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CHAPTER

22 Associations Between Personality and Health Behaviors Across the Life Span

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Abstract

Personality traits are robust predictors of health over the life span and behavioral choices connect personality to health. Personality characteristics predict whether individuals will engage in health-promoting or health-detrimental behaviors. The chapter examines personality–behavior associations and reviews the Health Behavior Model of personality and associated literature. It focuses on how the Midlife in the United States (MIDUS) study has advanced research by discussing both cross-sectional and longitudinal associations between personality traits and behavior and interactive effects among personality traits. Findings suggest that higher levels of neuroticism and lower levels of conscientiousness are associated with engagement in detrimental behaviors. These associations tend to persist over time. Also discussed are the methodological advances using MIDUS data to formally test mediation models. Future directions can advance understanding of personality–behavior associations, including examining the bidirectional relationship between behavior and personality and identifying whether such associations differ by age.

Keywords: [personality traits](#), [health](#), [personality](#), [behavioral choices](#), [Health Behavior Model of personality](#), [MIDUS study](#), [neuroticism](#), [conscientiousness](#), [health behaviors](#)

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Introduction

The Midlife Development in the United States (MIDUS) study provides rich opportunities to explore individual difference factors that may matter for midlife development and the aging process. This chapter focuses on associations between personality characteristics and behavior, on the assumption that one key mechanism connecting personality to health is through one's behavioral choices. Individuals with certain personality characteristics engage in either more health-promoting or health-detrimental behaviors, which in turn may influence health over the entire life span. The chapter is divided into three main sections. First, we discuss the prior work outside of MIDUS that set the foundation for current work exploring associations between personality, behavior, and health. This section is organized into subcategories, beginning with cross-sectional and longitudinal analyses to connect various personality characteristics to diverse health-related behaviors, including those involving alcohol, tobacco, and drug use. We then consider how trait-by-trait interactions may provide a more precise understanding of the associations between personality and behavior, followed by a discussion of the importance of the Health Behavior Model (HBM) of personality (Smith, 2006) as a guiding conceptual framework for this area of inquiry. The second major section showcases findings from our program of research utilizing the MIDUS study. Last, the third section concludes with consideration of the limitations of current research and needed future directions that will utilize the third wave of MIDUS data.

Background Literature

p. 306

Operationalizing Individual Differences in Personality Traits

Personality is a broad psychological term dedicated to understanding the relatively enduring patterns in the thoughts, feelings, and actions of individuals that differentiate yet make persons alike (Goldberg, 1990). It includes many kinds of individual difference variables, including goals, motives, preferences, interests, self-conceptions, narratives, and traits, among others. We focus on traits in this chapter, in part because traits have well-documented and robust associations with health behaviors and health outcomes. One of the more prominent taxonomies to assess personality at the trait level is the Five-Factor Model or the "Big Five" personality traits represented by neuroticism, conscientiousness, extraversion, agreeableness, and openness (John, Naumann, & Soto, 2008; McCrae & Costa, 1999). *Conscientiousness* refers to the propensity to be goal directed, responsible, disciplined, and in control of impulses. *Neuroticism* contrasts emotional stability and even-temperedness with negative emotionality and increased reactivity to stress. *Agreeableness* refers to the propensity to be prosocial, cooperative, empathetic, generous, and kind versus the tendency to be hostile, aggressive, and rude. *Extraversion* implies an inclination to be outgoing, expressive, sociable, and energetic, whereas *introversion* marks individuals considered to be quiet, inhibited, and content to follow the lead of others. Imagination, creativity, open-mindedness, and intellectuality are all characteristics of a person high in trait openness, while individuals low on openness tend to be conventional and have more narrow interests.

The Big Five are the broad domains of personality traits, but there are multiple aspects or "facets" that underlie each trait. For example, the widely used NEO-PI-R personality inventory quantifies six related yet distinct facets for each of the Big Five personality domains. Moreover, other quantifications of personality exist beyond the Big Five, such as life narratives, motives, values, goals, and other constructs (McAdams, 2001; Rotter, 1966). However, with respect to health, the Big Five traits are the category of personality variables that, to date, have received the most attention with respect to health and longevity outcomes (Hampson & Friedman, 2008).

