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UNIVERSITY OF CALIFORNIA
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Long-Term Stability of Personality: Implications for Behavior

A Dissertation submitted in partial satisfaction
of the requirements for the degree of

Doctor of Philosophy

in

Psychology

by

Christopher Scott Nave

June 2011

Dissertation Committee:

Dr. David C. Funder, Chairperson

Dr. Sonja Lyubomirsky

Dr. Daniel J. Ozer

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The Dissertation of Christopher Scott Nave is approved:

Committee Chairperson

University of California, Riverside

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The text of this dissertation, particularly from Chapter 2, is in part a reprint of the material that appears in:

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ABSTRACT OF THE DISSERTATION

Long-Term Stability of Personality: Implications for Behavior

by

Christopher Scott Nave

Doctor of Philosophy, Graduate Program in Psychology

University of California, Riverside, June 2011

Dr. David C. Funder, Chairperson

After vigorous debate regarding the validity of personality traits, a growing body of research demonstrates that personality a) is quite stable across the lifespan and that b) personality matters because it predicts important outcomes of interest. One important, yet understudied area of research involves how personality traits manifest in a wide variety of behaviors both across contexts and over time. Understanding the relationship between personality and behavior yields a deeper understanding of the underlying mechanisms for how personality predicts important outcomes. The continuity of personality's association with directly observed behavior is demonstrated in two different studies. In Study 1, during the 1960s, elementary school teachers rated personalities of members of the ethnically diverse Hawaii Personality and Health Cohort (Hampson & Goldberg, 2006). The same individuals were interviewed in a medical clinic over 40 years later. Trained coders viewed video recordings of a subset of these interviews ($N = 144$, 68 F, 76 M) and assessed the behavior they observed using the Riverside Behavioral Q-sort Version 3.0 (Funder, Furr & Colvin, 2000; Furr, Wagerman & Funder, 2010). Teacher ratings of children had numerous and diverse correlations with behavior coded in the interview.

Children rated by their teachers as “verbally fluent” (defined as unrestrained talkativeness) showed dominant and socially adept behavior as middle-aged adults. Early “adaptability” was associated with cheerful and intellectually curious behavior, early “impulsivity” was associated with later talkativeness and loud speech, and early rated tendencies to “self-minimize” were related to adult expressions of insecurity and humility. In Study 2, between 1999-2001, a nearly identical but slightly larger subset of the Hawaii Personality and Health Cohort (N = 155, 77 F, 78 M) provided self-reported ratings of the Big Five. Each of the Big Five personality characteristics were meaningfully associated with directly observed behavior 2 to 9 years later. It is difficult to avoid the conclusion that these results, along with others already in the literature, show that personality resides *within* people, and is manifest through behavior in diverse ways across the varied settings of life.

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Chapter 1: Introduction

“Doing a longitudinal study means wrapping an albatross around one’s neck, placing a monkey on one’s back, mounting a tiger, and grabbing a bear by its tail.” (Block & Block, 2006, p. 321)

Individuals differ on a variety of characteristics. These characteristics, or personality traits, have been studied in the psychological domain since the early 20th century. Despite controversy over the validity of personality traits, researchers now have a convincing body of research that demonstrates that personality 1) is remarkably stable across the lifespan and that 2) traits reliably predict consequences of interest across the lifespan. One consequence of interest within personality psychology is the relationship between one’s personality and the behaviors that one exhibits. The current work expands on our understanding of personality and its relationship with behavior by a) connecting childhood ratings of personality by schoolteachers with directly observed behavior in two very different contexts over four decades later and b) connecting adult self-ratings of personality to directly observed behavior years later. In particular, the research is one of the first studies to empirically relate personality with a wide range of directly observed behaviors across the lifespan, furthering our understanding of how personality relates to important outcomes and behaviors.

Personality

Personality is defined as an individuals' characteristic patterns of emotion, thought, and behavior and the underlying mechanisms behind these patterns (Funder, 2010). Notably, although behavior is an important characteristic to understanding personality, behavior in and of itself is not sufficient in understanding one's personality. Behavior is thought to be, at least in part, a reflection of one's underlying personality. For example, if someone is high on sociability, one would expect that person to behave in a friendly, gregarious way in most interpersonal situations. The breadth of the term personality has led psychologists to examine specific subcomponents of personality, such as personality traits. When thinking of what a personality trait is, the current paper uses one of the most encompassing definitions in that a trait is any individual difference variable (but see McAdams, 1995 for a more nuanced account). In a seminal paper on personality traits, Allport (1931) systematically broke down how to study and think about personality traits. A fundamental principle to understanding traits is in the determinative and dynamic fashion in which traits operate. Subsequent research has empirically demonstrated this point, namely that personality predicts important life outcomes and behaviors. A second fundamental principle regarding traits is the idea that any behavior, act, or habit inconsistent with a particular personality trait does not disprove the existence of that particular trait (Allport, 1931). Consider an individual who is high in conscientiousness and is driven to succeed, arrives early to business and social functions, yet is sloppy in appearance. His sloppiness does not negate the other conscientious behaviors that he routinely displays. Similarly, any particular observation of a behavior is

not perceived as a perfect indicator of an underlying personality trait. A person who does not behave in a sociable manner in one situation does not rule out the possibility that the person may be high in sociability, *on average* (Block, 2008). A third principle key to understanding personality traits is that traits do not have to be and often are not independent of one another. Contemporary theory has further suggested a biological basis associated with personality traits (e.g., McCrae & Costa, 1999), which implies consistency in the mean-level of a particular personality trait across time.

The Person-Situation Debate

To an important degree, behavior is determined by the context in which it occurs. Psychology's recognition of this important fact has led, in some cases, to a denigration of the complementary importance of the personality of the individual who performs the behavior. One result was the "person-situation debate", which was a major theme of personality research for more than 40 years (Donellan, Lucas & Fleeson, 2009; Kenrick & Funder, 1988; Mischel, 1968).

The major impetus of the "person-situation debate" was Walter Mischel's book "*Personality and Assessment*" (1968). In the book, Mischel argued that when examining behavior, researchers should focus more on the psychological properties of the situation than the psychological properties of a person. In studies that looked at personality traits predicting behavior, Mischel argued a ceiling existed with it being near-impossible to obtain a correlation above $r = .30$. Correlations of .30 or less in Mischel's eyes, are far too low because they account for too little variance explained to assume that the

underlying personality trait is reliably related to a particular behavior. As a result Mischel (1968) implied that personality was not consistent enough across contexts and across time to use to predict behaviors or outcomes of interest.

In the 1970's- 1980's numerous rebuttals of Mischel's argument that personality traits are too inconsistent to meaningfully predict behavior were offered (e.g., Block, 1977; Epstein, 1977, 1979; Kenrick & Funder, 1988; McCrae, 1982). The conclusion from numerous rebuttals was that personality does meaningfully predict behavior and outcomes of interest. In fact, the supposed ceiling of personality-behavior relationships at $r = .30$ is greatly misinterpreted as being such a small effects size as to warrant little attention towards it. Under the variance-partitioning approach, a correlation of $.30$ explains "only" 9% of the variance between two relationships. This philosophy led Mischel (1968) and others to wrongfully attribute the vast majority of the remaining 91% of variance as a property of the situation, without ever actually directly measuring the properties of a situation, or without taking into account measurement error (Block, 1977; Hogan, DeSoto, & Solano, 1977). The best way to understand correlations as effects sizes is to interpret the original non-squared r value (Ozer, 1985). Using a technique developed by Rosenthal and Rubin (1982), the binomial effects size display (BESD), we realize that a correlation with a magnitude of $.30$ will yield correct discrimination 65% of the time (when using a dichotomous criterion). Not only has a correlation value of $.30$ been demonstrated to be a meaningful effects size, when examining powerful social psychological phenomena and translating their effects sizes into an effects size r , we see nearly identical effects sizes for powerful situational manipulations as obtained in

personality research (Funder & Ozer, 1983). Demonstrating that effects sizes of $r = .30$ are in fact worth studying, that effects sizes in social psychological domains typically are in the $r = .30$ range, and several other important arguments (e.g., about aggregation of behaviors, see Epstein 1979; Kenrick & Funder, 1988) psychologists renewed their activity in studying personality and in trying to determine the extent to which personality is stable and consistent across situations or across time.

Personality Stability

Just how stable is a particular personality trait within someone? If someone is a sociable child, will they be a sociable teenager, a sociable adult, a sociable elderly member of society? One theory, the *radical contextual perspective* (Caspi & Roberts, 2001; Caspi, Roberts, & Shiner, 2005) asserts that personality traits are likely to change over time which would yield universally low personality stability coefficients. For example, a sociable child will be largely influenced by the environment they are surrounded by and the diverse roles and motivations that one may have across the lifespan. As a result, there would likely be a miniscule relationship between sociability as a child and sociability as an adult. A second theory about personality stability, the *biological essentialist perspective* (Caspi, Roberts, & Shiner, 2005) posits that personality traits have a large biological component to them and therefore will remain universally highly stable across time. A third theory, the *compromise perspective* (Ferguson, 2010) argues that a moderate degree of stability exists, but that environmental

influences also play a role in tempering stability or encouraging personality change throughout the life-span.

There have been several studies that demonstrate that personality traits are indeed stable across the life-span (Caspi, Roberts, & Shiner, 2005; Roberts, Walton, & Viechtbauer, 2006; Roberts & DelVecchio, 2000) and primarily in mid-adulthood (e.g., Costa & McCrae, 2006; McCrae & Costa, 1982). Previous research on the Hawaii Personality and Health Cohort (Hampson & Goldberg, 2006) has demonstrated consistency between teacher ratings of personality (e.g., extraversion, agreeableness, conscientiousness, intellect) in elementary school and self-reported personality decades later.

A previous meta-analysis of personality traits concluded that personality is highly stable across the adult life-span (Conley, 1984). Similarly, in the most recent and comprehensive meta-analysis investigating personality stability, clear evidence supports the notion that personality is in fact remarkably stable across the life-span (Ferguson, 2010). In the 47 studies investigated, the average personality stability coefficient (uncorrected for measurement error) was $r = .60$. What is remarkable about such a large stability coefficient is that the average stability coefficient was found regardless of age in the sample (although young childhood stability coefficients tended to be smaller than other age groups), the trait examined, the gender, nationality, or even whether studies looked at a clinical or nonclinical sample. Even individuals who go to therapy with the expressed desire to change their personality, seem to remain remarkably stable in their

personality (Ferguson, 2010). Taken together these findings provide strong evidence for personality being stable across the life-span.

Importance of Personality: Connections to Major Life Outcomes

Substantial support exists for the notion that personality traits are stable. Once we establish the stability of personality, we can begin to ask important questions concerning the relationship between personality and other psychological variables. For example, are personality traits related to important outcomes of interest? A good deal of evidence already suggests that personality has an influence on behavior that to some degree transcends immediate context. For example, strong correlations have been reported between the directly-observed behavior of individuals in one laboratory situation and their behavior in another (e.g., Funder & Colvin, 1991). Teachers' ratings of the personalities of children as young as 3 or 4 years old have been found to be meaningfully connected with behavioral assessments made in the laboratory a dozen years later (e.g., Funder & Block, 1989; Funder, Block & Block, 1983).

