

Personality and Health: Reviewing Recent Research and Setting a Directive for the Future

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For decades, researchers have noted the importance of understanding how individual differences influence health and well-being (Adler & Matthews, 1994; Eysenck, 1985; Ferguson, 2013; Smith, 2006). Toward this end, studies have consistently supported the role of personality variables, such as traits, motives, and goals, as informative for predicting current and future health outcomes. While initial work along this front focused solely on the “direct effects” of personality dispositions on health, more recent work has focused on understanding the pathways by which this influence occurs, as well as the extent to which personality effects get “under the skin” and predict physiological markers (Hampson, 2012). Given the changing contexts and behaviors that influence health, as well as the developmental specificity of certain disorders and illnesses, research on personality and health cannot operate without acknowledgment of the aging process. In other words, researchers must actively consider the effects of personality on health through the lens of lifespan developmental theories.

To support and encourage research along this front, this chapter strives toward tackling some less typical topics related to personality and health. This shift in focus corresponds to the need to start taking some things “for granted,” if research is to continue to advance. For instance, gone are the days when one needs to justify claims like “personality predicts health” (see Ferguson, 2013; Hampson, 2012; Smith, 2006, for reviews), or that “personality can change across the lifespan” (see Caspi & Roberts, 2001; Roberts, Walton, & Viechtbauer, 2006; Roberts, Wood, & Caspi, 2008, for reviews). Instead, we focus our review on three questions that have shaped the zeitgeist of personality and health research. First, does personality predict physiological markers of health? Second, does the role of personality on health operate through different pathways across the life course? And similarly, could personality impact health by promoting success

and achievement of developmentally specific benchmarks? Third, how might changes in health and well-being shape one’s personality development? While relatively less research has addressed this final question, it should prove a particularly important topic of inquiry for aging researchers in the years ahead, given the naturally deteriorative progression of health throughout the lifespan.

PERSONALITY TRAITS: DEFINITIONS AND CLASSIFICATIONS

Like the field itself, our chapter will focus on the role of traits in explaining how personality can predict health outcomes. Over recent decades, research has accrued to describe the role of other person-based variables, such as goals (Elliot & Sheldon, 1998; Emmons, 1992; King, 2001), life narratives (Pals, 2006; Pennebaker & Seagal, 1999), and emotions (Pressman & Cohen, 2005; Salovey, Rothman, Detweiler, & Steward, 2000) on physical health and well-being. However, much less work has focused on these non-trait components with respect to the three objectives for the current chapter, a point we touch upon in the discussion section.

Prior to beginning our review, some definitional issues merit discussion. To start, we define personality traits as “relatively enduring, automatic patterns of thoughts, feelings, and behaviors that reflect the tendency to respond in certain ways under certain circumstances” (Roberts, 2009, p. 140). With respect to health psychology, two aspects of this definition are particularly valuable to consider. First, by noting the role of cognitions in traits, it provides a valuable linkage to the social-cognitive work on health intervention programs. Indeed, variables like self-efficacy and perceived control can and should be viewed as aspects of or at least concomitants of dispositional traits (see Roberts et al., 2014, for more detail).

Second, this definition of traits provides insight into the strength of the relationships one should expect when it comes to health outcomes. Traits are not to be viewed as perfect predictors of how one will act in any given situation. Even highly conscientious individuals occasionally partake in too much frivolity and drink or eat to excess. Indeed, if one merely looks at the correlations for performing the same behavior across two instances, studies often report magnitudes similar to what [Cohen \(1988\)](#) would deem only a medium effect size ([Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004](#); [Funder & Colvin, 1991](#)). As such, it is highly unlikely that traits will ever prove “strong” predictors of health outcomes, particularly when paired with the knowledge that a wealth of other variables also influence physical health (e.g., socioeconomic status, intelligence, bad luck).

Accordingly, while most of the effects reviewed here are small to medium in magnitude, it is perhaps more impressive that they are consistently demonstrated at all. Moreover, meta-analytic work suggests that personality traits often provide as strong of effects on outcomes like mortality as do “traditional” predictors like socioeconomic status and IQ ([Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007](#)). The impressive power of personality may be no clearer though than when predicting physiological markers of health, including outcomes determined by multiple factors, such as cardiovascular disease, obesity, and physical fitness known to be highly influenced by genetics and early environment.

