals can be broken down into two categories:

1 = *Anxious Avoidance*
The anxious avoidance category was created to capture avoidance goals that strongly imply the presence of anxiety or social evaluative concerns. These goals focus on trying to prevent negative outcomes for the participant by minimizing anxious behaviours and avoiding errors that may lead the other person to evaluate the participant negatively (note that this excludes wanting to avoid offending the other person which is considered in the next category). Typical goals in this category involve wanting to avoid displaying anxious behaviour (do not fidget, do not look away) and avoid miscommunications and errors (e.g., avoid stuttering, do not make a mistake, don't say anything boring) that could lead to negative social evaluation. This category also includes goals that involve wanting to avoid having gaps or breakdowns in the conversation (e.g., do not run out of things to say, do not allow awkward pauses). Also included in this category are goals that involve wanting to avoid social discomfort or making a negative impression on others (e.g., do not say anything embarrassing, do not make the whole conversation awkward, do not be nervous, do not leave a bad impression, want to not feel judged). Goals to minimize intimacy or self-disclosure also apply (e.g., avoid revealing too much about myself) as they imply that such intimacy/disclosure will lead to negative evaluation.

2 = *Non-Anxious Avoidance*
The non-anxious avoidance category was created to capture avoidance goals that do not appear to reflect major social evaluative concerns. Instead, these goals focus on concerns other than social anxiety and being negatively evaluated by the other person. Many non-anxious avoidance goals focus on making sure that the participant does not offend their partner or make their partner uncomfortable (e.g., don't make partner angry), does not incite conflict (e.g., don't argue with them, avoid controversial topics), and does not dominate the conversation (e.g., don't talk only about myself). These goals are distinct from anxious avoidance goals in that they generally focus on avoiding negative outcomes for the other person or for the interaction, while anxious avoidance goals generally focus on avoiding negative outcomes for the participant themselves. Also included in this category are efforts to avoid being judgmental and to avoid coming across as rude or haughty (e.g., not to appear proud/annoying, do not make it seem I am superior).

Avoidance goals that focus on personal growth would also apply (e.g., do not focus on grammatical flaws – a pet peeve of mine), as would goals that focus on ensuring that the interaction is conversationally rich (e.g., don't focus on just one topic, don't talk about them only). Other goals may also apply. Note, however, that if it is not clear whether a goal should be classified as anxious avoidance or non-anxious avoidance, the goal should be classified as ambiguous.

Approach Goals
Structurally, approach goals focus on a positive possibility that a person is trying to move toward or maintain. We are making a distinction between several different types of approach goals:

3 = Prosocial Approach Goals
The prosocial approach category was created to capture goals that focus on making the other person comfortable and happy, fully engaging in the interaction, facilitating effective communication, getting to know the other person, sharing information with the other person, and building a connection with the other person. The main focus here is on the relationship and the conversational partner and the aim is to obtain positive outcomes for the other person, to facilitate a positive interaction and relationship building, and to ultimately reap the rewards of an effective interaction. Typical goals in this category involve trying to get to know the other person (e.g., get to know more about them), sharing information about themselves or reciprocating in the conversation (e.g., let them get to know me, respond by sharing my own experiences), and facilitating an effective interaction (e.g., let them talk, be flexible). This includes efforts to find common ground and to find conversational topics that will be interesting and engaging for both partners (e.g., try to find something interesting/common to talk about). This category also includes efforts to make the other person comfortable (e.g., be friendly, show respect, I want them to feel relaxed), efforts to be open and genuine with the other person (e.g., be myself, be honest), efforts to fully engage in the conversation (e.g., listen to what they have to say, be attentive, be an active listener), and efforts to build a connection with the other person (e.g., make a friend, find out what we have in common, be able to connect). Goals that focus on having a positive experience also apply under this category (e.g., enjoy myself, have an engaging conversation).