One domain that has been examined is college students and their academic success in college. Schools will traditionally look to high-school GPA and SAT scores to predict college performance. A recent study provided compelling evidence that we should be using personality to predict academic achievement (Wagerman & Funder, 2007). Self and informant ratings of conscientiousness were found to predict both freshman and senior GPA in college. What was particularly striking about this study was that conscientiousness uniquely predicted senior GPA even when accounting for high-school

GPA, SAT scores, and freshman GPA, which were included in a regression model. The take home message of the study is that personality, in this case, conscientiousness, appears to predict college success better than merely looking at high-school GPA or SAT scores (Wagerman & Funder, 2007).

Does one's personality predict important life outcomes outside of the academic domain? In a broad literature review of studies using the Big Five personality traits, all five personality traits were found to be meaningfully related to individual and social institutional outcomes and four out of the five personality traits (extraversion, agreeableness, conscientiousness, neuroticism) were related to various interpersonal outcomes (Ozer, & Benet-Martinez, 2006). For example, agreeableness is positively related to individual outcomes like gratitude and forgiveness, interpersonal outcomes like peer acceptance, and social institutional outcomes like being less likely to work at a job solely for extrinsic success. Examples for people high in extraversion include greater well-being, reduced psychopathology, romantic relationship satisfaction, and increased volunteerism. Examples for those high in neuroticism include poorer coping abilities, decreased relationship satisfaction, and less financial security and success. Finally, examples for people high in openness to experience include increased tendency to engage in substance abuse, have increased existential/phenomenological concerns, increased artistic interests, and increased occupational success (Ozer, & Benet-Martinez, 2006).

Can we find meaningful associations between one's personality and specific, important life outcomes such as the type of employment that we have, whether we will stay married to our spouse, or even whether or not we will live longer? A recent meta-

analysis examined the predictive power of personality, cognitive ability, and socioeconomic status (SES) on three important life outcomes: occupational attainment, divorce, and mortality (Roberts et al., 2007). To be included in the meta-analysis, studies must have been prospective and longitudinal in design. Personality traits like conscientiousness, extraversion, and others were found to predict educational outcomes (average standardized beta = .23) better than parental outcomes (average standardized beta = .14) or SES (average standardized beta = .09) and nearly as well as IQ (average standardized beta = .26). When examining how personality is related to divorce, results showed that low conscientiousness (average $r = .14$), low agreeableness (average $r = .16$), and high neuroticism (average $r = .17$) were all more associated with divorce than SES (average $r = .05$). Finally, when comparing how personality, SES, and cognitive ability are related to mortality, results indicated that low conscientiousness has the largest association with mortality (average $r = .09$), followed by low extraversion and positive emotionality (average $r = .07$), then low IQ (average $r = .06$), neuroticism (average $r = .05$), low agreeableness (average $r = .04$), and finally low SES (average $r = .02$). Taken together, these results demonstrate the importance that personality plays in major life events, particularly given that personality is meaningfully associated, or predicts important life events as good as or better than traditionally used indices like SES and cognitive ability variables like IQ (Roberts et al., 2007).

Knowing that adult personality predicts important life outcomes lends additional support to the notion that personality is worth studying and that personality matters. But what about childhood personality? Do we find meaningful associations between one's

personality as a child and important life outcomes years and perhaps even decades later? The complexity of studying aspects of personality from a young age and then relating it to important life events years later should be noted. As such, there has not been a large amount of research examining this topic. However, at least a few important studies have demonstrated robust relationships between child personality and life outcomes. One such study demonstrated that, even when childhood IQ was controlled for, adolescent ratings of agreeableness, conscientiousness, neuroticism, and extraversion predicted occupational status 46 years later (Judge, Higgins, Thoresen & Barrick, 1999). Research by Walter Mischel and colleagues showed that delay of gratification observed in preschool predicted cognitive and academic competence as well as coping with stress years later, in adolescence (Mischel, Shoda, & Peake, 1988; Shoda, Mischel, & Peake, 1990).

Another rare prospective study of child personality and life outcomes is the Dunedin longitudinal study (e.g., Caspi, 2000), a study using a near complete birth cohort over the period of a year from Dunedin, New Zealand. At age 3, over 1,000 children were assessed during a 90-minute testing session by independent examiners on a variety of temperament-like behaviors, such as impulsive, shy, friendly, and self-confident. Children had follow-up assessments approximately every two years through adulthood, where self-report, informant report and official records were collected at the various time-points. Children who were inhibited at age 3 were likely to have fewer sources of social support as well as more likely to be depressed and unassertive by age 21. Undercontrolled children at age 3 were more likely at age 21 to attempt suicide and

engage in various criminal offenses. In addition, undercontrolled children at age 3 tended to be antisocial, unreliable, impulsive, and had more conflict with their peers at age 21.

Another prospective longitudinal design utilized a sub-sample of 569 subjects from the National Collaborative Perinatal Project (NCPP) and assessed personality at age 7 as well as adult midlife health (Kubzansky, Martin, & Buka, 2009). Children were assessed on a variety of behaviors by trained psychologists at age 7. Children at age 7 who had high attention reported fewer illnesses and better self-rated health as adults compared to children low in attention. Children rated as more distress-prone at age 7 tended to report more illnesses and worse self-rated health compared to children who were not rated as distress-prone (Kubzansky, Martin, & Buka, 2009).

The LOGIC dataset (e.g., Asendorpf, 1994) used teacher judgments of behavior and personality at age 4 to predict later behavior in the same context over six years later. Socially competent children at age 4 were found to reduce inhibition in school and laboratory settings at age 10 whereas children who were not rated by teachers as socially competent were not able to change their initial inhibited behaviors at age 10 (Asendorpf, 1994).

In a 30-year longitudinal study of 128 nursery school children, Jack and Jeanne Block and their colleagues demonstrated, through numerous publications, that key personality variables such as ego resiliency and ego control were correlated with experimentally observed behavior and important life outcomes assessed over the years (Block & Block, 2006). Childhood ratings of personality have even been found to be

related to mortality, with conscientiousness as a child being associated with mortality ($r = .09$) in the Terman Life Cycle Study (Friedman et al., 1995).

Behavior

Examining what people do is a vital component of psychology. In its most basic form, behavior can be conceptualized simply as by what an organism does or says (Watson, 1925). An updated and more nuanced account of behavior is that it is “verbal utterances or movements that are potentially available to careful observers using normal sensory processes” (Furr, 2009, p.372). Defining behavior in this capacity emphasizes the social implications and direct consequences that a behavior may have and de-emphasizes internal or external physiological responses. The rationale for describing behavior as “potentially available” is to account for behaviors that occur alone but could be described by someone if they were in attendance (Furr, 2009).

One reason why it is so important to study behavior is that behavior is an important manifestation of our feelings, thoughts, and desires. Similarly, studying behavior helps us gain a better understanding of personality and specifically how traits are manifest in behavior. This in turn helps us gain a better understanding of a particular trait in and of itself. Studying behavior allows for the examination of personality constructs in a concrete, observable manner (Furr, 2009). Another reason for the importance of studying behavior is that it acts as an explanatory mechanism of underlying psychological properties: Behavior can help us understand *why* personality relates to job satisfaction, or work performance, or happiness (Jackson et al., 2010).

The American Psychological Association (APA) labeled the first decade of the turn of the century the “decade of behavior” (Azar, 1999). Despite the importance of behavior and the supposed commitment by the APA to encourage examining behavior, behavior has been found to be largely understudied (Agnew, Carlston, Graziano, & Kelly, 2010; Baumeister, Vohs, & Funder, 2007; Furr, 2009; Robins, Tracy, & Sherman, 2007). In one analysis it was concluded that in the field of social and personality psychology, there has been a steady decline in the examination of behavior since the early 1980’s (Baumeister et al., 2007). In 2006, less than 20% of studies published in the *Journal of Personality and Social Psychology* examined any direct observation of behavior (Baumeister et al., 2007). A different approach to understanding the use of behavior in psychological research examined editorial boards of three personality journals (Robins, et al., 2007). Editorial board members were questioned about the use of behavioral observation in their journals. It was found that published articles in their journal used direct behavioral observation and any form of “behavioral responses” less than “somewhat frequently” (Robins et al., 2007). Finally, in the most extensive survey of the use of behavior in personality research, Furr (2009) examined all issues of the *Journal of Personality (JP)* published in 1997, 2002, and 2007, as well as odd-numbered issues of the *Personality Processes and Individual Differences* section of the *Journal of Personality and Social Psychology (JPSP)* published in 1997, 2002, and 2007. Of the more than 350 published quantitative studies sampled (e.g., no review papers or meta-analyses were included in the analysis), only 16-24% of them included behavioral data. Direct behavioral observation was employed in just 5% of all articles sampled (Furr,

2009). Taken together, it is quite apparent, at least within the areas of personality and social psychology, that studying behavior is rare. This is unfortunate for a number of reasons, including that we have a limited understanding of the relationship between personality traits and a wide range of representative behaviors that should make up a particular trait (Jackson et al., 2010).

When behavior is studied, it tends to be self-reported, or limited to a few ad hoc dimensions or, even more frequently, just one (Baumeister et al., 2007; Furr, 2009). Self-reported behaviors are typically retrospective in nature and are filtered through one's biases and heuristics. There rarely is a chance to independently verify what someone is claiming to have occurred when obtaining behavioral ratings in a self-report, non-observed manner. Although there is very little cost to researchers (i.e., time and money) when using self-reported behavior, better ways exist to obtain behavioral ratings. Examples of strong behavioral data include using acquaintances' reports of recent behavior, experience sampling of behavior, and direct behavioral observation (Furr, 2009). What makes each of these methods "strong" is the minimal impact that social desirability, memory biases, and other self-reported response biases have in the actual rating. Note that each of the strong behavioral methods are not without their flaws.

Direct Behavioral Observation

The methodology that may be closest to investigating what people are actually doing is direct behavioral observation. As previously mentioned, researchers rarely employ direct behavioral observation, which is unfortunately because a number of unique

strengths behind utilizing direct behavioral observation exist. One major advantage to using direct behavioral observation is that independent observers are describing behaviors they witness, in a controlled lab environment or a more naturalistic environment (Furr, 2009). Obtaining ratings from more than one independent observer also provides the additional benefit of the power of aggregation and the cancellation of any idiosyncracies or biases that a particular individual may carry. Direct behavioral observation ratings occur either in real-time or are derived from video-recordings in which an observer is providing online ratings or a global, summative account of the behaviors just recently witnessed. Any errors associated with recall are limited in this methodology. In addition, direct behavioral observation provides an independent benchmark for establishing the validity of other sources of information about personality (Furr, 2009). Although direct behavioral observation has been considered a “strong” methodology, it is not without its weaknesses. One weakness of direct behavioral observation is in the ambiguity of witnessing a particular behavior: an observer may not be privy to the underlying motivations behind a witnessed behavior. For example, if someone is seen as smiling- are they smiling because they are genuinely happy, because they are nervous or fearful, or to ingratiate themselves to someone else? These underlying motivations would likely yield different interpretations of behavior- or predict important life outcomes differently because in some cases raters of direct behavioral observation may have a poor understanding of *why* a behavior is occurring.

A second major weakness to using direct behavioral observation is the expense of it, in terms of money, effort, and time. Various expenses are associated with recording

behavior digitally, storing, labeling, and editing any of the behavioral sequences that may have been witnessed. People must be recruited to act as coders of behavior. Coders must be attentive at watching and recording behaviors that are occurring. These behavioral ratings then need to be entered and compared or aggregated with other raters. Behavioral coding may or may not involve developing or adapting a coding scheme and training coders to correctly follow the particular scheme. When a participant is aware of being watched or videotaped, they may alter their behavior from how they would naturally behave. Finally, direct behavioral observation tends to capture a very small snapshot of behaviors, typically in a laboratory context (Furr, 2009).