DISPOSITIONS AND HEALTH: A BRIEF HISTORY OF MODELS IN THE FIELD

One of the most well-referenced models connecting personality and health comes from a review by [Adler and Matthews \(1994\)](#) that was updated recently in [Bogg and Roberts \(2013\)](#).

This work presents three general pathways by which personality traits predict who gets ill. First, dispositions predict who participates in health behaviors ([Bogg & Roberts, 2004](#); [Smith, 2006](#)), which in turn influence physiological mechanisms and ultimately health. Second, personality traits can predict these mechanisms directly. Third, personality traits may correspond with or influence social environmental characteristics, which then influence both of the constructs above. Evidence for the first claim is now well-known (see [Bogg & Roberts, 2004](#); [Hampson, 2012](#)), and some work has long linked personality traits to social environmental factors, such as occupational success ([Roberts, Caspi, & Moffitt, 2003](#)), marital stability ([Roberts et al., 2007](#)), relationship quality ([Hill, Nickel, & Roberts, 2014](#)), and broader institutions such as community and religious affiliations ([Lodi-Smith & Roberts, 2007](#)). As the second pathway (through physiology) has become of increasing interest in the past decade, we review this literature in greater detail as our first focus below.

While relatively simple in its presentation, this framework has proven a valuable foundation for more contemporary models in the field given the broad empirical support described above ([Bogg & Roberts, 2013](#); [Ferguson, 2013](#); [Friedman, Kern, Hampson, & Duckworth, 2014](#)). Comparing these models to the original [Adler and Matthews \(1994\)](#) work demonstrates just how far the field progressed within that two-decade span. Now there is a greater recognition that personality traits can influence the ways by which individuals seek assistance for their health, think about and cope with potential issues, and even become aware of these concerns. However, relatively few models have considered whether and how these different links might change over the life course. In addition, only recently have papers acknowledged the potential for health itself to influence whether adults can change their dispositional tendencies ([Kern & Friedman, 2011](#); [Sutin, Zonderman, Ferrucci, & Terracciano, 2013](#)).

Accordingly, our review advances the claim that even the most multidimensional models of personality and health today often fail to capture just how impressively complex the relationship between these two variables may in fact be. Therefore, we present the evidence for these additional links, as well as the recent work connecting personality and physiological mechanisms, and then conclude by noting how best to account for this work in the extant models.

PERSONALITY TRAITS AND PHYSIOLOGICAL MARKERS OF AGING

When considering the role of personality on physiology, we focus below on markers of clear interest to the process of healthy aging. Specifically, we organize our review into effects on inflammatory markers and cardiovascular variables. Most of the research along these fronts has focused on the role of the higher-order Big Five personality traits (Digman, 1990; John, Naumann, & Soto, 2008): extraversion, agreeableness, conscientiousness, neuroticism (or conversely, emotional stability), and openness to experience. As noted elsewhere, conscientiousness and neuroticism tend to be the strongest predictors of health behaviors (Hampson, 2012), results that appear to carry over to the physiological domain.

Inflammatory Markers and Personality Traits

Quite recently, a number of studies have pointed to the potential for the Big Five traits to predict markers of inflammation. For instance, multiple studies now point to consistent relationships between traits and interleukin-6 (IL-6) levels (Sutin, Terracciano, et al., 2010; Turiano, Mroczek, Moynihan, & Chapman, 2013). Increased levels of IL-6 lead to greater inflammation in reaction to an injury, which while

beneficial in acute cases, becomes problematic when its production is more chronic in nature. This marker is of particular interest for aging researchers, given its propensity to increase with age (Maggio, Guralnik, Longo, & Ferrucci, 2006).

Across multiple samples, research suggests that conscientious and emotionally stable (less neurotic) individuals tend to exhibit lower levels of IL-6, even when controlling for an array of health behaviors and other control variables (Chapman et al., 2011; Sutin, Terracciano, et al., 2010; Turiano et al., 2013). These significant relations have been exhibited across multiple facets, or lower-order traits, for each broader domain trait (Sutin, Terracciano, et al., 2010). Moreover, research suggests that it may be valuable to examine the interaction between these two traits (Turiano et al., 2013). Interestingly, while neuroticism in general positively predicts IL-6 levels, those findings suggest that being moderately neurotic may be adaptive in the context of high conscientiousness. These findings point to the potential for a “healthy neurotic” (Friedman, 2000), or the possibility that having some anxiety may be a good thing when it comes to health, otherwise one might miss health concerns or symptoms when they become present.

