



Back to the future: *Personality and Assessment* and personality development

Brent W. Roberts *

Department of Psychology, University of Illinois, Urbana-Champaign, 603 East Daniel Street, Champaign, IL 61820, United States

ARTICLE INFO

Article history:

Available online 1 January 2009

Keywords:

Mischel
Personality traits
Sociogenomic model
Personality and Assessment
Personality development

ABSTRACT

In this essay I consider the future of personality development in light of the past effects of *Personality and Assessment* on the field of personality in general and personality development in particular. The essay is organized around (1) the effect of Mischel's book on the foundational theories informing personality development; (2) definitions of personality traits; (3) an alternative model of personality traits, described as the sociogenomic model of personality traits, that can bridge the divide that still characterizes the field of personality development; (4) the application of the sociogenomic model of personality traits to issues of personality trait development, and (5) a "Newtonian" vision for the future of personality psychology.

© 2008 Elsevier Inc. All rights reserved.

"Those tests, including the ubiquitous Myers-Briggs test, have no scientific credibility or predictive value, as Annie Murphy Paul showed in her 2004 book. . . . You can have one Myers-Briggs personality on Tuesday and another when you retake the test on Thursday"

Barbara Ehrenreich (2006)

"Traits that change are not traits at all, one might argue"

John Moore (personal communication 2-21-08).

Beyond their focus on the validity, or lack thereof, and the consistency of personality traits, some might ask why these quotes are relevant to a special issue dedicated to *Personality and Assessment*, as they are from individuals outside of the guild of personality psychology. That is exactly the point. These quotes reflect, in no uncertain terms, the reach and impact of Mischel's argument laid out in *Personality and Assessment*. That is, the perspective that personality traits lack validity and are defined by "invariance" across situations is so widely held that these ideas have traction well outside of the field of personality psychology. One cannot give Mischel full credit for these positions, as the critiques of personality traits have been legion. Nonetheless, to have such influence is an incredible achievement.

The focus of my paper will be to address how the legacy of *Personality and Assessment* will affect the future of the particular domain of personality development. Looking to the future entails having a good grasp of the past. It would be uncontroversial to state that the effect of *Personality and Assessment* was twofold: (1) it bred an antagonism toward personality traits, and (2) it popularized social cognitive approaches and units of analysis. How has

this past affected the present state of personality development? In my opinion, the fallout of *Personality and Assessment* has been a major impediment to progress for the field of personality development. Why? The divisions created by *Personality and Assessment* impeded progress in personality development because it polarized the field into seemingly irreconcilable camps. As I will describe below, these two camps fit neatly into two extreme positions that had unfortunate effects on the study of personality development. One group emphasized stability, the other change. To this day, neither camp seems motivated to acknowledge the obvious truth that it is both.

One might ask, in light of the arguments laid out in *Personality and Assessment*, whether we should care about personality trait development in particular. If personality traits are inconsequential or invalid, then we could spend our time more profitably studying something else. The field of personality development could prosper by ignoring traits and focusing instead on alternative units of analysis, such as schemas, norms, and self-efficacy, for example. It is difficult to argue against expanding one's focus to alternative constructs, but it is just as difficult to accept the argument that traits should be ignored. First, personality traits matter. They predict substantive outcomes, such as mortality, health, marital satisfaction, divorce, and occupational success (Ozer & Benet-Martinez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Possibly more importantly, they shape the emotional and experiential terrain of people's lives (Diener, 2000). They define, in part, how people experience the world, whether or not that results in consequences deemed important by society. Understanding how personality traits develop would then be critical for understanding both important social outcomes as well as a key component of human nature.

The remaining reason why I think it makes sense to focus on personality trait development is that personality traits are the explicit focus of socialization efforts. Children are socialized children

* Fax: +1 217 244 5876.

E-mail address: broberts@cyrus.psych.uiuc.edu

to become autonomous adults who are in charge of their own destiny, if not the destiny of both their parents and their own children. By definition, this means that the goal of parenting and schooling is to arm children with skills, abilities, and character structures that they can take with them into different environments and use to their benefit. That is, we attempt to provide children with personality traits—things that work across situations that will not dissipate into the ether once new environments are encountered.

So, in the context of a retrospective on *Personality and Assessment*, I think it is highly appropriate to focus on how it affected research and theorizing about personality trait development. In the first section of this paper I take a closer look at the criticisms laid out against traits in *Personality and Assessment* and the reactions to the book that inform personality development. Then, in the second section I review definitions of personality traits, because a clear definition is necessary to discuss how personality traits develop. In the third section, I offer the sociogenomic model of traits (Roberts & Jackson, 2008) as an alternative trait model that will hopefully serve to integrate trait and social cognitive approaches to personality. In the fourth section, I highlight how this alternative trait model might influence research on personality trait development. Finally, I discuss these issues within the broader context of personality psychology.

1. The fallout

In *Personality and Assessment* Mischel (1968) made many criticisms against personality traits, but four were key to the development of a negative schema toward traits and the polarization of the field of personality development: (1) traits had limited utility to predict behavior because they could not muster a correlation above .3 (i.e., the infamous “personality coefficient”); (2) Stability was a result of semantic similarity biasing observer reports over time (e.g., traits are in the eye of the beholder); (3) if there is stability it is attributable to the situation, not the person, and (4) behavior was not cross-situationally consistent.