In summary, researchers need to devote more attention to studying behavior, particularly “strong” behavioral data like direct behavioral observation. Those who have extensively examined the frequency and nature by which behavior is studied plead for future research to employ strong behavioral methods and to study a wide range of behaviors (Baumeister et al., 2007; Furr, 2009). In the case of personality psychology, we know that personality remains remarkably stable across the lifespan and that personality is related to several important outcomes of interest. What we have a poorer understanding of is how particular personality traits relate to a diverse set of behaviors, particularly in a longitudinal format. The current study is unique compared to previous research in that it examines the relationship between a) teacher’s ratings of children’s personality in elementary school with a wide variety of directly observed behaviors witnessed in a very different context over 40 years after the initial teacher ratings were made, and b) the

relationship between self ratings of personality with a wide variety of directly observed behaviors that occur years later.

Overview

Chapter 2 uses the ethnically diverse Hawaii Personality and Health Cohort (Hampson & Goldberg, 2006) to examine the relationship between teacher's ratings of elementary student's personality with a diverse set of directly observed behaviors in a hospital setting over four decades later. Chapter 3 uses the same dataset but examines the relationship between self-reports of adult personality with the same directly observed behavioral ratings from a hospital setting obtained years later. Chapter 4 discusses the importance of looking at the mechanisms behind personality stability and outlines future directions for studying personality and behavior.

Chapter 2: On the Contextual

Independence of Personality: Teacher's Assessments Predict

Directly Observed Behavior after Four Decades.

(the content from this chapter is largely adapted from Nave et al., 2010).

Relationship Between Personality and Behavior

Although the point of view that used to be called “situationism” (Bowers, 1973) has evolved over the years into a more sophisticated appreciation of how aspects of persons and situations interact, some psychologists continue to view personality, and its effect on behavior, as inextricably entwined with situational context. As one prominent researcher recently wrote, “...whatever way one chooses to define ‘personality’ it surely is not a de-contextualized ‘entity within the mind’” (Mischel, 2009, p. 289).

This statement represents a point of view that continues to be widely held. The most important word in it is probably “decontextualized”¹: The word implies that personality cannot be separated from context, and that to the degree that the behavior of the same individual might tend to be consistent over time, this must be the result of similarities in the situations he or she encounters. This idea is an empirical question worthy of study and is one of the main purposes for Study 1: to examine the extent to which personality from one context can predict behaviors in a very different context.

¹ The importance of this word is illuminated by the fact that it was added to a quote by another author (Funder, 2009) that was being contested.

However, a strong “contextualist” – if that term is to replace “situationist” – could still point out that laboratory contexts might share an essential similarity, that the distance in time between childhood and early adolescence is small compared to the full lifetime of the adult personality, and that despite the impressive studies of lifetime outcomes few of the analyses mentioned above– particularly the ones spanning long periods of time – include direct observations of behavior.

To answer such a critic, something more is required. First, personality and behavior must be assessed independently in two highly different contexts, and the behavior must be directly observed. Second, an appreciable span of time should pass between the two assessments. If it could be shown that directly observed behavior were to be associated with personality as rated in very different contexts decades earlier, it might be difficult to escape the conclusion that something about personality is indeed “decontextualized.”

Consider, for example, these contexts: The first is an elementary school classroom on one of the Hawaiian Islands, in the mid-1960s. The second, 40 years later, is an interview room in a medical clinic at the Kaiser Permanente Center for Health Research in Honolulu, visited partway through a comprehensive, half-day health assessment. Would – could? – personality as observed and rated by teachers in the first context possibly be associated with behavior directly observed and recorded on video in the second? This question is the focus of the current study.

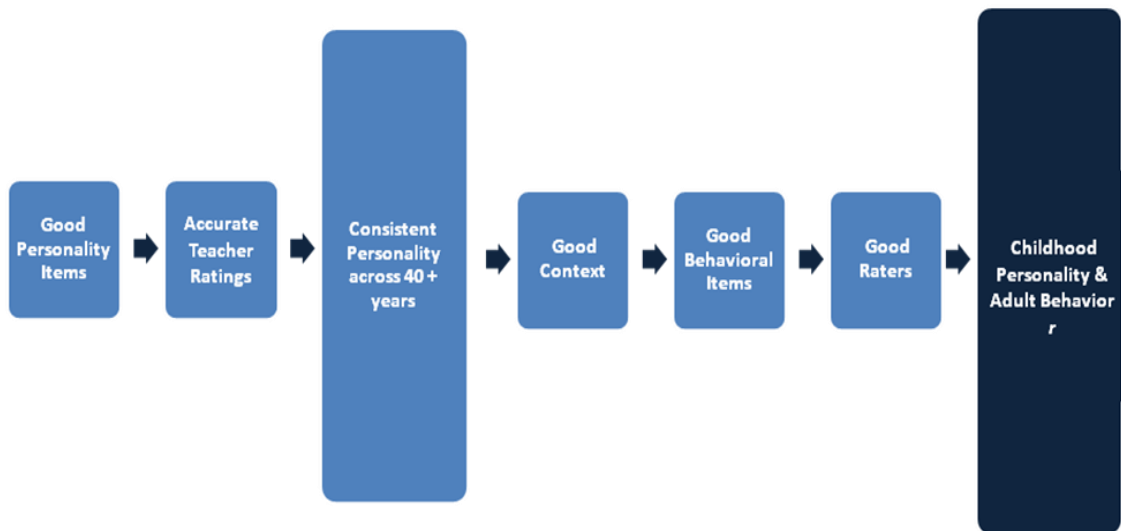
The current study is distinct from Hampson and Goldberg (2006) in that it uses ratings of adult behavior based on direct observation rather than self-reports of

personality. More generally, the current study differs from prior investigations just noted because it connects childhood ratings of personality to a broad set of behaviors directly observed in the same individuals as middle-aged adults, in a very different context after a long span of time. Specifically, it uses the Hawaii Personality and Health Cohort to associate personality ratings made by classroom teachers to behaviors directly observed in a personality interview conducted at a medical clinic over 40 years later.

Necessary Conditions for Detecting a Relationship between Personality and Behavior across Time

What would it take for this analysis to be successful? At least six difficult conditions are necessary (See Figure 1). First, researchers must develop good personality items that capture important aspects of personality that elementary school teachers can understand and observe. Second, teachers must provide accurate ratings based on their observations, successfully discriminating between their students on these dimensions of personality. Third, after a passage of time, research participants must be placed into a context that evokes behavior relevant to these dimensions. Fourth, researchers must develop good behavioral descriptors that raters can use to capture observable aspects of behavior that are relevant to personality.

Figure 1. Necessary Conditions for Demonstrating the Influence of Personality on Behavior across 40 Years.



Fifth, raters must be recruited and trained to be able to accurately rate these items on the basis of their viewing of the experimental video recording. The sixth and most important necessary condition is that the participants' underlying personality must remain stable, and continuously able to affect behavior across long periods of time and in diverse contexts.

Study 1

Methods

Participants

The original research cohort included six samples with a total of 2,404 elementary school children, recruited between the years 1959-1967, as part of a research project initiated by the late John Digman (1963, 1989). In July of 1998, nearly 40 years after

many of the school children originally participated in the study, the research staff at the Oregon Research Institute (ORI) attempted to locate as many of them as possible. Details of the recruitment procedures are summarized in Hampson and colleagues' (2001) paper, and the recruitment is ongoing. At the time the present analyses were performed, 453 participants had visited the Kaiser Permanente clinic in Honolulu and completed an extensive battery of medical, physical and cognitive measures as well as a semi-structured personality interview; of these, 240 agreed to have the interview video-recorded, and of these 221 had teacher ratings in the proper form to allow the present analyses (see below). One-hundred forty-four participants (68 female and 76 male) were selected from this group for intensive behavioral coding and analysis. The selection was random, except that we bypassed recordings that were of poor audio or visual quality, and all the interviews were conducted by either of two female interviewers who together accounted for the 78% of the total. The approximate ethnic breakdown of the participants (with the percentage in the whole sample in parentheses) was: 33% Japanese-American (37% in the whole sample), 16% European ancestry (18%), 14% native Hawaiian (21%), and 36% other or no response (24%).

The participants come from 3 of the original 6 child cohort samples described by Goldberg (2001).

Oahu: Grades 1 and 2 (N = 75). The total number of students in the original sample was 885. In 1965, 29 teachers from eight schools on the island of Oahu rated each of their students on 49 personality attributes. A single word or short phrase captured each

attribute along with a more detailed definition (e.g., *Spiteful*: deliberately does or says things which annoy or hurt others; says hateful things about others; belittles others).

Oahu: Grades 5 and 6 (N = 31). The total number of students in the original sample was 834. In 1965, 28 teachers from the same eight schools assessed each of their students using the same set of 49 personality attributes as in the Grades 1 and 2 sample.

Kauai: Grade 6 (N = 38). The total number of students in the original sample was 502. In 1967, 17 teachers from eight schools on the island of Kauai assessed each of their students using 43 personality attributes. Each attribute consisted of a single word or short phrase along with a more detailed definition; 39 of the personality attributes in the Kauai sample overlapped with the Oahu samples.

The current study examines the 39 personality attributes common to the ratings in all three samples. Three additional samples originally obtained from the Laboratory School of the University of Hawaii were not included because teachers provided ratings using a bipolar rather than a unipolar format.

Procedure: Teacher Ratings in 1965 or 1967.

Teachers were given names of their students along with sheets of paper each of which presented one personality attribute and its definition. Teachers sorted the students in their classes from highest to lowest on each attribute using a 9-step forced-choice quasi-normal distribution akin to a Q-sort distribution, except that individuals rather than items are sorted.

Procedure: Clinic Assessment in 2003-2008.

Participants who were successfully located and gave consent to participate attended a half-day session at the Kaiser Permanente clinic in Honolulu. They received an extensive battery of medical, physical, and cognitive assessments. In addition, participants were administered a semi-structured interview.

Interviews were conducted individually with one of two female staff members and, with consent, were video-recorded with the camera focused on the participant. Each interview began with a getting-acquainted period where the participant and staff member informally discussed various topics with the intent of making the participant feel at ease. Following this period, staff members followed the protocol of the Structured Interview for the Five Factor Model of Personality (SIFFM; Trull & Widiger, 1997). Although this structured interview somewhat constrains natural conversation between interviewers and participants, the participants were encouraged to elaborate on many of their responses and, in the process of doing so as well as during the initial, unstructured warm-up period, had an opportunity to exhibit a wide range of behaviors expressive of their personalities.

Procedure: Behavioral Coding in 2008-2009.

Copies of the recorded interviews were transported to the University of California, Riverside, where each of the 144 DVDs was viewed by four trained, undergraduate research assistants (from a total pool of 12 assistants). They were instructed to watch the entire interview and then to make behavioral ratings using the Riverside Behavioral Q-Sort version 3.0 (RBQ- 3.0: Funder, Furr & Colvin, 2000; Furr, Wagerman & Funder, 2010). The 67 items of the RBQ were sorted in a forced choice,

quasi-normal 9-step distribution ranging from most (9) to least (1) characteristic of the behaviors observed. Behavioral ratings were aggregated across the four raters to form a composite.