Personality and Substance Use Behaviors

Identifying individuals at greater risk for poor health outcomes, and understanding why these individuals are at risk, is at the heart of the field of health psychology. Adler and Matthews (1994) provided one of the first reviews highlighting the fact that individual dispositions may be related to disease via health-related behaviors. Much of the early research in this area focused on understanding why the Type A behavior pattern was associated with an increased risk of cardiovascular events (Myrtek, 2001). Moreover, the specific facets of hostility and aggression are positively associated with higher use of alcohol, tobacco, and marijuana (Caspi et al., 1997; Hampson, Andrews, Barckley, & Peterson, 2007; Terracciano, Löckenhoff, Crum, Bienvendu, & Costa., 2008). Importantly, these associations are found regardless of whether these trait characteristics were measured in childhood, adolescence, or adulthood.

In parallel, a vast literature shows that individuals scoring higher in neuroticism (e.g., high anxiousness and emotional reactivity) are more likely to start smoking cigarettes, smoke a greater number of cigarettes, and smoke for a greater number of years compared to those scoring lower in neuroticism (Malouff, Thorsteinsson, & Schutte, 2006; Mroczek, Spiro, & Turiano, 2009; Munafò, Zetteler, & Clark, 2007; Rausch, Nicholson, Lamke, & Matloff, 1990). This body of empirical work suggests that individuals with certain personality characteristics (higher neuroticism or lower agreeableness) resort to health-damaging behaviors (e.g., alcohol, tobacco, and illicit drug use) to alleviate the immediate feelings of stress and anxiety, while ignoring the long-term consequences of such health-damaging behaviors over time.

There is also a convincing literature connecting conscientiousness, measured at many different points in the life span (e.g., Friedman et al., 1995), with a lower likelihood of engaging in health-damaging behaviors. For example, lower levels of conscientiousness predict the use of alcohol, tobacco, and illicit drug use (Kashdan, Vetter, & Collins, 2005; Malouff et al., 2006; Terracciano et al., 2008; Turiano, Whiteman, Hampson, Roberts, & Mroczek, 2012), an association that has been confirmed with meta-analytic findings involving 194 studies (Bogg & Roberts, 2004). Moreover, lower levels of conscientiousness are associated with a host of other behaviors, such as medical treatment nonadherence, unbalanced diet and lack of exercise, and risky sexual behaviors (Bogg & Roberts, 2004; Hill & Roberts, 2011), which are considered some of the leading behavioral contributors to poor health and earlier mortality.

p. 307 The findings for extraversion and openness are somewhat mixed, but there is some indication that scoring higher on these traits is associated with increased use of alcohol, tobacco, and illicit drugs like marijuana (Hampson Goldberg, Vogt, & Dubanoski, 2006; Malouff et al., 2006; Munafò et al., 2007; Terracciano et al., 2008). Though high levels of these traits are associated with increased substance use in some samples, it is also important to note that these traits are also typically associated with more optimal health outcomes, such as longer life (Turiano, Spiro, & Mroczek, 2012) and more optimal social networks (Swickert, Rosentreter, Hittner, & Mushrush, 2002). This mixed pattern of findings underscores the importance of not labeling a trait as “good or bad,” but rather exploring the positive and negative pathways each trait has with both behaviors and health outcomes.

In evaluating the consistency of personality–behavior findings, there are several recent meta-analyses that have confirmed the predictive power of personality (see Chapter 23, this volume, for further details of meta-analytic findings involving the MIDUS cohort). Results from a meta-analysis of over 70,000 participants from eight cohort studies confirmed that higher neuroticism, extraversion, and openness and lower conscientiousness are potential risk factors for increased use of alcohol (Hakulinen, Elovainio, et al., 2015). In a separate meta-analysis of nine different cohort studies, being more extraverted, neurotic, and less conscientious predicted higher odds of being a former or current smoker compared to never being a smoker (Hakulinen, Hintsanen, et al., 2015). Whereas lower agreeableness and higher openness were related with increased odds of being a former smoker compared to a never smoker, there were no significant differences between current and never smokers.

This meta-analysis not only indicated high neuroticism and low conscientiousness as risk factors, but also found that higher levels of extraversion were associated with cigarette use. Specifically, those higher in extraversion and lower in conscientiousness were more likely to initiate smoking over time, and those higher in neuroticism were more likely to start smoking over time even after they had previously quit. Successfully leveraging single-study findings from MIDUS in meta-analyses is beneficial because it highlights the generalizability of associations in MIDUS to more diverse samples.