As has been repeatedly pointed out, the first three of these arguments have been soundly refuted (see Block & Block, 2006; Craik, 1969; Funder, 2008, chap. 22; Funder & Ozer, 1983; McAdams & Pals, 2006; Roberts, 2005; Roberts et al., 2007). The fact that many of the arguments laid against traits in *Personality and Assessment* have been disconfirmed is an interesting footnote to the history of this text. The book is still cited often, but clearly the significance of the book has morphed into something beyond the veracity of its arguments. In no uncertain terms, it has become an institution through which researchers can claim an identity—either for or against the trait model of personality with one simple citation. More importantly, the continued relevance of *Personality and Assessment*, lies not in the soundness of its argument, but the basic premise that there is something lacking in a vision of personality psychology that focuses almost exclusively on the primacy of traits. I will return to this point below.

The fourth argument that behavior was not cross-situationally consistent has been a bit more vexing for the field of personality and the sub-discipline of personality development in particular. As the quotes at the start of this essay imply, the cross-situational inconsistency of behavior has been interpreted by many as proof that personality traits are questionable constructs, at best. The lack of cross-situationally consistent behavior has historically been the leading reason cited for the need of an alternative approach to personality trait theory; mainly that behavior is not consistent across situations, therefore personality traits could not, by definition, exist (Mischel & Shoda, 1995). If this conclusion were true, it would make the study of personality trait development a problematic field of study. Why study a concept without validity?

Of course, the study of personality traits and personality development did not disappear with the publication of *Personality and Assessment* and the argument that behavior was inconsistent across situations. In fact, the response was multifaceted. In something of an oversimplification, I would argue that three clear positions emerged in response to Mischel’s book that are highly relevant to where we stand today in terms of studying personality development. I would characterize these positions as the “Ignore It, and It Will Go Away” approach, the “Howitzer” approach, and the “Alice in Wonderland” approach.

The “Ignore It, and It Will Go Away” approach reflects the fact that within personality psychology the arguments laid out in *Personality and Assessment* had a chilling effect on the use of the term “trait” and research on personality traits as a field of inquiry. Many researchers moved on to study different constructs, such as goal units, achievement motivation, or self-concept constructs, such as self-esteem and self-control (e.g., Cantor, 1990; Dweck & Leggett, 1988). Other researchers continued to study constructs that were operationally indistinguishable from traits, but called them something different, such as dispositions, personal resources, reputations, or folk concepts. The presumptive assumption behind this approach was that if we ignored personality traits, then we can go on studying personality development, but focus on putatively different constructs. This approach essentially tried to side-step the debate over the influence of persons and situations on behavior and in so doing simply used the “jangle” fallacy to good effect.

The “Howitzer” approach was to try and blow a hole in the side of the arguments laid out in *Personality and Assessment*. Though clearly not the first to attempt this approach, this idea is best exemplified by the proponents of the Five Factor Model (McCrae & Costa, 1999; Terracciano, McCrae, & Costa, 2006). Within the context of the FFM, a small group of researchers produced hundreds of studies expounding on the structure, utility, and consistency of personality traits. In terms of personality development, the FFM has emphasized the consistency of personality traits across time and their causal superiority over all other variables, including the situation. The gestalt that emerges from the prolific writings of the FFM proponents is that the Big Five traits are impressively stable across time, which is sometimes misconstrued as countering the arguments in *Personality and Assessment* that behavior is inconsistent across situation. The FFM is so clearly organized in opposition to social cognitive approaches to personality that the two approaches are often lamented as incommensurate models of personality (Cervone, Shadel, & Jencius, 2001; Mischel & Shoda, 1998).

The “Alice in Wonderland” approach is probably the most widely held perspective in personality psychology. As one would infer from the reference to Lewis Carol’s book, this perspective attempts to give every perspective its due, especially in terms of consistency and change. One example would be McAdams’ (1994) levels model of personality. In this model, personality traits and social cognitive units of analysis, such as motives and goals, constitute different levels of analysis (McAdams, 1994; McAdams & Pals, 2006). Personality traits constitute the “stable” level of analysis in which there is little or no development, just as argued McCrae and Costa (1999). Other levels, such as motives and narrative dimensions are characterized by units of analysis that do change and are intrinsically “dynamic”, just as Mischel argued. Thus, like in Alice in Wonderland, everyone gets a prize. The trait psychologists can continue to focus on factor structures and test-retest stability. The social cognitive psychologists can study goals, motives, beliefs, and affect—things that putatively change. And, narrative psychologists can prosper as well.

Thus, the three primary theoretical models guiding personality development that grew out of implicit or explicit responses to *Personality and Assessment* either (1) ignore traits, (2) claim traits are

so stable as to not change enough to warrant investigating, or (3) accept that traits do not change and point to other units of analysis that do and therefore should be the focus of developmental research. With these being the modal reactions to Mischel's book, one can see why the arguments in *Personality and Assessment* still resonate with researchers today. There has yet to be a successful integration of trait and social cognitive perspectives on personality psychology.

There are two fundamental problems with these modal ways of conceptualizing personality psychology and personality traits in particular. First, as we will discuss in more detail below, the issue of cross-situational consistency was never germane to the definition of personality trait. Second, these dominant models of personality have a small empirical problem to confront; personality traits demonstrate both continuity and change (Mroczek & Spiro, 2003; Roberts & Mroczek, 2008; Roberts, Wood, & Smith, 2005). Conversely, social cognitive units of analysis, such as life goals, are remarkably stable (Roberts, O'Donnell, & Robins, 2004). The significance of these two facts has yet to be fully acknowledged or integrated into theoretical systems guiding the Five Factor Model, social cognitive models, or levels approaches to personality. If longitudinal findings were fully integrated into existing models, things would have to change. The proponents of the Five Factor Model and the levels model would have to construe traits as dynamic constructs. Thus, the entire bedrock of the FFM would crumble and the levels metaphor would dissipate. The social cognitive proponents would be forced to admit that traits were not only real but a viable unit of analysis as they now qualify as dynamic constructs. It would also be necessary to explain the surprising levels of continuity found in social cognitive variables over time. As is the case in many intellectual debates, the path to reconciliation is simple to follow, but clearly not easy to walk.