Another outcome that has been targeted in personality research is C-reactive protein (CRP), another variable for which elevations can be valuable in cases of acute injuries, though chronically elevated levels have been associated with a greater risk of cardiovascular disease (Lagrand et al., 1999). Although fewer studies have examined CRP, the results again often suggest a beneficial role for conscientiousness (Möttus, Luciano, Starr, Pollard, & Deary, 2013; Sutin, Terracciano, et al., 2010), although this is not always the case (Armon, Melamed, Shirom, Berliner, & Shapira, 2013). Additionally, studies have suggested a positive role for openness to experience (Armon et al., 2013; Möttus et al., 2013), but maladaptive effects for neuroticism (Armon et al., 2013; Sutin, Terracciano, et al., 2010).

Cardiovascular Indicators and Personality Traits

Another important domain of interest is how personality traits predict cardiovascular markers. Such research builds from some of the “classic” work on personality and health, wherein hostility and aggression were linked to greater risk of cardiovascular disease (see [Booth-Kewley & Friedman, 1987](#), for a review). More recent efforts also have shown that conscientiousness and neuroticism predict a wide variety of cardiovascular health outcomes, positively and negatively, respectively ([Hagger-Johnson et al., 2012](#); [Schwebel & Suls, 1999](#); [Shipley, Weiss, Der, Taylor, & Deary, 2007](#)). For instance, neuroticism predicts mortality risk from cardiovascular disease ([Terracciano, Löckenhoff, Zonderman, Ferrucci, & Costa, 2008](#)). However, efforts to find consistent linkages at the physiological level have proven difficult, perhaps in part due to the inherent variability with cardiovascular markers. For example, one study demonstrated relationships between personality traits with blood pressure readings for both extraversion and agreeableness, but underscored the modest nature of these effects ([Miller, Cohen, Rabin, Skoner, & Doyle, 1999](#)).

That said, it is interesting to note that relationships between cardiovascular health and personality traits appear to hold even when considering potential counter-explanations. For instance, at least one study has found little evidence that common genes may underlie both personality traits and cardiovascular risks ([Pilia et al., 2006](#)). Furthermore, the study above on blood pressure found that even those modest associations with personality traits held when controlling for various health practices ([Miller et al., 1999](#)). In other words, personality traits appear associated with cardiovascular health, even when accounting for how both are influenced by our genes and experiences.

Instead of focusing on one cardiovascular outcome or another, a more promising approach

may be to consider constellations of biomarkers and health indicators. One recent direction has been to focus on how personality might predict diagnoses of “metabolic syndrome,” which reflects whether one presents with multiple risk factors, including poor blood pressure, cholesterol issues, and higher waist circumference. Diagnoses along this front are in turn predictive of major health issues such as obesity, diabetes, and even death by cardiovascular causes ([Grundy, 2008](#); [Grundy et al., 2005](#)). Therefore, it is of interest to note that research is beginning to suggest that conscientious, agreeable, and emotionally stable individuals might experience a reduced risk for metabolic syndrome ([Sutin, Costa, et al., 2010](#)). Similarly, aspects of neuroticism like depression and distress appear predictive of greater risk ([Heiskanen et al., 2006](#); [Mommersteeg, Kupper, & Denollet, 2010](#)).

Two recent studies from the Dunedin Multidisciplinary Health and Development Study examined more comprehensive sets of physiological health markers that used inflammatory, cardiovascular, and metabolic indices ([Israel et al., 2014](#); [Moffitt et al., 2011](#)). In the first study, composite measures of childhood low self-control were used to predict health-related physiological markers at age 32 both in composite and individually ([Moffitt et al., 2011](#)). Children who were lower in self-control at age 10 showed early signs of poor health at age 32 even when controlling for cognitive ability and socioeconomic background. In particular, low self-control predicted elevated levels of CRP, higher incidence of metabolic abnormalities, and even elevated levels of periodontal disease. In the second study, observer ratings of personality traits at age 26 were used to predict physiological markers of poor health at age 38 ([Israel et al., 2014](#)). Once again, conscientiousness was related to fewer health-related problems as indexed with a composite of physiological abnormalities such as high blood pressure, inflammatory markers, low HDL cholesterol, elevated CRP, and poor pulmonary functioning.