Personality Change and Substance Use Behavior

Not only *level* of personality important is for understanding healthy aging, but also *change* in personality is important. Although the Big 5 personality traits are relatively stable constructs (Costa & McCrae, 1986), there are normative changes that can be expected over the life span (Roberts & DelVecchio, 2000; Roberts, Walton, & Viechtbauer, 2006). Typically, studies show mean-level increases in conscientiousness, agreeableness, openness, extraversion, and emotional stability through young adulthood into middle adulthood. This is typically followed by stability in conscientiousness, extraversion, agreeableness, and emotional stability with a slight decrease in openness to new experiences in mid- to late adulthood. Most important, rates of personality change, above and beyond initial levels, have been shown to be important predictors of health (e.g., Mroczek & Spiro, 2007).

One landmark study in this area was an investigation of over 1,600 adult men from the Normative Aging Study (Mroczek & Spiro, 2007). Followed over 18 years, the authors found that individuals who scored higher on neuroticism at baseline and continued to increase in neuroticism over time had the strongest hazard of dying over the follow-up period. Since this initial study, several other investigations confirmed the important role trait change has on behavior and health. Several of these key studies utilized MIDUS data and are discussed in further sections of this chapter.

Trait-by-Trait Interactions

Recent evidence supports the hypothesis that multiplicative effects among the Big Five traits predict key behaviors and health outcomes (Hampson, 2008). For instance, an individual who scores higher on two traits (e.g., neuroticism and extraversion) may have exacerbated risk of engaging in detrimental health behaviors, which would be missed by looking solely at that person's level on one of these traits. Alternatively, some individuals may have not only one risk factor (e.g., high neuroticism) but also a protective factor (e.g., high conscientiousness). Such combinations of risk and protective factors may cancel each other out, or perhaps higher conscientiousness might buffer against the deleterious effects of higher neuroticism. These possibilities are important to investigate as they provide more specificity of how aspects of multiple personality traits are jointly associated with substance use behavior. However, only a small literature has focused on exploring such trait-by-trait interactions to date.

p. 308

In this initial set of studies, conscientiousness has emerged as the one trait that seems particularly important in trait-by-trait interactions. For example, adults scoring low in conscientiousness *and* high in neuroticism were about three times more likely to be current smokers than those with high conscientiousness and neuroticism (Terracciano & Costa, 2004). Among a sample of undergraduates, Hong and Paunonen (2009) found that those with low conscientiousness and low agreeableness were most likely to smoke compared to other trait constellations. Vollrath and Torgersen (2008) found that the particular combination of high neuroticism and low conscientiousness was most associated with smoking. This combination of traits was also related to higher self-report of drunkenness, elevated rates of drunk driving, and higher levels of marijuana use when compared to other personality combinations. There are also trait-by-trait interactions in relation to other behaviors, such as counterproductive work behaviors (Bowling, Burns, Stewart, & Gruys, 2011) and medication adherence (Axelsson, Brink, Lundgren, & Lötval, 2011).

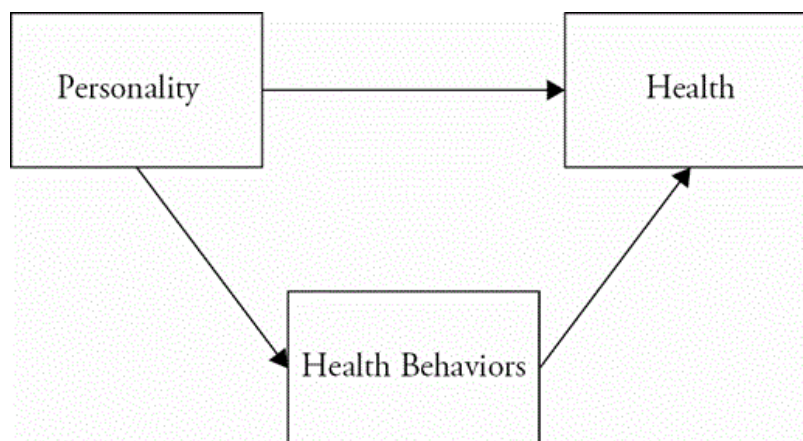
Overall, these studies hint at the protective role conscientiousness may provide in buffering against the detrimental effects of other traits that typically increase the risk of using health-damaging behaviors.

The Health Behavior Model of Personality

Two relatively separate literatures have emerged in the personality field: one explores connections between personality and behavior, and the other focuses on personality and health. Because personality has been associated with both behaviors and health outcomes, and because health behaviors are strongly predictive of health outcomes, researchers have begun connecting the empirical dots to explicate how personality influences health through the behaviors one engages in. This hypothesis was formalized by Smith (2006) in what is now called the *health behavior model of personality* (Figure 22.1).