Measures

39 Common Personality Attributes. Thirty-nine personality attributes (Digman, 1963; Digman, 1989) were originally rated by all the teachers, in all of the samples, in 1965 or 1967. The attributes included descriptors of verbal fluency, adaptability, impulsivity, and tendencies to self-minimize. Each attribute was followed by a definition, developed from focus groups of teachers asked to give examples of relevant classroom behaviors.

Structured Interview for the Five Factor Model of Personality. The Structured Interview for the Five Factor Model of Personality (SIFFM; Trull & Widiger, 1997) has 120 items, and was designed for use in normal college and adult populations to capture the factors and facets of the Big Five traits of extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience². Sample items include: “Is it important for you to get what you want? IF YES: Have you exploited (taken advantage of) or conned somebody of something?”, and “Do you often speak or act without thinking it through first? IF YES: What kinds of problems has this caused?” One of two female interviewers administered the SIFFM to each participant in a room that was equipped with a video camera aimed at the participant. The length of time to complete the SIFFM

² Note that Goldberg (1990) refers to the fifth factor of the Big Five as Intellect/Imagination.

ranged from 22-84 minutes. The SIFFM can be scored on the dimensions of the Big Five but the current study instead used the verbal responses and behaviors that each participant exhibited during the interview only to make behavioral ratings with the Riverside Behavioral Q-sort.

Riverside Behavioral Q-Sort. The Riverside Behavioral Q-Sort-version 3.0 (RBQ-3.0: Funder, et al., 2000; Furr, et al., 2010), is a 67-item assessment tool designed to describe the range of a person's behavior. Items include: "speaks fluently; expresses ideas well", "initiates humor", and "tries to control the situation". The RBQ was written at a mid-level of analysis (Bakeman & Gottman, 1980; Mischel, 1973) to minimize subjective interpretation among raters yet still be psychologically meaningful in its content (Funder et al., 2000). As a result the RBQ includes both observable concrete behaviors (e.g., "smiles a lot") and more broad inferences of observable behavioral styles (e.g., "behaves in a competitive manner"). Ratings proceed by placing the 67 items, using the Q-sorting computer program developed in our lab³, into one of nine categories (1 = *extremely uncharacteristic*, 9 = *extremely characteristic*) each with a predetermined number of items, forming a forced choice, quasi-normal distribution.

The average item reliability—as computed from the intraclass correlation ICC (1, 4) (Shrout & Fleiss, 1979) among raters for each of the 67 RBQ items—for the composite RBQ scores was .66 (*SD* = .35).

³ The complete set of items and a free, downloadable copy of the sorting program are available at <http://rap.ucr.edu/qsorter/>.

Results

Because teachers rated each participant on 39 personality attributes and behavioral observers, 40 years later, rated 67 behaviors, 2613 (39 x 67) possible correlations could be computed. Out of 2613 possible correlations, 312 were significant at $p < .05$. According to the randomization procedure described by Sherman and Funder (2009), approximately 130 correlations would be expected to be significant at this level by chance, and the probability of the 312 actually attained was less than .001.⁴ In an effort to reduce this number of correlations, we examined the total number of behavioral correlates individually for each of the 39 common personality attributes. Of these, 11 attributes had a number of statistically significant correlates with behavioral items that greatly exceeded chance. In order to avoid redundancy, we selected 4 attributes (see Appendix A for the remaining 7 attributes not depicted in the tables below) that had relatively distinctive patterns of behavioral correlates (the vector correlations across the 67 behavioral correlates between the attributes was less than .80): *verbally fluent*, *adaptable*, *impulsive*, and *self-minimizing*.⁵ Vector correlations, which capture the degree to which one set of correlations is similar to a second set of correlations, were calculated

⁴ That is, in 1000 randomization runs, this number of significant correlates was never attained.

⁵ The average of the vector correlations between verbally fluent, adaptable, impulsive and self-minimizing was $r = .68$, range, $r = .51-.76$. The across-time correlates are reported across ethnic subgroups. The average sizes of the correlations within each subgroup (Japanese, Hawaiian, European and Other) were about the same or larger than the correlations for the sample as a whole, and the general patterns as indexed by vector correlations were also generally similar.

to assess whether similar patterns of correlates between the RBQ and teacher ratings of attributes existed when comparing the data by gender, by grade level (1st and 2nd graders compared to 5th and 6th graders), and by personality interviewer. The patterning of results presented below were found to be generally replicated across gender, grade, and interviewer.

Table 1 displays correlations between teachers' ratings of students' verbal fluency from 1965 or 1967 with behaviors coded in 2008 or 2009. *Verbally fluent* was defined for the teachers who rated this attribute rather differently from its perhaps more conventional conceptualization as verbal intelligence. Instead, it was defined as "speech seems to 'pour out', often in a torrent of words, sometimes making it difficult to understand him (her)." Of the 67 RBQ items, 26 were significantly correlated at the $p < .05$ level with this attribute. The probability of finding this many correlations by chance, according to a randomization procedure (see Sherman & Funder, 2009) across 10,000 trials is $p = .0003$. Elementary school children rated by their teachers as high in verbal fluency tended, as middle-aged adults, to display interest in intellectual matters, speak fluently, try to control the situation, and exhibit a high degree of intelligence. Children rated low in verbal fluency by their teachers were observed, as middle-aged adults, to seek advice, give up when faced with obstacles, and exhibit an awkward interpersonal style.

Table 1. Teacher's ratings of *Verbal Fluency* in 1965 or 1967 correlated with direct observations of behavior in 2003-2008.

## - RBQ Item	<i>r</i>
<u>Positive</u>	<u>N = 144</u>
41 – Shows interest in intellectual/cognitive matters	.30***
53 – Speaks fluently; Expresses ideas well	.28***
04 – Tries to control situation	.25**
23 – Exhibits high degree of intelligence	.25**
45 – Displays ambition	.24**
05 – Dominates situation	.23**
07 – Exhibits social skills	.21*
57 – Speaks sarcastically	.21*
55 – Behaves in competitive manner	.20*
56 – Speaks in a loud voice	.19*
27 – Exhibits condescending behavior	.18*
<u>Negative</u>	
29 – Seeks advice	-.26**
13 – Exhibits awkward interpersonal style	-.23**
50 – Gives up when faced w/obstacles	-.22**
24 – Expresses sympathy	-.21*
21 – Expresses insecurity	-.20*
18 – Expresses agreement frequently	-.20*

66 – Acts in self-indulgent manner	-.20*
44 – Says negative things about self	-.19*
67 – Exhibits physical discomfort/pain	-.19*
36 – Behaves in fearful or timid manner	-.19*
60 – Seems detached from situation	-.18*
22 – Physical signs of tension/anxiety	-.17*
48 – Expresses sexual interest	-.17*
65 – Engages in physical activity	-.17*
<u>26 – Seeks reassurance</u>	<u>-.17*</u>

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Verbal Fluency* was defined as: speech seems to “pour out,” often in a torrent of words, sometimes making it difficult to understand him (her). Probability of this many correlates significant by chance (10,000 trials), $p = .0003$. Vector correlation by gender, $r = .66$. Vector correlation by grade, $r = .48$. Vector correlation by interviewer, $r = .60$.

Table 2 displays correlates between teacher’s ratings of children’s *adaptability* from 1965 or 1967 with behavioral codings obtained from 2008-2009. Adaptable was defined as “copes easily and successfully with new and strange situations; bravely faces up to uncertainty”. Of the 67 RBQ items, 20 were significantly correlated at the $p < .05$ level. The probability of finding this many significant correlations, according to a randomization procedure across 10,000 trials, is $p = .0022$. Elementary school children rated by their school teachers as highly adaptable tended, as middle-aged adults, to display behaviors such as behaving in a cheerful manner, speaking fluently, and showing

interest in intellectual matters. Children rated as low in adaptability were observed, as adults, to say negative things about themselves, seek advice, and exhibit an awkward interpersonal style.

Table 2. Teacher's ratings of *Adaptable* in 1965 or 1967 correlated with direct observations of behavior in 2003-2008.

<u>## - RBQ Item</u>	<u><i>r</i></u>
<u>Positive</u>	<u>N = 144</u>
49 – Behaves in cheerful manner	.28***
53 – Speaks fluently; Expresses ideas well	.23**
41 – Shows interest in intellectual/cognitive matters	.23**
07 – Exhibits social skills	.22**
63 – Other(s) seek advice from P	.22**
42 – Seems to enjoy situation	.20*
23 – Exhibits high degree of intelligence	.19*
55 – Behaves in competitive manner	.19*
05 – Dominates situation	.18*
04 – Tries to control situation	.18*
<u>Negative</u>	
44 – Says negative things about self	-.24***
29 – Seeks advice	-.24***
13 – Exhibits awkward interpersonal style	-.24***

26 – Seeks reassurance	-.21*
21 – Expresses insecurity	-.20*
60 – Seems detached from situation	-.19*
35 – Unusual or unconventional appearance	-.19*
67 – Exhibits physical discomfort/pain	-.19*
22 – Physical signs of tension/anxiety	-.19*
47 – Expresses self-pity or victimization	-.16*

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Adaptable* was defined as: copes easily and successfully with new and strange situations; bravely faces up to uncertainty. Probability of this many correlates significant by chance (10,000 trials), $p = .0022$. Vector correlation by gender, $r = .46$. Vector correlation by grade, $r = .32$. Vector correlation by interviewer, $r = .42$.

Table 3 displays correlates between teacher's ratings of children's *impulsivity* from 1965 or 1967 with behavioral codings from 2008-2009. Impulsive was defined as "behavior always seems very 'close to the surface'; often acts before the appropriate moment; finds it difficult to hold back; often acts or speaks without thinking of possible consequences." Of the 67 RBQ items, 19 were significantly correlated at the $p < .05$ level with this attribute. The probability of finding this many significant correlations, according to a randomization procedure across 10,000 trials, is $p = .0018$. Elementary school children rated by their school teachers as highly impulsive were observed, as middle-aged adults, to speak in a loud voice, display a wide range of interests and be

talkative. Children rated as low on impulsivity were observed, as adults, to behave in a fearful or timid manner, keep others at a distance and express insecurity.

Table 3. Teacher's ratings of *Impulsive* in 1965 or 1967 correlated with direct observations of behavior in 2003-2008.

<u>## - RBQ Item</u>	<u>r</u>
<u>Positive</u>	<u>N = 144</u>
56 – Speaks in a loud voice	.28***
16 – Displays wide range of interests	.25***
20 – Is talkative	.24***
15 – High enthusiasm and energy level	.22**
02 – Volunteers Information about Self	.21*
05 – Dominates situation	.21*
45 – Displays ambition	.21*
54 – Emphasizes accomplishments	.21*
04 – Tries to control situation	.20*
43 – Says/does something interesting	.19*
07 – Exhibits social skills	.17*
<u>Negative</u>	
36 – Behaves in fearful or timid manner	-.26***
40 – Keeps other(s) at a distance	-.20*
21 – Expresses insecurity	-.19*

50 – Gives up when faced w/obstacles	-.18*
44 – Says negative things about self	-.17*
39 – Expresses guilt	-.17*
18 – Expresses agreement frequently	-.17*
60 – Seems detached from situation	-.17*

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Impulsive* was defined as: behavior always seems very “close to the surface”; often acts before the appropriate moment; finds it difficult to hold back; often acts or speaks without thinking of possible consequences. Probability of this many correlates significant by chance (10,000 trials), $p = .0018$. Vector correlation by gender, $r = .43$. Vector correlation by grade, $r = .54$. Vector correlation by interviewer, $r = .37$.