Although past research has linked higher levels of conscientiousness to lower levels of self-reported diseases (Goodwin & Friedman, 2006), links to objectively defined diseases or disease markers are less common. Some research has tied low conscientiousness to poor glycemic control in type I diabetes patients (Lane et al., 2000). While other research has shown that high conscientiousness is a protective factor for renal failure in dialysis patients (Brickman, Yount, Blaney, Rothberg, & De-Nour, 1996). Yet strong links to well-known diseases such as diagnosed cardiovascular disease or certain forms of cancer are rare.

In contrast, one disease of aging, Alzheimer's disease, has been consistently linked to conscientiousness (Terracciano et al., 2014). From simple cross-sectional studies differentiating people with Alzheimer's versus those without (Duchek, Balota, Storandt, & Larsen, 2007), to longitudinal prospective studies (Wilson, Schneider, Arnold, Bienias, & Bennett, 2007), conscientiousness has been shown to be a protective factor for Alzheimer's disease. Moreover, a recent meta-analysis of the longitudinal prospective studies showed that conscientiousness was not only protective at the aggregate level, but also in each and every one of the studies that were analyzed (Terracciano et al., 2014). Quite possibly the most interesting aspect of this line of research is the finding in post-mortem studies that the level of neuropathology does not mediate the relation between conscientiousness and Alzheimer's disease (Terracciano et al., 2013; Wilson et al., 2007). In other words, conscientiousness appears to have an influence on Alzheimer's development that is unaccounted for at the level of known pathology. Moreover, many of the factors that one would presume to account for the role of conscientiousness in Alzheimer's such as cardiovascular disease, smoking, and poor health failed to account for the effect of conscientiousness (Wilson et al., 2007). Thus, conscientiousness appears to

protect against the onset of Alzheimer's disease but the reasons why remain elusive.

In sum, research has begun consistently demonstrating linkages between conscientiousness and biomarkers of aging and health. Nonetheless, much work remains to be done. Future research must continue to reconsider what these relations mean, why they occur, and what are the best methods for combining biomarkers into meaningful constellations, which may prove most useful for health care application.

PERSONALITY AND HEALTH ACROSS ADULTHOOD: MODERATORS, MODERATED MEDIATORS, AND MORE

The literature above presents the case for why personality traits are related to biomarkers of the aging process. However, another important question is whether personality predicts health differently across the adult years, as well as if these relationships are explained by the same mechanisms. In other words, are the links between traits and health *moderated* by age, and is there any evidence for *moderated mediation*, or that the variables linking personality to health may do so to a stronger or weaker extent throughout adulthood?

Age as a Moderator of Personality Traits and Health

The impressive strength of personality as a predictor of health comes in part from the fact that these relationships often are quite stable throughout the life course. For instance, research suggests that conscientiousness positively predicts self-rated health across adulthood (Hill & Roberts, 2011). Similarly, moral personality traits, like dispositional forgiveness and gratitude, appear to predict emotional and subjective health relatively equally throughout adulthood (Hill & Allemand, 2011; Hill,

Allemand, & Roberts, 2013). However, this research has been relatively limited, even when discussing more subjective health outcomes like happiness and affect (see Hill, Mroczek, & Young, 2014, for a review). As such, more research is needed to examine the potential moderating role of age.

Age as a Moderator of the Linkages Between Personality Traits and Health

One potential reason for this paucity of work might be that it often proves difficult to make clear theory-driven predictions for why such linkages might occur. Presumably simpler is the possibility of describing why personality traits would differentially predict health behaviors across the lifespan, or that certain behaviors may be more important for health at different periods of adulthood, either of which would lead to these indirect effects being conditional by age. The intuitiveness of these predictions results from the well-known fact that individuals face greatly different risks for illness and mortality across adulthood. As such, one would anticipate that specific behaviors would prove more or less beneficial in the face of the changing needs for health. As such, the indirect pathways between personality traits and health should differ across adulthood, mostly as a result of the links between specific health behaviors and health changing in magnitude (the “second” half of the pathway).

With respect to the “first” half, research has shown that age moderation effects differ depending on the specific behavior evaluated. For instance, a meta-analysis of conscientiousness and health behavior (Bogg & Roberts, 2004) found that the trait was a stronger predictor of activity level, alcohol use, drug use, unhealthy eating, risky driving, and tobacco use for younger than older adults. One rationale for these findings is that these behaviors might be of greater relevance for younger adults, or at least have greater variability

during this period, in turn allowing a greater opportunity for moderation effects. However, similar arguments could be made for risky sexual activity, suicidal behavior, and violence, outcomes that failed to show any age moderation in that sample. In addition, research also has demonstrated little evidence for age as a moderator of the links between conscientiousness and medical adherence (Hill & Roberts, 2011). Similarly, work on gratitude shows little age moderation when predicting medical care behaviors (Hill et al., 2013). It may be that the effect is especially small and only detectable with the sample sizes that are afforded in meta-analytic work.