In my opinion what is needed to move forward is an understanding of personality traits that can successfully incorporate the empirical fact that they demonstrate both continuity and change over time, as well as less than perfect "invariance" across situations. Ironically, the way to do this is to marry traditional trait psychology with social cognitive approaches to personality. In the next section, I will get out my metaphorical shotgun and attempt to force a marriage.

2. What are personality traits, anyway?

To successfully marry trait and social cognitive approaches requires some clarity on just what is meant by "personality trait." Historically, there has been much definitional confusion concerning the concept of personality trait. As a starting point it makes sense to consider the one put forward in *Personality and Assessment*. In most of the descriptions of the social cognitive model that came into being as a result of *Personality and Assessment*, the notion of a personality trait was equated with the idea of "invariance" (Mischel & Shoda, 1995). That is, personality traits are defined as behaving in identical ways across diverse situations. The problem with this definition is that it corresponds to no known definition of personality traits that came before it or followed after it. This definition, was, and remains, a straw man (Johnson, 1997).

In contrast to the depiction of traits being decontextualized and necessitating invariant behavioral patterns, Allport's (1961) description of traits was quite clear. "A trait is, then, a neuropsychic structure having the capacity to render many stimuli functionally equivalent, and to initiate and guide equivalent (meaningfully consistent) forms of adaptive and expressive behavior" (p. 347). Intrinsic to this definition is the fact that behavior is inconsistent across situations. For example, in his discussion of the trait of politeness Allport notes, "A truly polite person will vary his behavior even to the extent of breaking his polite habits in order to main-

tain his trait of politeness. . . . A polite American while traveling will quickly learn to belch in satisfaction over his meal in some countries; in others, to avoid this hearty act." (p. 346). Thus, having a trait does not mean one acts like an automaton, invariably eructating regardless of the context. It entails behaving in "meaningfully consistent" ways which means that inconsistency in behavior is an intrinsic part of the definition of a personality trait.

A cursory examination of the numerous definitions of personality traits influenced by Allport reveals a surprising consistency in the acknowledgment of inconsistency. For example, Tellegen (1991) defined traits as "a psychological (therefore) organismic structure underlying a relatively enduring behavioral disposition, i.e., a tendency to respond in certain ways under certain circumstances" (p. 622). Wiggins (1997) writes that "According to the dispositional view, when we say that John is aggressive, we are asserting that it is a good bet that in certain circumstances, John will behave aggressively" (p. 103). Likewise, Funder (1991) argued that "Every global trait is situation specific, in the sense that it is relevant to behavior in some (perhaps many), but not all, life situations" (p. 36). Thus cross-situational invariance of behavior was never a critical component of the definition of a personality trait (Johnson, 1999).

In fact, cross-situational variation is a key element to almost all definitions of personality traits (Johnson, 1999). Try a simple thought experiment. Consider, as was described eloquently in Higgins and Scholer (2008) chap. 6, what it means to be authoritarian (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). It means that a person does whatever his or her leader asks and punishes subordinates for stepping out of line. Intrinsic to the definition is a juxtapositioning of compliance and punitiveness that if not properly contextualized would look incoherent. Thus, inconsistency in behavior is an intrinsic part of the definition of being authoritarian. Moreover, the conceptualization and assessment of authoritarianism is explicitly contextualized—authoritarians change their behavior systematically depending on the where in the status hierarchy they are located at that moment. Of course, not all traits are as complicated as authoritarianism, but all traits are defined and operationalized within relevant contexts (e.g., Funder, 1991). One cannot be extraverted when alone.¹

Another way to see the contextualized nature of personality traits is to read the items from any randomly selected personality inventory. Any cursory reading of a personality inventory will reveal a mix of items, many of which are clearly situated. For example, here are several items from the Zuckerman–Kuhlman Personality Questionnaire (Zuckerman & Kuhlman, 1993): "I tend to feel uncomfortable at big parties", or "I like to wear myself out with hard work or exercise." One cannot infer a trait without context. This is not to say that personality trait psychologists have been forthcoming with a systematic cataloguing of situations and how they blend with predilections to become manifest as traits. Nonetheless, the argument that behavior must be consistent across situations was a nonstarter from the beginning; as is the penchant to describe global traits as decontextualized. Unfortunately, it is common to this day for people to mischaracterize personality traits as "decontextualized". This is a mischaracterization that was directly inspired by *Personality and Assessment*.

Probably the saddest result of the promulgation of the idea that cross-situational consistency in behavior was germane to the existence of personality traits was that many people took it seriously. Therefore, they went about trying to find evidence for robust, cross-situational behavioral consistency. The problem with this search is two fold. First, as we see above, the existence of behav-

¹ If one insists on holding conversations in the absence of others, it may be the result of something other than extraversion.

ioral consistency is not at all synonymous with the definition personality traits. Rather temporal consistency is key to the existence of personality traits, and there is little argument over its existence. Second, no-one ever provided a point estimate for what researchers should expect to find. Depending on one's level of aggregation, the estimates of behavioral consistency have ranged from 0 (Mischel & Peake, 1982) to .99 (Fleeson, 2001), with most estimates falling somewhere in between. If we limit ourselves to highly controlled studies conducted by relatively disinterested parties, the correlation of a similar behavior across two situations is between .2 and .4 (Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004; Funder & Colvin, 1991). Is this a problematically low number? When psychometricians evaluate the quality of scale items they often use item-total correlations as a guide to whether any given item belongs to the domain of the scale—item-total correlations between .2 and .4 are common for most major measures in psychology, not just personality psychology. It is quite possible that there was never an issue here.