Table 4 displays correlates between teacher’s ratings of children’s tendency to *self-minimize* from 1965 or 1967 with behavioral codings from 2008-2009. Self-minimizing was defined as “tends to minimize own importance; humble; never brags or shows off; seeks out or is content with less important tasks or positions.” Of the 67 RBQ items, 11 were significantly correlated at the $p < .05$ level with this attribute. The probability of finding this many significant correlations by chance, according to a randomization procedure across 10,000 trials, is $p = .0373$. Elementary school children rated by their school teachers as high in self-minimizing were observed, as middle-aged adults, to express guilt, seek reassurance, say negative things about themselves, and express insecurity. Children rated as low in self-minimizing were observed, as adults, to

speak in a loud voice, show interest in intellectual matters and exhibit condescending behavior.

Table 4. Teacher's ratings of *Self-Minimizing* in 1965 or 1967 correlated with direct observations of behavior in 2003-2008.

<u>## - RBQ Item</u>	<u><i>r</i></u>
<u>Positive</u>	<u>N = 144</u>
39 – Expresses guilt	.28***
26 – Seeks reassurance	.22**
44 – Says negative things about self	.20*
21 – Expresses insecurity	.20*
47 – Expresses self-pity or victimization	.18*
<u>Negative</u>	
56 – Speaks in a loud voice	-.20*
41 – Interest in intellectual/cognitive matters	-.19*
27 – Exhibits condescending behavior	-.19*
45 – Displays ambition	-.19*
15 – High enthusiasm and energy level	-.18*
<u>53 – Speaks fluently; Expresses ideas well</u>	<u>-.18*</u>

Note. ***p < .001, **p < .01, *p < .05. *Self-minimizing* was defined as: tends to minimize own importance; humble; never brags or shows off; seeks out or is content with less important tasks or positions.

Probability of this many correlates significant by chance (10,000 trials), $p = .0373$.

Vector correlation by gender, $r = .52$. Vector correlation by grade, $r = .38$. Vector correlation by interviewer, $r = .45$.

Discussion

For ratings of personality made by elementary school teachers to be shown to have meaningful associations with behavior decades later, several difficult conditions had to be fulfilled. Useful and clear personality items for the teachers to rate had to be written, the teachers had to make accurate observations of their students and rate the items correctly, good items for describing behavior had to be developed, an observational context had to be constructed in which behavior relevant to behavior would be manifested, and raters had to be trained to observe and accurately code behavior using these items. Most crucially, the attributes of personality assessed by teachers in the elementary school years had to continue to exert an influence on behavior in a very different context 40 years later.

Seen in this light, the findings obtained by the present study are impressive. Among other correlates, children rated as “verbally fluent” (under instructions that define the term as referring to unrestrained talkativeness) displayed dominant and socially adept behavior as middle-aged adults. Early “adaptability” was associated with cheerful and intellectually curious behavior. Early “impulsivity” was associated with later talkativeness and loud speech.

Early rated tendencies to “self minimize” were associated with adult expressions of insecurity and humility. This study convincingly demonstrates that child personality can predict numerous directly observed behaviors across different contexts and across time.

Chapter 3: Adult Personality

Predicts Directly Observed Behavior Years Later

Study 1 examined behavioral manifestations of childhood personality, Study 2 attempts to further examine the relationship between personality and a diverse set of behaviors. Unlike Study 1, adults provided self-ratings of personality and these personality ratings were related to directly observed behaviors encountered in the same personality interview from Study 1. In addition, Study 2 uses one of the most popular indices of personality, the Big Five, made up of extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. Much like Study 1, several important conditions have to be met in order for a relationship to be found between personality and behavior. Good personality items, in this case, the Big 5, had to be administered to participants. Then, participants had to provide accurate ratings of their personality. Next, a good context had to exist to allow for the display of a variety of behaviors that were made available to observers. In this case, the context was the same as in Study 1: a personality interview administered in a clinic at Kaiser Permanente clinic in Honolulu. Good behavioral items had to be used in order to capture the variety of behaviors that participants were displaying in the personality interview. As in Study 1, the Riverside Behavioral Q-Sort (RBQ-3.0: Funder, Furr & Colvin; Furr, Wagerman & Funder, 2010) was used. Good raters (the same ones used in Study 1) had to correctly document the types of behaviors in the personality interview and each of the raters had to agree with one another at a high level. Finally, for any kind of meaningful association between personality and behavior, participants' personality had to remain consistent in

the 2-9 year gap in which their self-rated personality was related to directly observed behavior in the personality interview. All of these somewhat daunting conditions have to be met in order to find associations between the Big Five personality traits and behavior.

Study 2

Method

Participants

Participants for Study 2 came from the same initial sample of 2,404 elementary school children that were recruited in the years 1959-1967. Between 1999-2001, 1,314 participants from the initial sample (approximately 55%) provided self-reported ratings of health and personality in a paper and pencil format submitted via mail. As in Study 1, at the time the present analyses were performed, 453 participants had visited the Kaiser Permanente clinic in Honolulu and completed an extensive battery of medical, physical, and cognitive measures as well as a semi-structured interview; of these, 240 agreed to have the interview video-recorded. One-hundred fifty-five participants (77 female, 78 male) were selected from this group for intensive behavioral coding and analysis. As in Study 1, the selection was random. The interviews were conducted by either of two female investigators who accounted for 78% of the total. The approximate ethnic breakdown of the participants in this subsample was: 36% Japanese-American, 18% European ancestry, 14% native Hawaiian, and 31% other or no response. Note that the ethnicity breakdown for the whole sample was identical to the numbers presented in Study 1.

Procedure: Self Ratings of Personality between 1999-2001.

Participants were mailed a 16-page survey that included questions about personality, behavior, health, and demographics. Among the items was the 44-item in the Big Five Inventory (BFI; John & Srivastava, 1999). Participants rated their personality on each of the 44-items using a 5-point Likert rating scale where 1 = disagree strongly and 5 = agree strongly. After completing the BFI and the other surveys included in the 16-page packet, participants mailed the surveys back to the Oregon Research Institute (ORI) in Eugene, Oregon. All of the participants in the current study completed and mailed back survey packets between 1999-2001.

Procedure: Clinic Assessment in 2003-2008.

The same procedures from Study 1 were employed in Study 2.

Procedure: Behavioral Coding in 2008-2009.

The same procedures from Study 1 were employed in Study 2. The same raters were used for both studies so the aggregated composite ratings are identical to those in Study 1.

Measures

Big Five Inventory. The Big Five Inventory (BFI: John & Srivastava, 1999) consists of 44 items that assess the global personality traits of extraversion, agreeableness, conscientiousness, neuroticism, and openness. Each item is rated on a five-point Likert scale (1 = *disagree strongly*, 5 = *agree strongly*) using a paper format. The alpha reliabilities of the five composites were as follows: extraversion = .84, agreeableness = .79, conscientiousness = .80, neuroticism = .82, and openness = .81.

In addition to the measure of personality, the BFI, the same measure of behavior, the RBQ 3.0 and the same semi-structured interview, the SIFFM, from Study 1 were used. Note that the composite RBQ scores are identical from Study 1.

Results

As in Study 1, vector correlations were computed to assess whether similar patterns of correlates between self-ratings of personality and the RBQ existed when comparing the data by gender, and by personality interviewer. As in Study 1, the patterning of results presented below were found to be generally replicated across gender and interviewer.

Table 5 displays correlations between self-ratings of extraversion from 1999-2001 with behaviors as coded from interviews recorded between 2003-2008. Of the 67 RBQ items, 30 were significantly correlated at the $p < .05$ level with this attribute. The probability of finding this many correlations by chance, across 10,000 trials is $p = .0002$. Adults who rated themselves high in extraversion tended to, 2-9 years later, display high enthusiasm and energy level, speak in a loud voice, be talkative, and try to control the situation. Adults who rated themselves low in extraversion tended to behave in a fearful or timid manner, give up when faced with obstacles, keep others at a distance and be reserved and unexpressive.

Table 5. Self-ratings of BFI Extraversion in 1999-2001 correlated with direct observations of behavior in 2003-2008.

## - RBQ Item	Combined <u>N =155</u>
<u>Positive</u>	
15 – High enthusiasm and energy level	.42***
56 – Speaks in a loud voice	.39***
20 – Is talkative	.35***
04 – Tries to control situation	.31***
05 – Dominates situation	.31***
45 – Displays ambition	.30***
07 – Exhibits social skills	.28***
02 – Volunteers Information about Self	.27***
11 – Physically animated; Moves a lot	.25**
16 – Displays wide range of interests	.25**
55 – Behaves in competitive manner	.24**
43 – Says/does something interesting	.22**
37 – Expressive in voice, face, or gesture	.21*
54 – Emphasizes accomplishments	.20*
25 – Initiates humor	.17*

Negative

36 – Behaves in fearful or timid manner	-.48***
50 – Gives up when faced w/obstacles	-.42***
40 – Keeps other(s) at a distance	-.38***
08 – Reserved and unexpressive	-.37***
21 – Expresses insecurity	-.37***
13 – Exhibits awkward interpersonal style	-.34***
44 – Says negative things about self	-.29***
60 – Seems detached from situation	-.24**
47 – Expresses self-pity or victimization	-.23**
29 – Seeks advice	-.22**
18 – Expresses agreement frequently	-.21*
39 – Expresses guilt	-.20*
67 – Exhibits physical discomfort/pain	-.20*
22 – Physical signs of tension/anxiety	-.19*
28 – Seems likeable	-.17*

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. Probability of this many correlates significant by chance (10,000 trials), $p = .0002$. Vector correlation by gender, $r = .69$. Vector correlation by interviewer, $r = .62$.

Table 6 displays correlates between self-ratings of agreeableness from 1999-2001 with behavioral codings from 2008-2009. Of the 67 RBQ items, 18 were significantly

correlated at the $p < .05$ level. The probability of finding this many significant correlations, according to randomization procedures across 10,000 trials, is $p = .0022$.

Adults who rated themselves as high in agreeableness tended to 2-9 years later, to behave in a cheerful manner, exude high enthusiasm and energy level, express sympathy, and express warmth. Adults who rated themselves as low in agreeableness tended to 2-9 years later, to keep other(s) at a distance, express criticism, act irritated, and try to undermine/sabotage.

Table 6. Self-ratings of BFI Agreeableness in 1999-2001 correlated with direct observations of behavior in 2003-2008.

<u>## - RBQ Item</u>	<u>Combined</u>
	<u>N =155</u>
<u>Positive</u>	
49 – Behaves in cheerful manner	.31***
15 – High enthusiasm and energy level	.28***
24 – Expresses sympathy	.27***
32 – Expresses warmth	.27***
62 – Acts playful	.23**
37 – Expressive in voice, face, or gesture	.21*
20 – Is talkative	.20*
07 – Exhibits social skills	.19*

Negative

40 – Keeps other(s) at a distance	-.33***
19 – Expresses criticism	-.29***
31 – Acts irritated	-.28***
33 – Tries to undermine/sabotage	-.25**
34 – Expresses hostility	-.25**
22 – Physical signs of tension/anxiety	-.20*
08 – Reserved and unexpressive	-.20*
13 – Exhibits awkward interpersonal style	-.18*
14 – Compares self to other(s)	-.18*
<u>27 – Exhibits condescending behavior</u>	<u>-.17*</u>

Note: *** $p < .001$; ** $p < .01$; * $p < .05$. Probability of this many correlates significant by chance (10,000 trials), $p = .0022$. Vector correlation by gender, $r = .58$. Vector correlation by interviewer, $r = .52$.