In other words, age may prove to be a more specific rather than universal moderator of the links between personality and either health or health behavior. Accordingly, it is worth noting a few other potential moderators. For instance, research has suggested that socioeconomic status might play a role, insofar that traits may prove differentially protective or deleterious based on economic strata (Chapman, Fiscella, Kawachi, & Duberstein, 2010). In addition, one of the more promising avenues in recent health psychology research considers the potential for traits to serve as the moderators. Along this front, one of the more consistently published effects is that conscientiousness may prove to moderate the known negative relationship between neuroticism and health, a dynamic that leads to the “healthy neurotic” phenomenon (Friedman, 2000; Turiano et al., 2013). Specifically, the detriments associated with neuroticism might be buffered by being relatively conscientiousness at the same time. Interestingly, some evidence even suggests that it may be better to be both conscientious and (somewhat) neurotic than to be conscientious and emotionally stable (Turiano et al., 2013). In this respect, one can see the healthy neurotic concept at play; some anxiety might prove adaptive in order to encourage one to maintain vigilance with respect to health promotion, a

process that comes more easily for conscientious individuals. These trait-by-trait interactions will prove an exciting avenue for future personality and aging research, particularly given the known associations between adult role engagements and development on conscientiousness and neuroticism (Bleidorn et al., 2013; Lodi-Smith & Roberts, 2007).

The Full Role of Age on the Linkages Between Personality and Health

Based on the evidence above, one might conclude that age plays only a limited role in describing the pathways between personality traits and health, although this evidence is notably limited in some key places. However, this work should not be taken as evidence that these pathways are wholly consistent across the adult years. Indeed, multiple studies have pointed to the fact that these indirect effects are conditional on age, primarily due to the differing relationships between health behaviors and health (Hill & Roberts, 2011; Hill et al., 2013). For instance, conscientious individuals adhere better to their medication regimens, a mediator that appears more relevant for understanding the health benefits of the trait later in the lifespan (Hill & Roberts, 2011). Certainly it proves rather intuitive that following your medications is more important as you get older. While these explanations for moderated mediation might be less exciting or novel compared to the potential roles for age discussed above, they can provide valuable insights into holes in the literature and directions for future research. For instance, if conscientiousness appears similarly predictive of health across adulthood, but certain mediators (e.g., medication adherence) are stronger predictors for older adults, what are the variables that better explain the health benefits of conscientiousness for younger adults? Questions like these will help build upon current models of personality and health to examine the roles of different potential mediators not

only relative to each other, but also relative to the developmental period of interest.

HEALTHY LIVING AS A CATALYST FOR PERSONALITY DEVELOPMENT

To this point, our discussion and more broadly the field has focused on how personality traits lead to health outcomes. This directionality is expected for two primary reasons. First, personality traits were classically assumed to exhibit little to no change during the adult years (Costa & McCrae, 1992), and in fact, research does point to the fact that personality stability tends to increase with age (Roberts & DelVecchio, 2000). Second, to justify the merit of studying personality traits, early research often focused on showing their value for predicting “hard” medical outcomes, like mortality. As such, it is unsurprising that relatively little research has examined the potential for health (or changes in health) to have lasting effects on personality development in adulthood.

We present the case here for additional research on this front based on three relatively recent findings. First, markers of subjective wellbeing appear to predict changes in adult personality traits (Hill, Turiano, Mroczek, & Roberts, 2012; Specht, Egloff, & Schmulke, 2013). Second, living a healthy lifestyle might engender a more adaptive personality profile (Stephan, Sutin, & Terracciano, 2014; Takahashi, Edmonds, Jackson, & Roberts, 2013). Third, experiencing a major illness might enact lasting personality change. Each of these points is taken up below, as support of calls for increasing work on the “other side” of the personality and health relationships (Kern & Friedman, 2011). When possible, across each section we will discuss two potential findings of relevance: (i) evidence that initial status in health or health behavior predicts personality trait change, or “predictive effects,” (ii) results that suggest changes in these health variables coincide

with those on personality traits, or “correlated change effects.”