The second flaw in the argument that behavioral inconsistency was germane to the definitional soundness of personality traits was the fact that the definition of a personality trait typically rests on more than behavior. One can respond to a situation not only with behavior, but also with affect and cognition. Thus, more generic definitions of personality traits encompass relatively enduring patterns of *thoughts, feelings, and behaviors* (Johnson, 1997). Extraversion blends positive affect (feelings), with beliefs about what one does in social settings (thoughts), to estimates of one's typical response to other people (behaviors). When one equates personality traits only to behavior, then thoughts and feelings are automatically excluded, which seems odd if not nonsensical. As Allport (1961) noted, the belief that one should be polite in the company of strangers can lead to robustly different gustatory behaviors.

Cross-situational consistency has also proven to be a source of both inspiration and confusion for the field of personality trait development. It inspired, in part, the numerous reports of the test-retest stability of personality traits. Given the definition of personality traits (e.g., relatively enduring), one can see why this was the case. If traits are proven to be relatively enduring, then they demonstrate a key feature of their definition and are therefore valid. Unfortunately, the test-retest stability of personality traits is not germane to the issue of cross-situational consistency of behaviors. This has not stopped both sides of the argument to conflate temporal stability and cross-situational consistency. For example, Mischel and Shoda (1998): "A good example of this dualistic approach to personality is seen in pursuit of the question of whether human personality is malleable or stable over the life course, with trait conceptions of personality generally demonstrating stability and process conceptions of personality typically finding change..." These perspectives are not actually in contradiction to one another, but simply examining phenomena at different levels of analysis (Roberts & Pomerantz, 2004).

Finally, the most important thing that emerges from a close examination of the definition of personality traits is that they are indistinguishable from concepts that emerged from the social cognitive approach to personality. Consider for a moment the definitions of personality traits which are mentioned above and can be synopsized as the following: *Personality traits are the relatively enduring patterns of thoughts, feelings, and behaviors that reflect the tendency to respond in certain ways under certain circumstances.* Take as a point of comparison, the description of the Cognitive, Affective, Personality System (Mischel & Shoda, 1998): "Note that behavior generation ultimately depends both on the situational features and on the cognitive-affective organization of the system. When the relevant situational features are present, characteristic processes become activated in a predictable pattern (p. 240). Both definitions identify coherent patterns of thoughts, feelings, and behaviors that

are contingent on eliciting situations. As is obvious from the overlap in these definitions, The CAPS model is simply a reiteration and deeper analysis of the underlying components of personality traits (Johnson, 1999).

This is not to say that personality traits and the CAPS model are entirely redundant. In fact, the real contribution of the CAPS perspective, and by way of indirect effect *Personality and Assessment*, is the identification and analysis of social cognitive units of analysis. Essentially, the CAPS model lifted the hood on the trait-mobile to show the concerned driver what the engine looks like. A valid criticism of many modern personality trait theorists and researchers is that they have not provided a deeper analysis of the constituent elements that make up traits, nor the mechanisms that elucidate how they cause things to occur (c.f. Funder, 1991). Of course, the opportunity to do so lies in acknowledging and integrating some of the concepts found in social cognitive approaches to personality psychology with classic trait models.

3. The sociogenomic model of personality traits

To help push the unwilling trait and social cognitive participants to the altar, I will expand on a model that we recently described as the sociogenomic model of personality traits (see Roberts & Jackson, 2008). The inspiration for this new model of personality traits was to provide a focal point to a discussion of the links between personality and biologic factors associated with personality (Roberts & Jackson, 2008). Although inspired by a sociogenomic, or biologic/evolutionary approach to personality, the model is just as applicable to traditional trait conceptualizations and social cognitive models of personality. The model builds on other state-trait models (e.g., Nezlek, 2007; Steyer, Schmitt, & Eid, 1999) and differs in subtle but significant ways from the FFM, Neo-Allportian, social cognitive, and the levels approaches to personality traits.

Structurally, the model proposes that states are made up of the constituent elements of thoughts, feelings, and behaviors (see Fig. 1). In this case, the best representative units of analysis at this level would be those identified in social cognitive terms, such as schemas, beliefs, chronically accessible constructs (thoughts), affects and moods (feelings), and of course behaviors. Traits are made up of stable, enduring patterns of states (thoughts, feelings, and behaviors) and thus cause future states (Funder, 1991). As Johnson (1999) noted, the core of the definition of traits is the enduring patterns of thoughts, feelings, and behaviors that are sustained over time in functionally equivalent situations. It is the repetitions in states that capture what we mean by a trait. It is the fact that a friend or colleague is habitually late to social engagements and does not feel guilty about it (repetitive behavior and affect) that leads one to conclude that he is not punctual. It is these repetitions in people's state profiles that are key to the inference that traits exist. They also serve as a cause of future states. Being fixed into a configural pattern would mean that the colleague would most likely not interpret a future meeting as a salient indicator of the need to be on time.

These repetitions also provide a figure-ground relationship to states and the process of change in traits. People can act "out of character" because of environmental influences, but this type of inconsistency may have little or no impact on the validity of the trait construct, nor on long term personality trait change. It is a behavioral hiccup, little else. This is another way in which inconsistency is irrelevant to the definition and validity of the notion of traits. Behavioral inconsistency from moment to moment is to be expected. The validity of the trait notion rests on the configural consistency of states across functionally equivalent situations and time.