4 = Personal Approach Goals
This category of approach goals was created to capture approach goals that appear to benefit the participant more than they benefit their conversational partner or the interaction. Typical goals in this category involve practicing social skills (e.g., practice interacting with someone new for the first time, try to figure out what the other person is thinking), general learning (whether the focus is not necessarily on learning about the other person in particular; e.g., learn about other cultures), and self-improvement (e.g., be positive). Making a judgment about the other person would also be included in this category (e.g., decide if the other person is interesting). Other

goals in this category are clearly meant to benefit the participant (e.g., ask for help with a particular topic, promote dodgeball) or are social goals but are not specific to the upcoming interaction (e.g., I want to make more friends, I want to build my social network). Other goals may also apply – the key idea here is that the goal is largely self-focused.

5 = *Impression Management Goals*

This category of approach goals was created to capture efforts to influence the way that the conversational partner views the participant and how they react to the participant. Goals in this category generally focus on making a positive impression on the conversational partner and on behaving in certain ways to ensure that they make a positive impression. Typical goals in this category include general efforts to make a positive impression, efforts to come across a certain way (e.g., appear knowledgeable, come across as laid back), efforts to behave a certain way to create a positive impression (e.g., be awesome, be witty) or to demonstrate desirable traits to the other person (e.g., show confidence), and efforts to use specific behaviours to create a certain impression (e.g., try to show myself as a joyful and bright person by smiling and tone). Efforts to leave a lasting impression on the other person also apply (e.g., have them remember me, make them want to hang out with me). The focus here is on influencing the way that the conversational partner views the participant. Note, however, that there are a few exceptions to this general classification approach. Specifically, goals such as 'appear friendly' may be driven more by a desire to make the other person feel more comfortable rather than by a simple desire to make a positive impression on the other person. This makes this goal ambiguous. Similarly, goals such as 'appear interested' or 'look like I am paying attention' would be considered ambiguous for the same basic reason. These goals may be geared more toward obtaining positive outcomes for the other person or for the interaction rather than simply influencing the way that the other person views the participant. Also note that wanting the conversational partner to approve of or like the participant fits better under the Anxious Approach category.

6 = *Anxious Approach Goals*

This category of approach goals was created to capture goals that reflect subtle social evaluative concerns and efforts to behave in specific ways to counteract concerns about social evaluation. Many of the goals in this category focus on specific social micro-behaviours such as smiling or making eye contact that may counteract tendencies to appear anxious or to avoid eye contact. Other goals similarly focus on counteracting anxious behaviours (e.g., speak louder) or anxious emotional responses (e.g., be confident, relax). Goals in this category may also refer to wanting to 'fit in' or 'act normal', implying that the participant is concerned that this will not be the case. Other goals in this category appear to focus more on avoiding mistakes rather than ensuring a positive interaction (e.g., speak fluently, answer her questions clearly, respond to her questions appropriately). Also included in this category are goals that focus on ensuring that the participant does not run out of things to say and is able to get through the conversation without incident (e.g., find something to talk about, have enough topics to interact for 5 minutes, to make the 5

minutes go by quickly). Finally, this category also includes efforts to avoid intimacy that are phrased as approach goals (e.g., stay shallow, share as much info as I would put on my facebook page) and overt mention of wanting acceptance (e.g., want to be socially accepted, want them to like me). The overarching theme of this category is that all of the goals have undertones of social evaluation anxiety, despite being considered approach goals.

7 = *Information Focused Goals*
This category of approach goals was created to capture efforts to direct the conversation in specific ways by asking specific questions or discussing specific topics. This category has been included to allow for a distinction to be made between the prosocial goal of getting to know the other person better and the more ambiguous goals of asking specific questions or discussing specific topics. It is ultimately unclear whether these more specific informational goals are intended to increase the participant's overall understanding of their partner (i.e., a prosocial goal) or to ensure that the person will not run out of things to talk about (i.e., an anxious approach goal). Typical goals in this category include the intent to request specific information (e.g., ask his name, ask his major) and the intent to discuss specific topics (e.g., weather in Vancouver). Goals that mention a desire to engage in 'small talk' also apply as this limits the scope of the conversation and these goals often mention specific topics that the participant considers as falling under the rubric of 'small talk'. Importantly, if specific topics are mentioned in the context of a broader goal of getting to know the other person better, the goal should be coded as prosocial (e.g., get to know him better [e.g., major, interests etc.]). However, goals to 'find out basic information' about the other person are considered information focused as these goals appear to focus on getting answers to specific questions rather than getting to know the person more generally.