Subjective Wellbeing and Adult Personality Change

Health clearly reflects a number of dimensions outside of simply risk for physical ailments, including one’s social and psychological wellbeing (World Health Organization, 1948). As such, it is worth noting that individuals higher on these other dimensions of health appear to experience more “adaptive” changes on personality profiles. For instance, one study examined how life satisfaction predicted changes in personality maturation among German adults (Specht et al., 2013). This work demonstrated that individuals initially more satisfied with their lives were prone to become more emotionally stable, agreeable, and conscientious over the span of the next 4 years. Similarly, research has demonstrated correlated changes between personality traits and social wellbeing, insofar that increases in social wellbeing tend to coincide with adaptive trait changes (Hill et al., 2012).

A few interpretations of these findings are possible, which lead to directions for future research on positive aging and personality development. First, if life satisfaction and social wellbeing serve as proxies for health and adaptive aging, these findings present evidence that healthier individuals experience more positive personality change. Second, if these indicators of subjective wellbeing serve as proxies for adaptive role attainment (e.g., marriage, community engagement, employment, etc.), then the findings discussed above provide support for the claim that success in adulthood might promote positive personality change, as has been suggested before (Roberts et al., 2008). Third, the studies above may present evidence when people act in ways that promote health and wellbeing, they reap the rewards thereof, which serves as a form of feedback for which

personal dispositions and characteristics upon which they should focus. Disentangling these three closely linked hypotheses should serve as a catalyst for future research, and relatively recent work has begun to test this third possibility.

Healthy Behaviors as Predictors of Personality Change

While this work is in its infancy, research has begun to test whether enacting a healthier lifestyle could promote positive personality change, and the findings are modestly positive thus far. For instance, one study found that individuals who reported an increased tendency to engage in preventative health behaviors (wellness maintenance, accident control, physical activity, etc.) over a 3-year span also tended to increase on conscientiousness during that period (Takahashi et al., 2013). In addition, research with middle-aged and older adults has demonstrated that more physically active individuals were less likely to experience maladaptive changes in personality over time (Stephan et al., 2014), although the effects were fairly modest in magnitude. Taken together, these correlated change and longitudinal findings point to the potential for healthy engagement to beget positive (or less negative) personality changes among adults. Moreover, it is important to note that both studies found effects for conscientiousness, and the second also demonstrated some findings with respect to agreeableness, suggesting that the effects are not specific to those traits for which assessments often explicitly ask about activity, agency, and engagement (e.g., extraversion and openness).

Major Illness as a Predictor of Personality Change

To this point, we have focused on the role of positive health outcomes and behaviors on personality change and development. However,

equally, if not more, intriguing is the potential for negative health outcomes and major health-related struggles to influence personality change. This intrigue comes from the fact that one could easily expect significant findings to occur in either direction. Individuals who experience a life-changing medical event (e.g., stroke, heart attack, etc.) may fall into a depressogenic mindset and be more likely to perceive that their health outcomes are beyond their control; in turn, these individuals could focus less on living a self-controlled, emotionally stable lifestyle and thus experience personality corruption as a result. Alternatively, experiencing such an event might shake individuals from their initially negative lifestyles, and redirect them toward a more conscientious and less neurotic path. The second possibility may prove particularly likely given that individuals who experience negative health events are likely to be lower on adaptive personality traits in the first place (Goodwin & Friedman, 2006; Hampson, 2012).

Though limited, research has demonstrated a complex set of results that support both possibilities. For instance, one study of Finns found that emerging adults diagnosed with a chronic disease were more likely to remain introverted and neurotic than their peers (Leikas & Salmela-Aro, 2015). However, this life event also was associated with the potential for becoming more conscientious with time. Among older adults, work suggests that reporting a greater disease burden predicts becoming more conservative and less open to new experiences (Sutin et al., 2013), a change that could help individuals avoid future disease exposure, but also potentially increase mortality risk (Turiano, Spiro, & Mroczek, 2012). In addition to these longitudinal findings, more retrospective work has suggested that observers (e.g., caregivers, family, friends) often report changes in personality among patients experiencing Alzheimer's disease or stroke (Stone et al., 2004), typically in the negative direction. In sum, research points to the potential for

individuals to change their personalities following a major health concern in both adaptive and maladaptive ways, often depending on the illness in question. Research thus should potentially compare self-reports and observer-reports for the traits in question, as observers could pick up on changes less discernible to the patient, which serves as one direction for future work.