The model suggests that individuals with certain personality characteristics are more or less likely to engage in certain behaviors, and engagement in these behaviors will ultimately influence health and well-being over time. For example, a person scoring higher in trait neuroticism is more likely than those scoring lower in neuroticism to use alcohol and tobacco to alleviate negative affect and stress. Although there may be little to no negative health consequences in the short term, in the long term, abuse of such substances may adversely impact health and longevity. In other words, behavioral choices explain why dispositional traits predict who is more or less likely to experience long-term health consequences decades later.

Figure 22.1



Adapted Smith's (2006) health behavior model of personality.

Although there are ample findings regarding the associations between personality and behavior (e.g., alcohol and tobacco use; Bogg & Roberts, 2004), as well as between behavior and health (e.g., substance use and longevity; Mokdad, Marks, Stoup, & Gerberding, 2004), there are important limitations to consider when making conclusions on these separate findings. First, in studies that include personality, behavior, and health in the same model, most have included behavior simply as a covariate. If personality does not predict health with the behavior variable in the model, authors often conclude there is no significant personality effect on health. However, it may be that personality traits do not directly influence particular health outcomes, but do so indirectly through health behaviors, as suggested by several models of personality and health (e.g., Adler & Matthews, 1994; Smith, 2006). Thus, behavioral variables should not be treated as a standard covariate or confound, but rather mechanisms that connect personality to health outcomes.

Second, researchers may also focus on the size of the reduction in the associations between personality and health when a behavioral variable is added to the model. A drop in variance explained by the personality trait

when behavior is in the model suggests there might be an explanatory pathway present via the behavior, but this kind of inquiry does not constitute a formal test of mediation, and definitive conclusions of significant mechanisms cannot be made. Thus, convincing empirical support for the HBM of personality is lacking, particularly in the utilization of longitudinal data in large national samples. As discussed further in this chapter, we have addressed this limitation in part with several key studies using the longitudinal MIDUS data.

MIDUS: Exploring Associations Between Personality and Health Behavior

Exploring connections between personality and health in MIDUS has been done with 26 adjectives from the Midlife Development Inventory (MIDI; Lachman & Weaver, 1997). Individuals report on a scale from 1 (*not at all*) to 4 (*a lot*) how well each adjective describes themselves. Scores on each adjective are averaged such that higher scores indicate higher standing on that trait. These continuous scores for each trait are scored on a continuum, such that every individual can be scored on a percentile for each personality dimension. It is this variability that is associated with either more optimal or detrimental health behaviors. The MIDI is brief in comparison to other substantive Big Five measures, but it has good construct validity (Mroczek & Kolarz, 1998), adequate reliability (ranging from .68 to .80), significant correlation with the more expansive NEO-PI trait scales (Prenda & Lachman, 2001), and strict measurement invariance across different ages (Zimprich, Allemand, & Lachman, 2012). Although the MIDI measure adequately captures personality, the Big Five traits by construction are broad and present an overarching hierarchy with more specific facets for each trait. Although facet-level analysis is not available with the MIDI measure due to its brevity, other measures in the MIDUS study offer researchers more finely grained individual difference factors to predict behavior and health. For example, aspects of trait anger, self-efficacy, sense of purpose, and perceived control are also important predictors of behavior and health. Although important, the focus in this chapter is predominantly on studies using the Big Five taxonomy.

Associations Between Personality and Substance Use Behaviors

The collection of MIDUS 1 data in 1995–1996 coincided with a growing interest in the field of health psychology to identify psychological characteristics associated with detrimental health behaviors. Personality psychologists quickly realized the robust predictive power the Big Five personality traits had on such behaviors. Although there are caveats to the general findings that we discuss further in the chapter, typically higher levels of conscientiousness and agreeableness are associated with more optimal health behaviors, while higher levels of neuroticism, extraversion, and openness are associated with more detrimental behaviors. In addition, in MIDUS and other studies, findings are most robust for conscientiousness and neuroticism. We focus here on links between traits and substance use behaviors involving alcohol, tobacco, and drug use.