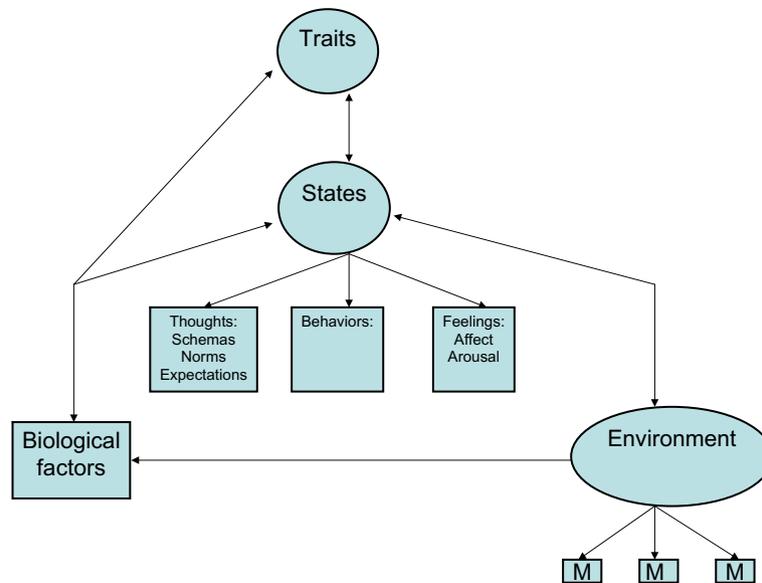


Fig. 1. The sociogenomic model of personality traits.

The differentiation of state from trait and the proposal that environments affect states directly also helps to explain shifts in behaviors that may have little or nothing to do with changes in personality traits. For example, some effective programs designed to decrease bullying in schools concentrate on creating a pervasive environmental effect (Olweus, 1997). Teachers, parents, administrators, and students are convinced to engage in activities to limit and punish bullying. The focus is not on the personality traits of the bullies. Rather, it is on creating an environment that does not permit bullying behavior to occur. Presumably, in these situations, the environment is effectively squashing the state-like attributes related to bullying, not the aggressive impulses that sometimes underlie the acts. In this way, environments can have pervasive effects on specific types of behaviors because they act on states, not on traits.

On the other hand, long-term shifts in states would have serious ramifications for personality trait change. Environmental effects typically act on momentary thoughts, feelings, and behaviors—that is, in the sociogenomic model of traits environments cause changes in states. If these state changes become extended, then they may cause changes in traits in a bottom up fashion (Roberts, 2006a). This bottom up nature of the socialization effect of environmental experiences is an important feature of the sociogenomic model of traits. It points to how personality *change* becomes personality *development*. For example, the consequences of a long-term investment in one's spouse or work may bring with them experiences and expectations that continuously reward a change in thoughts, feelings, and behaviors. For example, students reward professors for being organized and structured. They like to know when the test will be held, when papers are due, and what they should read. Student actions and opinions may then lead some professors to change their approach to teaching and improving their classroom organization. Over the course of several semesters, the positive reaction of the students may bring a greater sense of work satisfaction and in turn, an increasing belief that being organized, at least in class, is a good thing. Over time, these role-based experiences may then be generalized to other domains, as it is often the case that students are not alone in their desire for professors to be organized. Sometimes, even editors and peers are pleased with reliable behavior too.

One obvious derivation of this bottom up aspect of the model is that environments will most likely affect personality trait change

in a slow, incremental fashion (Roberts, 2006b, chap. 1). Thus in the sociogenomic model of traits, states take on a significant causal and mediational role as they account for the path through which prolonged environmental effects will change neuroanatomical structures or gene expression, and thus change personality traits. In this way, we believe the sociogenomic model of traits solves the fundamental rift between trait and social cognitive models of personality. The state level of analysis is intrinsically equal to the social cognitive perspective. Therefore, both levels of analysis are included and their relationship specified.

The path from states to traits, implying that states cause changes in traits, also distinguishes the sociogenomic model from the depiction of traits in the FFM (McCrae & Costa, 1999). In the Five Factor Model traits are entirely exogenous, implying that they only cause other constructs and are not themselves caused by life experiences. This small distinction is one of the most significant barriers to a successful integration of social cognitive and trait models as it implies that social cognitive psychologists are studying the detritus of personality traits. It also implies that traits change only through gross biological insult (McCrae & Costa, 2008, chap. 5). In contrast, in the sociogenomic model the environment can affect biological factors and states directly, and traits indirectly. For example, accidents can impart serious changes in neuroanatomy that in turn affect personality traits through their impact on physiological systems. And as described above, environments can affect biological systems indirectly through the way environments make people think, feel, or behave in any given situation (e.g., states). On the other hand, biological factors do not affect the environment directly, but indirectly through the personality trait or state. Viewed this way, personality traits and states serve as the conduit between biology and significant life outcomes. Furthermore, the trait can be directly affected by biological functions—children are born with a wide variety of temperamental starting values that are then presumably shaped by environmental experiences. In turn, traits will not affect biological structures directly, but indirectly through the effect of continuous state effects. For example, continuous states of anxiety and stress can lead to neuroanatomical changes in brain structures (McEwen, Liston, & Morrison, 2006). Stressful states likely interact with genes responsive to stress, which, in turn, affect the neuroanatomy that shapes the habitual ability of the person to respond to future environmental insults—thus, a trait is born.