8 = *Ambiguous Goals*
This category was created to capture goals that do not fit cleanly into any one approach or avoidance category or appear to fit into multiple categories at the same time. This includes social approach goals that do not clearly reflect anxiety goals, impression management goals, prosocial goals, personal goals, or informational goals or that seem to reflect more than one type of approach goal. It also includes avoidance goals that may reflect either anxious or non-anxious avoidance goals. Essentially, if a goal cannot be easily classified according to one single category mentioned above, either because it may fit into more than one category, it has multiple elements and these elements clearly fit into different categories[41], it is not clear which category it

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[41] Note that not all goals with multiple elements are ambiguous. If the second half of the goal helps to clarify the nature of the first half of the goal (e.g., Have a smooth conversation by avoiding awkward pauses), the goal can be categorized accordingly. Goals with multiple elements are considered ambiguous when their elements are contradictory or clearly reflect different categories without clarifying the overall nature of the goal (e.g., make the other person comfortable and come across as intelligent). In general, a goal with multiple elements should be classified according to its first element unless the latter element(s) make the goal ambiguous or change(s) its overall tone or nature.

fits into, or it clearly does not fit any of the categories, it should be coded as an ambiguous goal. For example, it is not entirely clear whether 'be polite', 'be nice', or 'want the conversation to go smoothly' reflect prosocial goals or whether they reflect social evaluative concerns (i.e., that the participant will be rejected if they are not polite or nice or if the conversation does not go smoothly). Similarly, it is not clear whether goals such as 'introduce myself', 'remember the person's name', 'I will ask at least two questions', and 'compliment them' are meant to facilitate the interaction (i.e., prosocial) or are behavioural imperatives driven by an anxious concern that the participant will fail to do so and that negative outcomes will ensue as a result. 'Not talk fast' is another example, where it is not clear whether this is meant to counter an anxious behaviour or a behaviour that the participant wants to work on as part of self-improvement. For other goals, it may not be clear what the participant intended when they wrote the goal down. For example 'happy', 'confident', and 'I am energetic' could refer to impression management goals, but this is far from clear. When in doubt, go with this category.

9 = *Non-Social / Irrelevant*
This category was created to capture goals that are external to the immediate study and/or that are external to the interaction task itself. Most goals in this category are fully external to the study and do not relate to the interaction at hand (e.g., lose 5 more pounds, work-out). Other goals in this category are relevant to the study but are not relevant to the interaction task itself (e.g., do enough to get my credits, finishing the study, make it to my class in time). Goals that stand out as not being genuinely relevant to the interaction task also apply (e.g., I will NOT mention polar bears).

Goal Codes and Categories.

1	Anxious Avoidance
2	Non-anxious Avoidance
3	Prosocial Approach
4	Personal Approach
5	Impression Management Approach
6	Anxious Approach
7	Informational
8	Ambiguous
9	Irrelevant/Non-Social

Appendix C: Task Instructions and Examples

Performing Acts of Kindness

Kind acts are behaviours that benefit others or make others happy, typically at some cost to oneself. These acts may be large or small and the recipient of the act may or may not be aware that you have done anything for them. Examples of kind acts include feeding a stranger's parking meter, donating blood, helping a friend with homework, visiting an elderly relative, or writing a thank-you letter. While individuals differ in how often they perform acts of kindness, we all perform kind acts in our daily lives.

Take a moment and think about your own life. What kind acts have you performed recently? Are there any kind acts that you would like to perform more often? For this exercise, we'd like you to perform several acts of kindness each week. First, take a look at the list of kind acts that has been provided on the next page and identify 9-15 acts of kindness that you would like to try over the next four weeks. The acts that you have chosen can be listed on the third page. Then:

1. Pick **two days** during the week to perform kind acts.

2. On *each* of these days, perform **three acts of kindness** for a total of 6 acts per week. Observe how you feel and how the other person responds (if they are present).

3. Compare how you felt on days when you engaged in acts of kindness and when you did not.

4. **Vary the acts of kindness** that you perform so that you are not always doing the same thing.