A first key study using MIDUS data involved examination of the full Big Five on several different substance use behaviors using both cross-sectional and longitudinal data (Turiano, Whiteman, et al., 2012). To investigate associations between personality and alcohol use, zero-inflated Poisson models were utilized due to the fact that approximately 41% of MIDUS participants reported either never drinking alcohol in their life or not having had a drink in the past month. Scoring lower in conscientiousness and higher in neuroticism and extraversion was associated with a greater probability of heavier alcohol use. In addition to baseline levels, those who increased in neuroticism and openness over the 10-year period between MIDUS 1 and 2 had an even greater risk of using alcohol. In addition, those who became more agreeable decreased their probability of greater alcohol use. Because alcohol use, in and of itself, may not be problematic, we also

examined whether personality level and change predicted odds of experiencing alcohol-related problems (e.g., having emotional problems because of alcohol use). Lower levels of conscientiousness and agreeableness and higher levels of neuroticism were associated with greater odds of reporting alcohol-related problems. In addition, increases in these traits were associated with reduced or increased odds (respectively) of experiencing alcohol-related problems over the 10-year follow-up.

To examine smoking behavior over time, Turiano, Whiteman, and colleagues (2012) used lifetime smoking history as well as prospective 10-year change in smoking behavior from MIDUS 1 to MIDUS 2. Four groups were generated: those who never smoked until 2005, those who smoked at both MIDUS 1 and MIDUS 2, those who started smoking between MIDUS 1 and 2, and individuals who had quit smoking at some point by MIDUS 2. Using never smokers as the referent group, those scoring higher neuroticism and openness and lower conscientiousness had increased odds of continuing to smoke over the follow-up period. Although only 25 participants started smoking between MIDUS 1 and 2, those lower in conscientiousness and higher in openness had increased odds of smoking initiation. Last, those scoring higher on neuroticism and openness and lower on conscientiousness were more likely to be former smokers compared to a never smoker. In a related project, we found that lower levels of conscientiousness were equally predictive of not only smoking status, but also the number of years someone smoked and the greatest number of cigarettes someone smoked in their heaviest year of smoking (Turiano, Chapman, Gruenewald, & Mroczek, 2015). These findings advanced understanding of how personality is associated with smoking behavior because prior studies had concentrated primarily on neuroticism and not the other Big Five traits. After adjusting for neuroticism, conscientiousness emerged as a protective factor and openness as a risk factor. Moreover, the study examined lifelong smoking behaviors rather than short arbitrary follow-ups. In sum, a clearer picture emerged that several personality traits are involved in the initiation and maintenance of smoking behavior.

The final outcome examined by Turiano, Whiteman and colleagues (2012) involved use of illicit and prescription drugs. Although substance use rates in MIDUS are low (likely due to the sample having somewhat higher incomes and educational levels than the general population), several personality traits predicted substance use, both cross-sectionally and longitudinally. Utilizing data from 10 different substances, two drug use variables were constructed to document whether the respondent had used any illicit substance (cocaine, marijuana, cocaine, or hallucinogens/LSD) or misused any prescription drugs (sedatives, tranquilizers, stimulants, painkillers, depression medications, or inhalants) over the last 12 months. Approximately 5% of the MIDUS sample had used an illicit drug, while 10% had misused prescription drugs over the prior year. Controlling for levels of prior substance use, analyses revealed that higher levels of neuroticism and lower levels of conscientiousness predicted an increased odds of using illegal drugs and misusing prescription drugs. In addition, higher levels of openness predicted increased odds of using illegal drugs.

When examining mean-level changes in personality as predictors of engagement from MIDUS 1 to 2, participants who increased in neuroticism and openness also increased their risk of abusing substances. Those scoring higher in neuroticism may engage in illicit and prescription drug use because they are self-medicating their feelings of anxiety or depressed affect. For those low in conscientiousness who engage in substance use, they may do so because they do not possess the self-control, discipline, or long-term planning needed to refrain from such substance use. The finding for openness was counter to hypotheses because openness and related facets (such as intelligence and creativity) are typically associated with more optimal health and psychological functioning, such as greater well-being and reduced stressor response (Ozer & Benet-Martinez, 2006; Williams, Rau, Cribbet, & Gunn, 2009). It may be that some may try illegal drugs or misuse prescription drugs as experimentation. Even with a relatively “drug-free” sample of participants, MIDUS is a notable resource regarding the aging of the baby boom generation. It will be interesting to examine whether this cohort of individuals experiences lower or higher rates of drug use in older adulthood.