The other advantage of integrating traits and states is that it opens up the opportunity to use experimental methods to demonstrate the causal role of traits. When conceptualized in an undifferentiated fashion, traits pose causal conundrums for research scientists. Although they are presumed to cause outcomes, it is a challenge to empirically demonstrate their causal effect given the fact that they are difficult to manipulate. On the other hand, if states represent the mechanistic interface of traits, then manipulating states and demonstrating concordant changes in relevant outcomes would serve as a proxy demonstration of the causal role of traits. For example, scientists could put people in an extraverted mind set and show how this mindset then affects things like mood, beliefs, and behaviors. Thus, a successful merger of trait and social cognitive models opens the door for traditional trait psychologists to test causal hypotheses directly with experimental methods (McNiel & Fleeson, 2006).

There is an important distinction that also needs to be drawn between the sociogenomic model of traits and the Neo-Allportian model of traits (Funder, 1991). Specifically, the content of traits in the sociogenomic model does not include motives, goals, or aspirations. In the Neo-Allportian model of traits it is proposed that affect and behavior arise because of latent desires or goals. In contrast, I propose that traits are relatively non-conscious, non-motivational entities. By definition, the repetitive nature of traits and their constituent elements means that the entire system of thoughts, feelings, and behaviors has been habituated. That is to say, the repetitions arise because of the non-conscious stimulus-response patterns—a “readiness to respond”, as detailed by Bowlby (1980). The environment affords an appraisal that is dominated by schemas that are not typically consciously considered. It makes little sense to propose that most behavior or affect arises through any cognitive deliberation. Cognitively deliberating over the minutia of life would be a grossly inefficient way of living.

This is not to say that motives and goals are unimportant to personality or unimportant to behavior. Rather, given the empirical data on the relation between goals and personality traits (e.g., Emmons & McAdams, 1991; Roberts & Robins, 2000) it is clear that they are associated with one another, but at a level far more modest than would be the case if motives and goals were an intrinsic component of personality traits. The distinction between goals and traits can also be drawn out in a conceptual analysis. Take for example the goal to be organized and the trait of being organized. One does not typically develop a goal to be more organized unless there is some dissatisfaction with one's present level of organization. Or, put in statistical terms, the goals for specific personality-related behaviors should be negatively correlated to actual trait levels and the typical feelings and behaviors associated with those traits. This provides further justification for McAdams' (1994) splitting of traits and goals into differing domains, as well as our organization of personality units into four separate domains (traits, motives, abilities, and narratives) in the neo-socioanalytic model of personality (Roberts & Wood, 2006, chap. 2). Both empirically and conceptually, these are distinct domains that will both have effects on state-level behavior.

I put forward the sociogenomic model of personality traits in the hope that it will provide an integrative alternative to the existing models of traits that have dominated the literature in the last few years. This model can serve several purposes. First, it provides a structure that further articulates the argument that the differences between trait and social cognitive approaches to personality are mostly a reflection of working at different levels of analysis, not working on diametrically opposed theoretical models (Roberts & Pomerantz, 2004). It also provides a testable model of the processes underlying the content of personality traits as well as how they develop over time. For example, based on this model, we would expect social cognitive systems to mediate the relation be-

tween traits and other factors, such as the environment. We would also expect motives and goals to constitute a separate domain of psychological functioning (Roberts & Wood, 2006), that would not directly overlap with trait-like patterns of thoughts, feelings, and behaviors. With these clear distinctions from previous models, I hope the sociogenomic model can not only be tested, but also revised and improved upon.

4. Applying the sociogenomic model of traits to personality trait development

In a series of papers, we have described what we call the neo-socioanalytic model of personality trait development (Lodi-Smith & Roberts, 2007; Roberts & Caspi, 2003; Roberts & Wood, 2006; Roberts et al., 2005). In the context of this essay, the sociogenomic model of traits is subsumed by the broader framework of the neo-socioanalytic model of personality development. To date, the neo-socioanalytic model has attempted to do two things (1) provide a structural model for organizing the units of analysis within personality psychology, and (2) identify the major patterns of continuity and change in personality traits and attempt to discern the mechanisms partially responsible for these patterns. Organized around a series of principles and assumptions, we have pointed out that personality traits become increasingly consistent with age, as well as increasingly mature—that is, people become more socially dominant, agreeable, conscientious, and emotionally stable, especially in young adulthood. We have argued that these patterns of development by necessity are the result of both genes and environment, and that many of them inevitably reflect gene-by-environment interactions. More importantly, through the idea of the social investment principle, we have argued that our societies are structured to facilitate this increasing consistency and maturity. And, in turn, our psychology, in the form of expectations and goals for our development, converge on a similar target, thus structuring our environments according to our vision of personality development and creating a corresponsive relation between person and experience across the life course. The emerging picture of personality trait development being a continuous transaction between person and life structures is consonant with the life span perspective that humans are open systems (Baltes, 1997). That is, personality traits can change at any stage of the life course regardless of whether or not they do.

In considering the potential explanations for personality trait development, we found the only satisfying account came from merging traditional trait and social cognitive perspectives (Roberts & Caspi, 2003). These ideas are built into the sociogenomic model of personality traits. Specifically, we should find that social cognition and emotion should mediate and moderate the processes of continuity and change in personality traits. Somewhat ironically, social cognitive factors are more clearly linked to personality continuity than personality change. Take for example the notion of a cognitive schema. A person's schema for being extraverted can play a number of roles in maintaining a consistent personality trait over time. Through reactive processes (Caspi & Bem, 1990), people with strong schemas for extraversion will interpret their world in a way that is consistent with their extraversion. To an extravert, other people will be perceived as opportunities for social engagement. In contrast, the person with a shyness schema will view other people with some trepidation. These schemas could also affect the situations a person selects and the way they interpret these situations (e.g., social interaction is fun). In these ways, being schematic for a specific trait would facilitate continuity in that trait over time.