5. Do not perform any acts that may place yourself or others in danger.

Over the next four weeks, keep a "kindness journal" in which you write down the details of performing your kind acts at the end of the day in which you did them. You may want to describe exactly what you did, how the recipient responded (if applicable), and how you felt. Please **use the record sheets provided** to keep track of this information.

Examples of Kind Acts

Do a roommate's dishes.
Help a classmate with their homework.
Hold the door for a stranger.
Feed a stranger's parking meter.
Visit an elderly relative.
Donate blood.
Write a thank-you letter.
Give change to a homeless person.
Collect goods for a food bank.
Donate money to a charity.
Bring coworkers or classmates a special treat.
Pay a compliment to someone.
Offer to pick someone up from the airport/bus station.
Mow a neighbor's grass (or your grass without being asked to do so).
Donate used clothing to the Salvation Army.
Volunteer at an agency that needs help.
Give a hug to a friend.
Give another driver your parking spot.
Leave a treat or handmade note of thanks for a delivery person or mail carrier.
As you go about your day, pick up trash.
Thank the bus driver.
Leave an extra big tip for the waitperson.
Write a note to the boss of someone who has helped you praising the employee.
Call a family member that you haven't talked to in a while.
Give toys for the children at a shelter or safe house.
Renew an old friendship by sending a letter or small gift to someone you haven't talked with in a long time.
Offer to return a shopping cart to the store for someone loading a car.
Invite someone new over for dinner.
Let the person behind you in the grocery store go ahead of you in line.
When drivers try to merge into your lane, let them in with a wave and a smile.
Give a bag of groceries to a homeless person.
Plant a tree in your neighborhood.
Use a camera to take people's photographs at a party or community event and give the picture to them.
Send a gift anonymously to a friend.
Buy books for a day care or school.
Pay for dinner or a movie for a person who you know is having financial difficulty.
Take an acquaintance to dinner.
Offer to take a friend's dog for a walk.
Offer to buy groceries for an elderly relative.
Lend a friend your new video game.
Volunteer to tutor a fellow student.

Decreasing Social Avoidance

When we feel anxious and anticipate that a social interaction may not go well, we may avoid the social situation outright. While avoiding social situations may seem like a good idea and can decrease our anxiety in the short term, it can also cause problems. In particular, avoiding social situations can maintain anxiety and can even make things worse over time. People can decrease their anxiety over the long run and become more comfortable interacting with others by going into social situations that they would usually avoid and staying in these situations until their anxiety goes down. The trick is to stop avoiding social situations. Taking a few slow, deep breaths before entering a social situation may also help by counteracting the physical anxiety response. This may make it easier to stop avoiding social situations.

Take a moment and think about your own life. Are there social situations that you avoid? Are there situations where you could interact more with others but usually stop yourself? For this exercise, we'd like you to decrease your social avoidance by intentionally engaging in several social interactions each week, starting with easier social interactions and gradually working up to harder social interactions. First, take a look at the list of social situations that has been provided on the next page and identify 9-15 social situations that you avoid or where you may be able to seek out social interactions. The social situations that you have chosen can be listed on the third page. Number these situations from the easiest to the hardest (with smaller numbers = easier situations). Then:

1. Pick **two days** during the week to decrease social avoidance.

2. On *each* of these days, intentionally engage in **three social interactions** for a total of 6 social interactions per week.

3. These interactions do not necessarily have to be lengthy or involve extensive conversation. The point of this exercise is to decrease social avoidance - it is not necessary for all of these social interactions to be intense or highly involved.

4. Start with easier social interactions and **gradually work up to harder ones**. You can engage in several interactions of one type until your anxiety goes down a bit before moving on.

5. Before you go into each social situation, **take a few slow, deep breaths** (i.e., inhaling through the nose for a count of four and then exhaling through the mouth for a count of four).

6. **Vary the situations where you have interactions** as much as possible so that you are not always interacting with the same people. This will help you to decrease social avoidance and anxiety in multiple settings.

7. Do not engage in any social interactions that may place yourself or others in danger.

Over the next four weeks, keep a "social interaction journal" in which you write down the details of engaging in your social interactions at the end of the day in which you did them. You may want to describe exactly what you did and how you felt. Please **use the record sheets provided** to keep track of this information.