Overall, this study advanced the field via its use of a large national sample with a wide age range to document how multiple Big Five traits were predictive of several substance use behaviors that could impact health over one's life span. Key prior studies, in contrast, had been largely restricted to college-aged samples from select geographic regions and therefore having limited generalizability to the US population. Moreover, examining how trait changes (increases or decreases across time) predicted substance use as well as changes in substance use provided further evidence of the persistence of personality effects on a wide range of health behaviors over time. Building on these findings, the next step was to conduct a full test of the HBM of personality using MIDUS data.

Examining the Full Health Behavior Model of Personality

Findings from MIDUS (and elsewhere) documented associations between personality and behavior and between behavior and health outcomes, suggesting that behaviors may, in fact, explain why personality is associated with health. Extending seminal work from Ploubidis and Grundy (2009) on how to test mediation with a complex outcome such as mortality, we utilized MIDUS data to conduct a full test of the HBM of personality (Turiano et al., 2015), specifically whether health behaviors mediated the association between conscientiousness and 14-year mortality risk. Lower levels of conscientiousness predicted an increased hazard of dying over the follow-up period, and by using a product-by-coefficients approach to testing the significance of indirect effects, several behaviors emerged as significant mediators of this association. Those scoring lower on conscientiousness were more likely to drink greater amounts of alcohol, to smoke cigarettes, and to have a greater waist circumference. Although waist circumference is not a health behavior, it is indicative of dietary habits and activity levels and thus serves as a proxy for behavior. In sum, these sets of behavioral indicators explained specifically why individuals scoring lower in conscientiousness are more likely to suffer worse health and heightened mortality risk.

These findings paralleled meta-analyses showing that conscientiousness is associated with leading behavioral choices associated with poorer health and increased mortality rates (Bogg & Roberts, 2004). Our contribution also laid out how future research could explore connections between personality, behavior, and health outcomes to answer Hampson's (2012) question of how "personality traits get outside the skin." Such efforts have recently been replicated in over a dozen studies examining associations among personality traits, smoking behaviors, and mortality (Graham et al., 2017).

Conscientiousness as a Key Moderating Factor

Using typically small and restricted samples, only a handful of studies have examined trait-by-trait interactions. MIDUS thus provided a key opportunity to test such interactions with the sociodemographic heterogeneity of a national sample. We set out to test the idea of "healthy neuroticism," a hypothetical concept introduced by Howard Friedman (2000). Typically, higher levels of neuroticism have been associated with increased use of substances to alleviate feelings of anxiety and stress. However, Friedman (2000) proposed that there may be a different life path for someone high in neuroticism, namely, neurotic vigilance, wherein high levels of neuroticism lead to engagement in more optimal behaviors due to being overly concerned about health.

Findings from MIDUS confirmed this idea via a significant conscientiousness-by-neuroticism interaction (Turiano, Whiteman, et al., 2012). Those scoring higher in neuroticism were at an increased risk of greater alcohol use and having alcohol-related problems. However, when conscientiousness levels were also high, alcohol use and related problems were not elevated. In other words, though neuroticism may pose a risk for problematic alcohol use, being highly conscientious may help to buffer this risk, possibly because more conscientious individuals are better able to self-regulate their behaviors. Similarly, those scoring higher in extraversion were more likely to use illegal drugs, but not when conscientiousness levels were also high.

Testing conscientiousness as a buffer against high neuroticism and extraversion is the beginning of exploring these interactions in MIDUS. Going forward, using tests of moderation as well as cluster analytic approaches for personality “types” may lead to a more precise understanding of how individual difference variables predict behavior.

In fact, as an extension of work on the neuroticism-by-conscientiousness interaction, we asked whether neurotic individuals who were also conscientiousness refrained not only from self-medicating with substances but also if they would have a physiological risk comparable to those scoring lower in conscientiousness. Using the Biomarker subproject of MIDUS, we found that the neuroticism-by-conscientiousness interaction significantly predicted levels of interleukin 6 (IL-6; Turiano, Mroczek, Moynihan, & Chapman, 2013). Specifically, those scoring higher in neuroticism and higher in conscientiousness actually had lower (more optimal) IL-6 levels. This study was novel for showing that “healthy neurotics” not only engage in fewer detrimental substance use behaviors than typically “unhealthy neurotics,” but also have optimal physiological functioning. Further exploration of the healthy neurotic in both MIDUS and other samples is clearly needed to understand how traits interact to predict important behaviors and outcomes.