We have catalogued an initial list of social cognitive processes that should be linked to continuity (Roberts & Wood, 2006; Roberts, Wood, & Caspi, 2008). Of course, the environment itself

was one of the mechanisms originally proposed as a facilitator of continuity (Mischel, 1968), and there is some longitudinal twin evidence to that effect (Johnson, McGue, & Krueger, 2005; Takahashi et al., 2007). In contrast to an ambiguously defined “situation”, we have proposed that the environmental continuity that counts the most is role continuity, not necessarily physical or even psychological similarity in various situations of one’s life. For example, being a leader in two different institutions would entail confronting two potentially different psychological climates, yet the role and the expectations of the role may be identical. Despite the physical environment changing, the role is played the same over time (Roberts, 2007).

We have also identified other social cognitive mechanisms taken from life span development that may also facilitate consistency through their buffering effect on life experience (Baltes, Lindenberger, & Staudinger, 2006). For example, in the face of changing or declining skills, people may optimize their remaining strengths and thus avoid the necessity of change. Moreover, people may use different norms for comparison purposes when making self ratings. Certain people may not be as energetic at 70 as at 20, but they may still rate themselves high on energy because compared to their older peers, they are energetic. Also, coping and defense mechanisms may help people to reconfigure information in a way that inoculates them from the necessity of change. Inferring a lack of efficacy and competence because of failure to attain a goal may be put off if the person can attribute responsibility to some external force instead of themselves.

In the sociogenomic model of personality traits the environment clearly plays a role in change, just as was presumed in *Personality and Assessment*, but the tenor of that role is qualitatively different. In the depiction of the situation in social cognitive models, it is presumed that environments play direct and strong roles in determining behavior and presumably then a strong role in determining “personality”. In the sociogenomic model of personality traits we see that the role of environments is to act on the social cognitive level of analysis—thoughts, feelings, and behaviors. But, there is the countervailing force of the trait acting as a brake to the variability in behavior imparted by situational pressures. In turn, the force of the situation on the trait has to be indirect. It acts either through gross physiologic changes or through slow incremental or persistent effects on social cognitive systems (Wood & Roberts, 2006).

The indirect effect of environments and the countervailing force of traits are the primary reason we have hypothesized that the effect of environments on personality trait change is actually quite small (Roberts, 2006b). It is also why we have proposed, somewhat counter-intuitively, that the effect of an environment will be felt at the trait level more if the environment is persistent—that is, the situation does not change over time and therefore provides a constant press to change in a specific direction (Roberts, 2006b). For example, in a longitudinal study of couples, it was found that personality trait change was more likely to occur in intact couples rather than in persons who transitioned between relationships during the longitudinal period of study (Lehnart & Neyer, 2006). This take on the role of situations runs counter to the typical, naïve environmentalism that dominates thinking about the effect of situations that often results in a focus on “transitions” or “life events”. The intrinsic model underlying the focus on transitions and life events presumes a strong effect of a simple environmental change on personality. In contrast, according to the sociogenomic model of traits, personality trait change is much more likely to come about if the situation stays the same for a long time (Roberts, 2006b).

These are just a few of the issues that arise in the study of personality development if we move to a definition of personality traits that successfully blends classic trait and social cognitive ap-

proaches to personality. In this respect, I am bullish about the future of personality development as few if any of these issues has been constructively studied in developmental research. Moreover, this essay has primarily focused on personality traits, but it is also the case that goals, motives, narratives and abilities warrant equal attention in developmental research, which has yet to be achieved.

5. Moving toward a Newtonian personality psychology

In a pointed critique of trait models, the penultimate trait model, the Five Factor approach, was characterized as “Aristotelian” and the social cognitive approach—the derivative of *Personality and Assessment*—was described as “Galilean” (Cervone et al., 2001). The implication was that Big Five trait psychologists are, like the scholars of the middle ages, intellectual dinosaurs unwilling to acknowledge the inevitable progress that was fomented by *Personality and Assessment*. Clearly, through his assiduous study of the actions of moving objects, Galileo did move physics and cosmology forward beyond Aristotle’s expertise. Similarly, *Personality and Assessment* did move the field of personality forward into an embrace of a different set of analytical units, such as goals, schemas, and self-efficacy.

Moving beyond *Personality and Assessment*, one would hope that personality psychology could do better than either an Aristotelian or Galilean perspective. A successful marriage of trait and social cognitive perspectives on personality and personality development brings to mind another intellectual giant—Newton—as an inspiration for a unified personality psychology. Newton took Galileo’s carefully derived observations, formulas, and calculations and summarized them with a nice latent variable—gravity. Identifying gravity as the latent variable behind the movement of objects did not eliminate the elegant observations of Galileo. Physicists still use his formulas to plot the arc of ball thrown through the air, for example. Likewise, with an integrative model of personality traits, a Newtonian personality psychology would be able to move between meticulous observations of social cognition to global traits without having to traverse different theoretical models.