Table 7 displays correlates between self-ratings of conscientiousness from 1999-2001 with behavioral codings from 2008-2009. Of the 67 RBQ items, 10 were significantly correlated at the $p < .05$ level. The probability of finding this many significant correlations, according to randomization procedures across 10,000 trials, is $p = .0388$. Adults who rated themselves as high in conscientiousness tended to 2-9 years later, to speak fluently and express ideas well, exhibit condescending behavior and behave in a competitive manner. Adults who rated themselves as low in

conscientiousness tended, 2-9 years later, say negative things about self, seek advice, express guilt, and make or approach physical contact.

Table 7. Self-ratings of BFI Conscientiousness in 1999-2001 correlated with direct observations of behavior in 2003-2008.

<u>## - RBQ Item</u>	<u>Combined</u>
	<u>N =155</u>
<u>Positive</u>	
53 – Speaks fluently; Expresses ideas well	.28***
27 – Exhibits condescending behavior	.23**
55 – Behaves in competitive manner	.21*
<u>Negative</u>	
44 – Says negative things about self	-.30***
29 – Seeks advice	-.29***
39 – Expresses guilt	-.23**
58 – Makes/approaches physical contact	-.22**
22 – Physical signs of tension/anxiety	-.20*
47 – Expresses self-pity or victimization	-.18*
<u>21 – Expresses insecurity</u>	<u>-.17*</u>

Note: *** $p < .001$; ** $p < .01$; * $p < .05$. Probability of this many correlates significant by chance (10,000 trials), $p = .0388$. Vector correlation by gender, $r = .57$. Vector correlation by interviewer, $r = .48$.

Table 8 displays correlates between self-ratings of neuroticism from 1999-2001 with behavioral codings from 2008-2009. Of the 67 RBQ items, 14 were significantly correlated at the $p < .05$ level. The probability of finding this many significant correlations, according to randomization procedures across 10,000 trials, is $p = .0035$. Adults who rated themselves as high in neuroticism tended, 2-9 years later, to express insecurity, say negative things about self, express guilt, and express self-pity or victimization. Adults who rated themselves as low in neuroticism tended, 2-9 years later, to display ambition, behave in a cheerful manner, seem to enjoy the situation and concentrate and work hard at task.

Table 8. Self-ratings of BFI Neuroticism in 1999-2001 correlated with direct observations of behavior in 2003-2008.

<u>## - RBQ Item</u>	<u>Combined</u>
	<u>N =155</u>
<u>Positive</u>	
21 – Expresses insecurity	.33***
44 – Says negative things about self	.31***
39 – Expresses guilt	.30***
47 – Expresses self-pity or victimization	.28***
34 – Expresses hostility	.27***
19 – Expresses criticism	.18*
46 – Blames others	.18*

31 – Acts irritated .17*

Negative

45 – Displays ambition -.21*

49 – Behaves in cheerful manner -.21*

42 – Seems to enjoy situation -.19*

64 – Concentrates; Work hard at task -.19*

15 – High enthusiasm and energy level -.18*

41 – Interest in intellectual/cognitive matters -.17*

Note: *** $p < .001$; ** $p < .01$; * $p < .05$. Probability of this many correlates significant by chance (10,000 trials), $p = .0035$. Vector correlation by gender, $r = .49$. Vector correlation by grade, $r = .54$. Vector correlation by interviewer, $r = .50$.

Table 9 displays correlates between self-ratings of openness to experience from 1999-2001 with behavioral codings from 2008-2009. Of the 67 RBQ items, 20 were significantly correlated at the $p < .05$ level. The probability of finding this many significant correlations, according to randomization procedures across 10,000 trials, is $p = .0024$. Adults who rated themselves as high in openness tended, 2-9 years later, express interest in intellectual and cognitive matters, display a wide range of interests, dominate the situation, and display ambition. Adults who rated themselves as low in openness tended, 2-9 years later, behave in a fearful or timid manner, express agreement frequently, give up when faced with obstacles, and exhibit an awkward interpersonal style.

Table 9. Self-ratings of BFI Openness in 1999-2001 correlated with direct observations of behavior in 2003-2008.

## - RBQ Item	Combined <u>N = 155</u>
<u>Positive</u>	
41 – Interest in intellectual/cognitive matters	.31***
16 – Displays wide range of interests	.28***
05 – Dominates situation	.26**
45 – Displays ambition	.24**
23 – Exhibits high degree of intelligence	.23**
04 – Tries to control situation	.21*
53 – Speaks fluently; Expresses ideas well	.18*
15 – High enthusiasm and energy level	.17*
34 – Expresses hostility	.17*
<u>Negative</u>	
36 – Behaves in fearful or timid manner	-.26**
18 – Expresses agreement frequently	-.25**
50 – Gives up when faced w/obstacles	-.21*
13 – Exhibits awkward interpersonal style	-.20*
44 – Says negative things about self	-.20*
21 – Expresses insecurity	-.19*
51 – Behaves in stereotypical gender style or manner	-.18*

08 – Reserved and unexpressive	-.17*
12 – Seems to like other(s)	-.17*
22 – Physical signs of tension/anxiety	-.17*
<u>61 – Speaks quickly</u>	<u>-.17*</u>

Note: *** $p < .001$; ** $p < .01$; * $p < .05$. Probability of this many correlates significant by chance (10,000 trials), $p = .0024$. Vector correlation by gender, $r = .56$. Vector correlation by interviewer, $r = .52$.

A different way to examine how personality manifests itself in behavior is to conduct simultaneous regressions where the Big 5 is predicting each of the 67 behaviors in the RBQ (See Appendix B). For each RBQ item, standardized betas are presented according to the highest beta associated with one particular personality factor. Note that the pattern is largely similar to the pattern obtained in the correlate tables listed above.

Discussion

Study 2 elucidates the relationship between the most widely used personality psychological variables, the Big Five, with directly observed behavior witnessed between two to nine years later. All five personality traits were associated with a wide variety of directly observed behaviors. Extraverted individuals tended to, 2-9 years later, display sociable behaviors. Agreeable individuals tended to, 2-9 years later, express warm, positive, socially-connected behaviors. Conscientious individuals tended to, 2-9 years later, speak fluently, exhibit condescending behavior, and behave in a competitive

manner. Neurotic individuals tended to, 2-9 years later, express a variety of negative, insecure behaviors. Finally, individuals high in Openness to Experience tended to, 2-9 years later, express a wide variety of interest as well as elicit an interest in intellectual and cognitive matters. The relationship between personality and behavior remained highly similar whether correlational or simultaneous regression analyses were employed.

Chapter 4: General Discussion and Conclusion

An accumulating body of research demonstrates the remarkable stability of personality across the lifespan. The stability of personality is a necessary criterion for being able to predict outcomes of consequence. An impressive literature exists demonstrating that personality does indeed predict important life outcomes whether in academic domains, interpersonal domains, institutional domains, health domains, and even in our own mortality. An understudied area within personality psychology, however, is the connection between personality and a diverse set of directly observed behaviors witnessed in a different context. The current work expands on our understanding of personality and its relationship with behavior by a) connecting childhood ratings of personality by school-teachers with directly observed behavior in two very different contexts over four decades later and b) connecting adult self-ratings of personality to directly observed behavior 2-9 years later.

The present study is distinctive from much psychological research in that it examines individual differences in personality within a fairly large, ethnically diverse sample of adults – not the more usual small and relatively homogenous sample of college students. Even more distinctively, it employs direct observations of video-recorded behavior rather than just self-report measures or distal outcomes and assesses the continuity of personality's association with behavior across a period of more than four decades.

Mechanisms Behind Personality Stability

The radical contextual perspective (Caspi & Roberts, 2001; Caspi, Roberts, & Shiner, 2005) characterizes traits as highly changeable and susceptible to environmental influences. Based on work by Ferguson (2010) and many others, it is unlikely that this perspective accurately characterizes how stable personality traits are across time. Two additional perspectives also try to account for the degree of personality stability across the lifespan: the biological essentialist perspective (Caspi et al., 2005), and the compromise perspective (Ferguson, 2010). The biological essentialist perspective characterizes personality stability as biological in nature, highly stable, large, and universal in nature. This perspective primarily stemmed from a review of studies which provided evidence that personality was “set like plaster” by age 30 (Costa & McCrae, 1994) and from the Five-Factor Theory (McCrae & Costa, 1996) that asserts that the Big Five personality traits are solely biologically determined. Personality change is possible up until age 30 but not beyond because one has reached maturity by that point. One major analysis of the biological essentialist perspective tested the idea that personality does not change after age 30, labeled “hard plaster”, compared to the hypothesis that personality change slows after age 30, labeled “soft plaster” (Srivastava et al., 2003). Researchers did not find any evidence for the hard plaster hypothesis and only limited support for the soft plaster hypothesis, thereby concluding that non-biological factors must also explain personality change (Srivastava et al., 2003).

The compromise perspective acknowledges that genes influence individual differences among personality trait levels (e.g., Loehlin, McCrae, Costa, & John, 1998),

but also suggests moderate personality stability and that environmental influences also play a large role and temper the degree of personality stability across time (e.g. Roberts & Mroczek, 2008). In a review of cross-sectional and longitudinal studies, personality was found to change throughout the lifespan, with some traits (e.g., conscientiousness, agreeableness, social dominance, emotional stability) showing mean-level increases in people well past age 30 (Roberts & Mroczek, 2008). If we choose to characterize the personality stability coefficients as moderate, it leaves us asking a fundamental question: What is the basis of this continuity?

Caspi (1998, 2000) has suggested that temperamental attributes that are inherited via our genes, with frequent reinforcement, become a part of our cognitive representation that is easily primed and accessible. In addition, biological attributes and environmental influences interact with one another in the form of various person-environment transactions. One such transaction, evocative transactions, involves a person obtaining distinct responses from people around them. A second transaction, proactive transactions, is when a person actively seeks out a particular environment or creates a particular environment to fulfill their needs. A third transaction, reactive transactions involve an individual perceiving the same environment as everyone else, yet they interpret and react to the environmental stimuli differently from others (Scarr & McCartney, 1983).

Transactions like these are thought to create patterns of behavioral responses that are related to a person's underlying personality. The manner in which these patterns form may be through accumulation, which is the build-up over time of a person's exposure to environmental factors as well as the strengthening of particular response patterns by the

individual and the people that surround an individual with respect to their personality traits (Hampson, 2008). Caspi (2000) and others (e.g., Block & Block, 2006; Hampson, 2008) are quick to point out that continuity of personality does not rule out the ability to change one's personality through active change, interventions, and natural, unplanned (e.g., chance encounters, tragedies, accidents), or planned environment change (e.g., moving, changing social status). An important qualification is that the way a person perceives the events listed above are in fact filtered by our personality, suggesting that any change that may occur would be modest.