Beyond Personality Traits

Although the current chapter has focused on the Big Five personality traits, given their prominence in the field and consistent measurement in MIDUS, it is worth considering additional dispositions in this dataset. For example, individual differences in control beliefs have emerged as important predictors of behavior and health across adulthood. Those who perceive fewer constraints and have greater ability to set and meet goals in their lives tend to engage in healthier behaviors, have better health, and live longer (Lachman, 2006; Turiano, Chapman, Agrigoroaei, Infurna, & Lachman, 2014). The protective effect of perceived control is so strong that it buffers the well-known negative effects low socioeconomic status has on mortality risk. Specifically, we utilized 14-year mortality information to first show that those with lower levels of education were more likely to die over the follow-up. However, those who had less than a college degree and perceived greater control over their lives did not have the elevated mortality risk evident among those with low educational attainment and lower control beliefs. This research thus demonstrated the protective effect perceived control can have on health and longevity.

Individual differences in sense of purpose in life are also important for health and well-being. Work with MIDUS has shown that sense of purpose in life longitudinally predicts allostatic load (Zilioli, Slatcher, Ong, & Gruenewald, 2015) and mortality risk (Hill & Turiano, 2014), even when controlling for other indicators of well-being. Moreover, an individual’s sense of purpose may be linked to similar behavioral pathways as suggested for the Big Five, such as physical activity (Hooker, Masters, & Carey, 2014) and better use of preventive health care (Kim, Strecher, & Ryff, 2014). Recent work has also demonstrated that healthy behaviors mediate associations between sense of purpose and self-reported health (Hill, Edmonds, & Hampson, 2017). In summary, other dispositional traits, in addition to the Big Five, are also showing meaningful links to behavior and health.

Future Directions Using MIDUS Data

There is much we still do not know about the personality–health associations. We propose three key advances that could fruitfully be initiated in future MIDUS research. First, using three full waves of longitudinal data, it will be possible to reliably estimate change and directionality of effects and to establish the temporal ordering of mediational effects. Second, we propose to leverage findings from the main sample with findings from other MIDUS subprojects (e.g., daily diary study, Biomarker sample). Third, we propose investigating factors that modify associations between personality, behavior, and health, knowing that “one size fits all” rarely is the case in psychological and behavioral research. That means future work focused on age, gender, race, and other demographic factors can richly refine knowledge of how change in personality characteristics and health unfold over time among different sets of individuals.

The addition of MIDUS 3 provides an immensely valuable third measurement point that is essential for reliably estimating change (Singer & Willett, 2003). For example, growth curve modeling techniques can be utilized to examine changes in behavior over time and determine whether personality predicts variability in these longitudinal changes. It is also possible to examine correlated changes between personality and behavior with latent growth modeling approaches. Such longitudinal analyses are needed to determine precisely how personality and behavior change over time. These are not static factors: Personality traits and health behaviors both change with increasing age, so the dissemination of MIDUS 3 data combined with advances in longitudinal statistical modeling approaches provide a rich foundation for such future analyses.

Relatedly, one of the most important questions that needs to be addressed is the bidirectionality of effects between personality and behavior. The models we described previously in the chapter simplistically focus on unidirectional effects from personality to behavior. However, engagement in certain behaviors can reinforce or challenge certain personality characteristics; thus, it is important to test for bidirectional effects and examine the relative strength of personality–to–behavior and behavior–to–personality associations. Autoregressive latent trajectory modeling (Bollen & Curran, 2004) offers one approach to untangling these bidirectional effects, although more than three waves of data will be needed, thus underscoring the need for continued data collection in MIDUS.

The amount of cross–sectional research connecting personality and behavior is impressive, but there are obvious limitations with such studies. Namely, the lack of established temporal associations undermines the ability to assess the mechanisms that explain why personality and health are associated. We previously discussed the importance of formally assessing mediation (see previous HBM sections). However, there also needs to be temporal ordering established to show the purported cause preceded the purported effect (Preacher, 2015). In other words, it is critical to ascertain whether personality comes first, which then leads to behavior, which then ultimately leads to change in health outcomes. Utilizing predictors at MIDUS 1, behavioral mediators at MIDUS 2, and outcomes at MIDUS 3 will provide the full test to determine the mechanisms by which personality predicts health (Maxwell, Cole, & Mitchell, 2011). This evidence is key for informing prevention/intervention programs aimed at improving behavior or health outcomes.