Examples of Social Situations

Chatting with the person in front of/behind you while waiting in line at the coffee shop.

Talking to the barista while waiting for your drink at the coffee shop.

Talking to other passengers while waiting for the bus.

Introducing yourself to your classmates while waiting for class to start.

Chatting with the person next to you while packing up your books at the end of class.

Talking to your group members while working on group projects.

Asking for help finding books at the library.

Striking up a conversation with the person working next to you in the library.

Chatting with the server before placing an order at a restaurant.

Calling a friend to talk.

Asking a question.

Asking for the time.

Saying hi to your neighbors while checking your mail.

Talking to your neighbors while doing your laundry.

Chatting with other passengers while standing in the elevator.

Saying hi to others while hiking on a busy trail.

Smiling and saying hi while walking on the seawall.

Asking someone if they can break a $5 bill.

Going to a party.

Going to a book club.

Joining a club.

Attending a fitness class.

Chatting with other students while waiting for a photocopier.

Talking to the receptionist.

Talking to the bus driver.

Meeting up with a friend for coffee.

Striking up a conversation with other shoppers at the grocery store or mall.

Going out to dinner with a friend.

Going to the movies.

Striking up a conversation with the person next to you in the cafeteria.

Talking to the person next to you on the bus.

Walking home with someone.

Asking for directions.

Asking for help finding something.

Asking to borrow class notes.

Talking to people at the gym.

Talking to people while swimming.

Striking up a conversation during intermission at a play.

Saying hi to people at the beach.

Saying hi to people at the park.

Recording Life Details

If you think about a typical day, there's often a lot going on. Sometimes there's so much going on that we can't keep track of the details of our day – it seems like things are just flying by. When we experience negative emotions like anxiety, this can get even worse. One thing that sometimes helps is for people to pay more attention to the daily details of their life. "Pay more attention to your life" means that you take notice of the ordinary details of your life that you wouldn't typically think about. These might include particular classes or meetings that you attend, typical interactions with acquaintances, typical thoughts that you have during the day, or your typical schedule as you move through the day.

We'd like you to pay attention to your life details and record your life details over the next four weeks. Specifically:

1. Choose **two days** each week to record your life details.

2. Record at least **three life details** (e.g., events, thoughts, interactions, or schedule details) that happened *each day*.

3. Pay attention to a **variety** of life details to make sure you don't miss anything important.

4. Practice recording your life details by reading the sample records provided on the next page and writing down the details of your day yesterday. Try to think about all parts of the day, not just one time of day.

Over the next four weeks, keep a "life details journal" in which you write down the details of your day at the end of each day that you have chosen. You can describe what you did, who you saw, how the day went, or any notable thoughts that you had during the day. Also, make a note of how you felt at the beginning, middle, and end of each of your chosen days. Please **use the record sheets provided** to keep track of this information.

Example of Three Life Details Diaries

Example Record 1:

Saturday November 10, 2007

Slept in and was late for work.

Missed the bus home and was caught outside during a rain storm without my umbrella.

Met with Mike and Susan for a movie.

Party at Jerry's house.

Walked home with Susan.

Tuesday November 13, 2007

Arrived late for my chemistry exam.

Lunch with Cheryl.

Long chat with my brother.

Played guitar hero.

Finished biology homework.

Example Record 2:

Saturday November 10, 2007

Talked to my mom for a bit before leaving the house.

Saw Nick on the bus. Talked about class.

Checked email. No messages from Ally.

Phone call from Lindsay. Asking about party on Friday. Think I'll go after work.

Watched new show on TV.

Worrying about Carrie. Hope she made it to Utah ok.

Tuesday November 13, 2007

Met up with Ryan for lunch.

Stuck in traffic for twenty minutes.

Surprise phone call from Kelly.

Example Record 3:

Saturday November 10, 2007

Went out for dinner.

Thinking about changing my major.

Talked to Lindsey on the phone.

Tuesday November 13, 2007

Booked my tickets to Mexico.

Finally finished my term paper.

Meeting with my professor.

Played ping pong with my cousin.