Considerable evidence also highlights the “power of personality” and relates personality to important life outcomes. With the establishment of personality being stable and an important predictor of outcomes of interest, researchers need to focus on underlying mechanisms by which personality has long-lasting effects on future behavior and life outcomes. In attempting to investigate mechanisms associated with personality and outcomes Hampson (2008) suggested multiple pathways and for each pathway, multiple mediators that account for why a childhood trait relates to an adult outcome. The mechanisms that explain why childhood traits relate to adult outcomes may be largely automatic, emotional, deliberate, or reflective (Hampson, 2008).

The next step in understanding personality and its relationship with behavior is to take a deeper look at underlying mechanisms, which currently in our field, is largely understudied (Hampson, 2008). There has been, however, an increased emergence of looking at mediation to explain how personality relates to a particular behavior or life outcome. Mediation can be thought of as a “bridge” between child or adult personality

and a particular behavior or outcome of interest (Hampson, 2008). If we take a powerful association, in this case obtained from the Terman sample, where childhood conscientiousness predicts longevity (Friedman et al., 1995), we should try to understand why this association exists. Research has suggested that health behaviors such as lifetime cigarette use and other health behaviors may serve a mediating role in connecting childhood personality with behavior (Friedman et al., 1995; Friedman, 2000). Although research has not directly examined the mediating role that particular health behaviors have on child conscientiousness using a prospective design, a meta-analysis suggests that conscientious people are less likely to engage in unsafe or unhealthy activities like drug use, unprotected sex, or getting into fights (Bogg & Roberts, 2004). In turn, these behaviors likely mediate the relationship between conscientiousness and mortality.

A research study that was able to directly test mediation examined conscientiousness obtained from elementary school children with self-reported health in a 40-year follow-up study. It was found that children low in conscientiousness tend to smoke more as adults. Increased smoking predicted poorer adult self-rated health and partially mediated the relationship between child conscientiousness and adult self-rated health (Hampson, Golberg, Vogt, & Dubanoski, 2006). Other pathways, such as those previously discussed by Caspi (1998, 2000) also likely explain how a personality trait like conscientiousness influences health behaviors which in turn predicts important outcomes such as one's mortality.

Another area of mediation research focuses on self-regulatory mechanisms as possible pathways between personality and outcomes and behaviors. Examples of

constructs and behaviors that relate to self-regulatory mechanisms used in research to connect personality and behavior include educational attainment, delay of gratification, ego resiliency, drinking in moderation, and cigarette use across the lifespan (Block & Block, 2006; Hampson, 2008).

We now have a much better understanding of how remarkably stable personality is across the life-span. We also know the “power of personality” in that personality predicts various important outcomes and behaviors of consequence across the life-span. Researchers in developmental, personality, and health psychology in particular need to examine the complex nature in which personality and outcomes and behaviors are related. A deeper and broader understanding of the behavioral manifestations of personality traits is one approach. Although the types of behaviors may change within a person’s life, the underlying psychological properties associated with the behaviors are thought to be preserved across time (Block, 2008; Caspi, 2000). For example, a conscientious child may decide not to cheat on an elementary school test, or to cut in line at recess while as an adult they may arrive early to a job interview and decide not to drive with someone who had been drinking. The preserved qualities of behavior, particularly across time and contexts are thought to reflect coherence, that “refers to a pattern of findings where a construct, measured by several different methods, retains its psychological meaning as revealed in relationships to a variety of other measures” (Ozer, 1986, p. 83, as referenced in Caspi, 2000). Examining mediators and mechanisms of these behavioral manifestations of personality is also important. With increased

examination of these areas it should be possible to begin to accumulate evidence that helps explain *why* personality relates to outcomes across the life-span (Hampson, 2008).

Future Research

Longitudinal studies that obtain multiple measurements from multiple methodologies are essential to psychological research, particularly with respect to understanding the underlying mechanisms behind personality stability and how personality predicts behavior and important life outcomes across time and across diverse situations. The use of multiple measurements allows for the utilization of advanced statistical techniques that are more sensitive to analyzing change and the various trajectories (e.g., growth trajectories) that may exist across the life-span (Hampson, 2008). Future research needs to devote more attention to studying the connection between personality and behavior, particularly in longitudinal studies that employ strong behavioral methodology and survey a wide range of behaviors (Furr, 2009). Behavior can be viewed as an explanatory mechanism for personality traits. A renewed, dedicated focus on a wide variety of behaviors may help us understand that very important question in psychology: *why*? Why does personality predict various important outcomes of interest? What is it about behavior that may cause this relationship to occur?

I will continue in this line of longitudinal behavioral research both using data from the ongoing Hawaii Personality and Health Cohort study as well as seeking external funding to examine this question in other datasets. Specifically, I will continue to examine understudied questions such as the underlying process by which personality

predicts behavior, the extent to which our personality traits are stable, and the extent to which interventions can alter behavior. I also have an interest in the intersection between personality, health and behavior and will investigate the relationship between personality, directly observed behavior, and important health outcomes. The Hawaii Personality and Health Cohort is an on-going project designed to follow roughly 1,800 participants through their mortality. Studies 1 and 2 used a subsample of approximately 150 participants. Future research will include a much larger subsample in the attempts to replicate findings from previous studies as well as to examine any possible moderators for the relationship we find between personality and behavior. A larger, multi-wave dataset will allow not only for the examination of possible ethnic, gender, and age differences, but we can get a better account for trajectories of personality and of behavior.

An immediate project that I plan on conducting involves using the same subsample of approximately 150 participants. After the participants were videotaped in a semi-structured personality interview, participants were tested and evaluated using the Woodcock Johnson cognitive abilities test (Woodcock, Mather, & McGrew, 2001). The Woodcock Johnson assesses 10 different cognitive abilities such as visual-spatial thinking, fluid reasoning, processing speed, reading-writing ability, as well as provides a general intellectual ability or brief intellectual ability score. Participants were videotaped being administered the Woodcock Johnson which allows for the ability to code for behaviors exhibited during the process. As a result, I plan on connecting directly observed behaviors witnessed during a cognitive abilities test with performance on the cognitive abilities measures, personality, and with health outcomes (e.g., subjective

physical and mental health, blood pressure, heart rate, medical history, future disease). Yet another plan for future research is to take the videotaped recordings of the semi-structured personality interview and the cognitive abilities test and assess non-verbal behaviors and word-usage in an attempt to connect how these relate to behavior, personality, and health.

Finally, a long-term plan that I intend to study involves investigating the degree of motivation that people have with respect to changing particular personality traits or particular behaviors (health or non-health) and how motivation to change may influence health and well-being outcomes across the life-span. Similarly, I could look at motivated consistency and stability, which is the extent a person strives to maintain their current health and social behaviors, whether they are actually successful at staying consistent (or in being able to change if they want to change), and how that relates to various health outcomes. The self-help industry is a multi-billion dollar industry dedicated to helping people change their behavior or personality, yet researchers are only beginning to know about the degree of long-term success people have in altering behavior and the field of personality psychology knows even less about motivated personality change and its relationship to long-term social and health outcomes.

Conclusion

Findings from Studies 1 and 2 return us to the question that began this article. What is the basis of this continuity? It seems unlikely that these kinds of connections between early personality and much later behavior are importantly due to anything

concerning the overlap of situations or context. Rather, it is difficult to avoid the conclusion that these results, along with others already in the literature, show that personality resides *within* people, and is manifest through behavior in diverse ways across the varied settings of life. As a result, the same individual even in two vastly different contexts separated by many years – such as his or her classroom as an elementary school student, or a clinic interview room as a middle-aged adult – remains recognizably the same person.

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Appendix A: Supplemental tables of teacher's ratings of personality with directly observed behavior

Teacher's ratings of *Submissive* in 1965 or 1967 correlated with direct observations of behavior in 2008-2009.

<u>## - RBQ Item</u>	<u><i>r</i></u>
<u>Positive</u>	<u>N = 144</u>
26 – Seeks reassurance	.30***
21 – Expresses insecurity	.27***
13 – Exhibits awkward interpersonal style	.26***
18 – Expresses agreement frequently	.23**
47 – Expresses self-pity or victimization	.23**
36 – Behaves in fearful or timid manner	.20*
40 – Keeps other(s) at a distance	.20*
39 – Expresses guilt	.20*
50 – Gives up when faced w/obstacles	.18*
29 – Seeks advice	.17*
35 – Unusual or unconventional appearance	.17*
60 – Seems detached from situation	.16*
<u>Negative</u>	
53 – Speaks fluently; Expresses ideas well	-.27***
07 – Exhibits social skills	-.26***

15 – High enthusiasm and energy level	-.21*
41 – Interest in intellectual/cognitive matters	-.19*
23 – Exhibits high degree of intelligence	-.19*
25 – Initiates humor	-.18*
45 – Displays ambition	-.18*
04 – Tries to control situation	-.18*
27 – Exhibits condescending behavior	-.16*
56 – Speaks in a loud voice	-.16*
<u>20 – Is talkative</u>	<u>-.15*</u>

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Submissive* was defined as: usually easily led or persuaded by others; seldom or never sticks up for own rights; gives in easily in arguments. Probability of this many correlates significant by chance (1,000 trials), $p = .001$.

Teacher's ratings of *Spiteful* in 1965 or 1967 correlated with direct observations
of behavior in 2008-2009.

## - RBQ Item	<i>r</i>
<u>Positive</u>	<u>N = 144</u>
15 – High enthusiasm and energy level	.29***
05 – Dominates situation	.22**
20 – Is talkative	.21*
11 – Physically animated; Moves a lot	.19*
43 – Says/does something interesting	.18*
56 – Speaks in a loud voice	.18*
16 – Displays wide range of interests	.18*
04 – Tries to control situation	.18*
07 – Exhibits social skills	.17*
02 – Volunteers Information about Self	.17*
<u>Negative</u>	
21 – Expresses insecurity	-.23**
18 – Expresses agreement frequently	-.20*
44 – Says negative things about self	-.20*
36 – Behaves in fearful or timid manner	-.19*
24 – Expresses sympathy	-.19*
40 – Keeps other(s) at a distance	-.18*
08 – Reserved and unexpressive	-.18*

39 – Expresses guilt	-.17*
60 – Seems detached from situation	-.17*
47 – Expresses self-pity or victimization	-.16*
13 – Exhibits awkward interpersonal style	-.16*
28 – Seems likeable	-.15*
<u>22 – Physical signs of tension/anxiety</u>	<u>-.15*</u>

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Spiteful* was defined as: deliberately does or says things which annoy or hurt others; says hateful things about others; belittles others.

Probability of this many correlates significant by chance (1,000 trials), $p = .002$.

Teacher's ratings of *Outspoken* in 1965 or 1967 correlated with direct observations of behavior in 2008-2009.

<u>## - RBQ Item</u>	<u><i>r</i></u>
<u>Positive</u>	<u>N = 144</u>
53 – Speaks fluently; Expresses ideas well	.33***
45 – Displays ambition	.29***
05 – Dominates situation	.28***
41 – Interest in intellectual/cognitive matters	.27***
23 – Exhibits high degree of intelligence	.27***
15 – High enthusiasm and energy level	.23**
07 – Exhibits social skills	.23**
04 – Tries to control situation	.22**
27 – Exhibits condescending behavior	.21*
56 – Speaks in a loud voice	.20*
16 – Displays wide range of interests	.16*
54 – Emphasizes accomplishments	.16*
<u>Negative</u>	
29 – Seeks advice	-.28***
18 – Expresses agreement frequently	-.27***
21 – Expresses insecurity	-.26***
13 – Exhibits awkward interpersonal style	-.26***
50 – Gives up when faced w/obstacles	-.22**

26 – Seeks reassurance	-.21*
60 – Seems detached from situation	-.20*
39 – Expresses guilt	-.19*
36 – Behaves in fearful or timid manner	-.17*
<u>22 – Physical signs of tension/anxiety</u>	<u>-.16*</u>

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Outspoken* was defined as: speaks his (her) mind without reservation or hesitation; seldom or never hesitates to express views and opinions on any subject. Probability of this many correlates significant by chance (1,000 trials), $p = .004$.