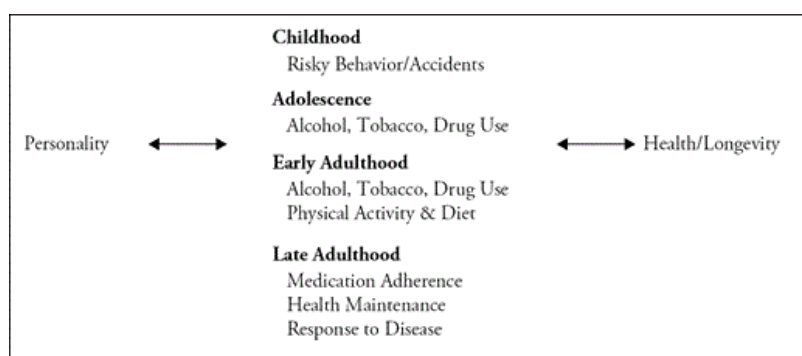
Strengths and opportunities available in the MIDUS survey sample may be even more impactful in understanding factors that influence the aging process via connection to other MIDUS projects. For example, additional tobacco questions included in other subprojects probed use of smokeless tobacco and cigars/pipes. With increasing variability in the use of alternative tobacco products than cigarettes, these data could be usefully linked to personality and other individual difference factors as key predictors of these behaviors. It would also be useful to link the daily diary subproject and related assessments of daily stress to personality–related factors and health behaviors (Aronson, Almeida, Stawski, Klein, & Kozlowski, 2008). Specifically, when individuals report stressors on a specific day, they often self-medicate with cigarettes, but this may not alleviate, or may even worsen, emotional health. Examining smoking behavior over many

years with daily assessments could be fruitful as each of these components provides unique information on how psychosocial variables and behavior are intertwined.

It will also be worthwhile to utilize the large twin sample within MIDUS to explore personality–substance use associations. South and Krueger (2014) utilized a biometric moderation model to examine whether higher levels of conscientiousness moderated genetic and environmental influences on problem alcohol use in twins. Results suggested that conscientiousness and alcohol use problems were negatively correlated, but that the genetic versus the environmental risk for having alcohol problems was moderated by conscientiousness. At high levels of conscientiousness, the risk for alcohol problems was more related to genetic than nonshared environmental influences. At lower levels of conscientiousness, the risk for alcohol problems was more strongly related to nonshared environmental influences than genetic influences. The authors argued for co-twin control methods that will help researchers strengthen causal claims that personality traits are associated with health via specific behaviors. Such research is needed to build successful intervention/prevention strategies to curb problematic behavior so that more optimal aging trajectories can be achieved.

A final area of future study involves consideration of key moderators and moving beyond simple mediation tests to more complex models. For example, the strength of personality–health associations and related explanatory mechanisms may differ by the age and the stage in the life span (Figure 22.2). The life course model of personality (Shanahan, Hill, Roberts, Eccles, & Friedman, 2014) suggests that the mechanisms connecting personality to health may change with age. For example, younger adults may have a greater propensity to experiment with substances such as alcohol and illicit drugs, suggesting a stronger association between personality and substance use at these younger ages. At older ages, there may be stronger associations between personality traits and behaviors such as seeking medical care when disease and disability occur. Thus, it is likely that conscientiousness is associated with health primarily through substance use behaviors in younger adults, while among older adults the links to health are about compensatory behaviors.

Figure 22.2



Life span health behavior model of personality adapted from Smith (2006). Key adaptations include various life span–specific health behaviors and bidirectional pathways. The bidirectional arrows indicate that although personality leads to behaviors, engagement in certain behaviors can feed back into strengthening those personality characteristics. A similar bidirectional process can be seen with behavior and health.

Mechanisms are thus moving targets, meaning that it will be important to ascertain which behavior is a significant mediator at one point in the life span and not at another. Age analyses could also be conducted with the MIDUS Refresher sample, which provides data on same-aged individuals as the original MIDUS sample, but from a different historical period, namely after the Great Recession. Such data allow for assessment of whether associations among personality traits, health behaviors, and health outcomes vary at different historical periods. Finally, socioeconomic differences in these relations are important to

consider. Psychological risk and resilience factors may vary from lower income groups compared to those with greater financial security. The behaviors that explain personality–health associations may also vary by socioeconomic status. Such subgroup analyses constitute valuable future directions for which MIDUS is richly well suited given the scope of health inequalities research within the study.

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