CURRENT AND FUTURE DIRECTIONS

No longer is it the case that aging or health researchers need to be convinced of the value inherent in studying personality traits. Research consistently demonstrates that certain dispositions and personal characteristics lead individuals to live healthy or less healthy lives (Hampson, 2012; Smith, 2006), and in turn age more adaptively throughout the lifespan. Given this background, we focused on three central directions for ongoing research in the field. First, we discussed the potential for personality to predict physiological markers of aging and physical health. Second, we elaborated on the potential for personality traits to influence health through different mechanisms and pathways across the lifespan. Third, recent research suggests the potential for a bidirectional relation between health and personality, underscoring the role that our wellbeing can play in shaping our personality development.

In considering these points, and how they should direct future work, it appears valuable to return to and amend the prototypical models explaining the links between personality traits and health (Adler & Matthews, 1994; Bogg & Roberts, 2013). Certainly research has supported all of their initial predictions, insofar that personality traits can predict changes in the social environment (Asendorpf & Wilpers, 1998; Donnellan, Larsen-Rife, & Conger, 2005), health behaviors (Bogg & Roberts, 2004; Takahashi

et al., 2013), and biophysiological mechanisms (Sutin, Costa, et al., 2010; Turiano et al., 2013), which all in turn influence physical health and wellbeing. Given the work described above, we note three additional considerations when applying this model to understanding personality and aging. First, researchers must consider the potential for age to moderate all links in the framework. For instance, during different points in adulthood, the causal direction between personality and the social environment may change (Hill, Payne, Jackson, Stine-Morrow, & Roberts, 2014). Moreover, certain biomarkers of health play a stronger role on health and physical limitations later in the life course than earlier. As such, researchers are encouraged to always consider the theoretical framework within the context of a lifespan developmental perspective, insofar that certain variables will provide a differential explanation for the role of personality on health across the lifespan.

Second, while necessarily complicating the model and its predictions, further work is needed on potential bidirectional relationships. Research must strive toward understanding health as a potential feedback loop throughout the model. Experiencing greater wellbeing, or more positive aging compared to peers should alert individuals to the potential value both of continuing with a more adaptive behavioral regimen, but also ultimately of the underlying dispositional characteristics involved. As such, one can consider the possibility for healthy individuals to develop more positive personality profiles, in part as a result of enacting more behaviors associated with those adaptive traits. For instance, wellness or illness could lead one to restructure daily activities and reorganize goals, which in turn leads them to increasing on conscientiousness.

Third, both of these additions, as well as the literature described above, underscore the value of studying the linkages between personality and healthy aging by employing not only

longitudinal predictive models, but also models that consider the role of correlated changes. Initially, the field focused for obvious reasons on the potential for personality or health behaviors to precede long-term changes in health and wellbeing. As such, we were left with models that only moved from left to right. Instead, it has become evident that researchers must strive toward understanding that these relationships are inherently dynamic in nature, and thus capitalize upon the methodological and analytic techniques that account for this fluidity. For instance, it no longer proves valuable simply to measure personality at a single time point, if under the assumption that assessment will serve as a proxy for personality across the span of the study. While there is clear evidence in support of the general stability of personality traits during adulthood (Roberts & DelVecchio, 2000), aging research would inherently benefit from avoiding the assumption that one measurement fits all.

While these alternations would be valuable, it also will prove important to consider Adler and Matthews' (1994) definition of "individual dispositions" more thoroughly. Note that even their initial article avoided reducing this term down to simply personality traits, and instead considered other characteristics such as moods and explanatory styles. Similarly, researchers must continue to move beyond traits, and into studying the person more inclusively, looking at all potential aspects of identity and self (Roberts & Wood, 2006). Moreover, there is clearly a large literature on how our attitudes and beliefs shape our health decisions (Lawton, Connor, & Parker, 2007), work that often goes without connection to the personality literature described herein. We thus would encourage researchers not only to assess constructs outside of the domain of traits, but also to more readily incorporate multiple aspects of the person (traits, motives, attitudes) when building models of healthy aging, which could look to recent work (Bogg & Roberts, 2013; Ferguson, 2013;

Friedman et al., 2014) for some guidance. By following the suggestions and guidelines set forth by this review, we believe the field of personality and health can continue to age positively.

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