Teacher's ratings of *Socially Confident* in 1965 or 1967 correlated with direct observations of behavior in 2008-2009.

## - RBQ Item	<i>r</i>
<u>Positive</u>	<u>N = 144</u>
53 – Speaks fluently; Expresses ideas well	.34***
07 – Exhibits social skills	.28***
23 – Exhibits high degree of intelligence	.26***
41 – Interest in intellectual/cognitive matters	.26***
04 – Tries to control situation	.24***
52 – Offers advice	.24***
06 – Appears relaxed and comfortable	.24***
05 – Dominates situation	.23**
27 – Exhibits condescending behavior	.20*
45 – Displays ambition	.19*
<u>Negative</u>	
50 – Gives up when faced w/obstacles	-.31***
13 – Exhibits awkward interpersonal style	-.30***
21 – Expresses insecurity	-.28***
44 – Says negative things about self	-.27***
36 – Behaves in fearful or timid manner	-.25***
40 – Keeps other(s) at a distance	-.23**
22 – Physical signs of tension/anxiety	-.21*

29 – Seeks advice	-.21*
60 – Seems detached from situation	-.20*
47 – Expresses self-pity or victimization	-.20*

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Socially Confident* was defined as: approaches others without hesitation; shows poise when performing before others. Probability of this many correlates significant by chance (1,000 trials), $p = .004$.

Teacher's ratings of *Assertive* in 1965 or 1967 correlated with direct observations of behavior in 2008-2009.

<u>## - RBQ Item</u>	<u><i>r</i></u>
<u>Positive</u>	<u>N = 144</u>
56 – Speaks in a loud voice	.24***
07 – Exhibits social skills	.20*
15 – High enthusiasm and energy level	.19*
53 – Speaks fluently; Expresses ideas well	.19*
45 – Displays ambition	.18*
25 – Initiates humor	.18*
<u>Negative</u>	
44 – Says negative things about self	-.23**
39 – Expresses guilt	-.23**
18 – Expresses agreement frequently	-.22**
21 – Expresses insecurity	-.21*
40 – Keeps other(s) at a distance	-.19*
13 – Exhibits awkward interpersonal style	-.19*
60 – Seems detached from situation	-.18*
36 – Behaves in fearful or timid manner	-.18*
26 – Seeks reassurance	-.18*
50 – Gives up when faced w/obstacles	-.18*
<u>22 – Physical signs of tension/anxiety</u>	<u>-.17*</u>

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Assertive* was defined as: bossy; usually attempts to direct the actions of others; is convinced his (her) way is the best way of doing things; shows others “how things should be done”. Probability of this many correlates significant by chance (1,000 trials), $p = .006$.

Teacher's ratings of *Imaginative* in 1965 or 1967 correlated with direct observations of behavior in 2008-2009.

<u>## - RBQ Item</u>	<u><i>r</i></u>
<u>Positive</u>	<u>N = 144</u>
53 – Speaks fluently; Expresses ideas well	.29***
41 – Interest in intellectual/cognitive matters	.26***
23 – Exhibits high degree of intelligence	.25***
07 – Exhibits social skills	.19*
04 – Tries to control situation	.19*
<u>Negative</u>	
44 – Says negative things about self	-.23**
21 – Expresses insecurity	-.22**
29 – Seeks advice	-.21*
39 – Expresses guilt	-.21*
22 – Physical signs of tension/anxiety	-.20*
47 – Expresses self-pity or victimization	-.20*
<u>13 – Exhibits awkward interpersonal style</u>	<u>-.19*</u>

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Imaginative* was defined as: has an active, vivid imagination; very fanciful; sees possibilities overlooked by others. Probability of this many correlates significant by chance (1,000 trials), $p = .034$.

Teacher's ratings of *Restless* in 1965 or 1967 correlated with direct observations of behavior in 2008-2009

<u>## - RBQ Item</u>	<u><i>r</i></u>
<u>Positive</u>	<u>N = 144</u>
16 – Displays wide range of interests	.23**
20 – Is talkative	.21*
15 – High enthusiasm and energy level	.19*
56 – Speaks in a loud voice	.19*
02 – Volunteers Information about Self	.19*
<u>Negative</u>	
39 – Expresses guilt	-.25***
21 – Expresses insecurity	-.19*
46 – Blames others	-.19*
44 – Says negative things about self	-.18*
<u>18 – Expresses agreement frequently</u>	<u>-.17*</u>

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. *Restless* was defined as: constantly or frequently moves about the room; unable to settle down after an activity period or recess.

Probability of this many correlates significant by chance (1,000 trials), $p = .035$.

Appendix B: Simultaneous Regression using Big Five Personality to Predict Directly

Observed Behavior

Simultaneous Regression using Big Five Personality to Predict Directly Observed Behavior

## - RBQ Item	E	A	C	N	O	Multiple R
<u>Positive</u>						
56 - Speaks in a loud voice	.38***	.08	.01	.00	-.05	.40***
15 - High enthusiasm and energy	.37***	.21*	-.00	.04	.05	.46***
20 - Is talkative	.35***	.18*	-.11	.11	.08	.41***
04 - Tries to control situation	.32***	-.13	.11	.08	.13	.37***
05 - Dominates situation	.30**	-.12	.04	.07	.20*	.39***
02 - Volunteers info. about Self	.26**	.16	-.08	.12	.08	.32**
07 - Exhibits social skills	.25**	.14	.05	.04	.00	.32*
11 - Physically animated; Moves a lot	.25**	.06	-.12	.03	.05	.28*
43 - Says/does something interesting	.23*	-.02	.04	.03	.00	.22
45 - Displays ambition	.21*	.02	.04	-.10	.16	.36**
54 - Emphasizes accomplishments	.18*	.12	.01	.11	.10	.26
24 - Expresses sympathy	-.05	.35***	-.08	.06	-.14	.35
32 - Expresses warmth	-.10	.35***	-.17*	-.02	-.13	.37***
49 - Behaves in cheerful manner	-.00	.28**	.00	-.10	-.09	.33**
62 - Acts playful	.05	.25*	-.08	.02	-.01	.24
03 - Interested in what Partner(s) say	-.05	.21*	-.19*	-.05	-.13	.30*
37 - Expressive in voice, face/gesture	.18*	.20*	-.10	.02	.03	.28*
53 - Speaks fluently	.02	-.05	.24*	-.05	.12	.30*
34 - Expresses hostility	.13	-.21*	.06	.27**	.18	.40***
39 - Expresses guilt	-.10	.08	-.13	.24*	-.08	.36**
47 - Expresses self-pity or victimiz.	-.16	.09	-.09	.24*	.02	.33**
26 - Seeks reassurance	.06	.14	.02	.23*	-.03	.20
14 - Compares self to other(s)	.17	-.18*	.16	.22*	.09	.33**
41 - Interest in intellectual matters	-.07	-.23*	.07	-.23	.31***	.40***
16 - Displays wide range of interests	.19*	.04	.03	.03	.22*	.33**
23 - Exhibits high degree of intellig.	.04	-.17	.08	-.12	.21*	.30*
<u>Negative</u>						
36 - Behaves in fearful manner	-.48***	-.06	.03	-.12	-.14	.52***
50 - Gives up faced w/obstacles	-.41***	.02	-.10	-.05	-.09	.45***
08 - Reserved and unexpressive	-.36***	-.18*	.15	-.09	-.10	.42***
40 - Keeps other(s) at a distance	-.35***	-.33***	.20*	-.09	-.05	.50***
13 - Awkward interpersonal style	-.30***	-.11	-.08	-.07	-.10	.39***

21 - Expresses insecurity	-.28**	.05	-.03	.23*	-.09	.44***
60 - Seems detached from situation	-.23*	-.11	-.00	-.09	-.07	.28*
28 - Seems likeable	-.22*	.14	.10	-.11	-.16	.32**
67 - Exhibits phys. discomfort/pain	-.21*	-.01	-.16	-.11	.02	.24
27 - Exhibits condescending behavior	.13	-.31***	.25**	-.10	.01	.37***
19 - Expresses criticism	.04	-.30**	.14	.13	.11	.36**
55 - Behaves in competitive manner	.26**	-.28**	.23*	-.04	-.03	.39***
33 - Tries to undermine/sabotage	.12	-.27**	.03	.06	.11	.30*
31 - Acts irritated	-.05	-.26**	.07	.07	.03	.30*
65 - Engages in physical activity	.05	-.20*	.08	-.08	-.10	.20
29 - Seeks advice	-.19*	.20*	-.29**	.01	-.06	.39***
58 - Makes/approaches phys. contact	.08	.09	-.24*	.01	-.04	.24
01 - Interviews Other(s)	.14	.05	-.23*	-.08	.02	.24
44 - Says negative things about self	-.17*	.03	-.19*	.18	-.09	.41***
64 - Concentrates; Work hard at task	-.21*	.06	.08	-.27**	.08	.32*
18 - Expresses agreement frequently	-.14	.15	-.05	.11	-.21*	.33**
61 - Speaks quickly	.02	-.04	.07	-.06	-.19*	.20
51 - Behaves stereotyp. gender style	-.12	-.03	.09	-.09	-.18*	.24
22 - Physical signs of tension/anxiety	-.12	-.13	-.13	.00	-.10	.55*
12 - Seems to like other(s)	-.16	.12	-.13	-.10	-.12	.26
30 - Appears to regard self as attract.	.13	-.17	.15	-.06	-.02	.24
46 - Blames others	-.03	-.06	.05	.18	.15	.24
59 - Engages in constant eye contact	-.09	-.05	.09	-.17	-.14	.24
48 - Expresses sexual interest	-.04	-.10	-.16	-.18	.16	.22
63 - Other(s) seek advice from P	-.08	-.04	.11	-.16	-.12	.22
06 - Appears relaxed and comfortable	.14	.09	.05	-.04	-.06	.20
10 - Smiles frequently	-.16	.15	-.04	-.09	-.01	.20
25 - Initiates humor	.13	.09	-.05	-.07	-.02	.20
38 - Interest in fantasy or daydreams	-.00	.13	-.11	.06	.14	.20
42 - Seems to enjoy situation	.07	.05	-.07	-.17	-.00	.20
09 - Laughs frequently	-.08	.18	-.02	.00	.05	.17
52 - Offers advice	.15	-.04	.01	-.01	.05	.17
66 - Acts in self-indulgent manner	-.02	-.06	.03	.09	.08	.17
17 - Talks at other(s)	-.07	-.02	.13	.06	.01	.14
35 - Unusual appearance	-.02	-.03	-.10	-.02	-.07	.14
57 - Speaks sarcastically	.10	-.10	.07	.04	-.05	.14

Note. Standardized betas are presented. RBQ Item content is abbreviated. ***p < .001,

**p < .01, *p < .05.