As the sociogenomic model of personality traits exemplifies, the distance between these seemingly disparate perspectives on personality and personality development is strikingly small. Nonetheless, the narcissism of minor differences has been a formidable barrier to reaching some form of consensus in our field. In my mind this is a serious tragedy because we have wasted precious time and intellectual energy with pointless internecine battles. To continue fostering these divisions with the field of personality psychology is simply regressive. Both factions have evidence for the validity of their constructs and view points. This should provide little solace as few psychologists truly try to disconfirm their own models. Both theoretical positions are, in turn, clearly inadequate as evidenced by the study of personality development. A relatively straightforward integration of both perspectives results in a model that is better able to account for the plurality of phenomena that personality psychology engages.

Moreover, personality psychology has important tasks ahead of it and our ability to handle these tasks will be hindered to the extent that rival factions fail to come to terms. The field of psychology faces a huge intellectual challenge in the form of the human genome and the raft of research that will emerge from it. These findings will have profound implications for all of psychology as well as public policy. No field is better equipped to wrestle with the theoretical and empirical implications of this biologic innovation than personality psychology. In addition, many classic issues that deserve greater attention remain unresolved. What are the health implications of personality? Specifically, do personality constructs qualify as epidemiological risk factors? If so, what are the mechanisms responsible for their action? What is the relevance

of personality to human functioning in work and achievement settings (Heckman, Stixrud, & Urzua, 2006)? Can we consider personality variables a third wave beyond socioeconomic status and cognitive ability in the prediction and explanation of achievement? More importantly, how do we develop these “non-cognitive” skills in childhood and adolescence so that more people can succeed in life (Heckman, 2007)? What role does “normal” personality play in psychopathology (Helzer, Kraemer, & Krueger, 2006)? If the clinical world moves to a dimensional model of psychopathology, should personality psychology be ready to inform that dimensional model? And of course, how does personality, in all of its grand glory develop? We have spent several decades obsessing over the heritability of traits, the test–retest stability of personality, and the existence of social cognitive units of analysis and have failed to investigate the long path between genes and the adult personality. Given the importance of personality traits to multiple outcomes, this would seem to be an important topic of investigation.

These are just some of the exciting issues that confront our field. If we continue to argue over the effect of *Personality and Assessment* and its fallout or let the divisions created by Mischel's book persist, it is my fear that personality psychology will lose its way at a moment when it is poised to facilitate so much in terms of science and public policy.

Acknowledgments

This research was supported by Grant AG21178 from the National Institute of Aging. I would like to thank Josh Jackson for helpful comments on earlier drafts of this paper.

References

- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. (1950). *The authoritarian personality*. New York: Harper.
- Allport, G. W. (1961). *Pattern and growth in personality*. New York, NY: Holt, Rinehart and Winston.
- Baltes, P. B. (1997). On the incomplete architecture of human ontogeny. *American Psychologist*, 52, 366–380.
- Baltes, P. B., Lindenberger, U., & Staudinger, U. M. (2006). Life span theory in developmental psychology. In W. Damon & R. M. Lerner (Eds.), *Handbook of Child Psychology. Theoretical Models of Human Development* (Vol. 1, 6th ed. pp. 569–664). New York: Wiley.
- Block, J., & Block, J. H. (2006). Venturing a 30-Year longitudinal study. *American Psychologist*, 61, 315–327.
- Borkenau, P., Mauer, N., Riemann, R., Spinath, F. M., & Angleitner, A. (2004). Thin slices of behavior as cues of personality and intelligence. *Journal of Personality and Social Psychology*, 86, 599–614.
- Bowlby, J. (1980). *Attachment and loss*. New York, NY: Basic Books.
- Cantor, N. (1990). From thought to behavior: “Having” and “doing” in the study of personality and cognition. *American Psychologist*, 45, 735–750.
- Caspi, A., & Bem, D. J. (1990). Personality continuity and change across the life course. In L. Pervin (Ed.), *Handbook of personality theory and research* (1st ed.). New York, NY: The Guilford Press.
- Cervone, D., Shadel, W. G., & Jencius, S. (2001). Social-cognitive theory of personality assessment. *Personality and Social Psychology Review*, 5, 33–51.
- Craik, K. (1969). Personality unvanquished. *Contemporary Psychology*, 14, 147–148.
- Diener, E. (2000). Subjective well-being: The science of happiness, and a proposal for a national index. *American Psychologist*, 55, 34–43.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256–273.
- Ehrenreich, B. (2006). *Boys just want to have fun*. Time Magazine.
- Emmons, R. A., & McAdams, D. P. (1991). Personal strivings and motive dispositions: Exploring the links. *Personality and Social Psychology Bulletin*, 6, 648–654.
- Fleeson, W. (2001). Toward a structure- and process-integrated view of personality: Traits as density distributions of states. *Journal of Personality & Social Psychology*, 80, 1011–1027.
- Funder, D. C. (1991). Global traits: A Neo-Allportian approach to personality. *Psychological Science*, 2, 31–39.
- Funder, D. C. (2008). Personality, situations, and person–situation interactions. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality theory and research* (pp. 568–581). New York, NY: The Guilford Press.
- Funder, D. C., & Colvin, C. R. (1991). Explorations in behavioral consistency: Properties of persons, situations, and behaviors. *Journal of Personality & Social Psychology*, 60, 773–794.
- Funder, D. C., & Ozer, D. J. (1983). Behavior as a function of the situation. *Journal of Personality and Social Psychology*, 44, 107–112.
- Heckman, J. J. (2007). The economics, technology, and neuroscience of human capability formation. *Proceedings of the National Academy of Sciences*, 104, 13250–13255.
- Heckman, J. J., Stixrud, J., & Urzua, S. (2006). The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics*, 24, 411–482.
- Helzer, J. E., Kraemer, H. C., & Krueger, R. F. (2006). The feasibility and need for dimensional psychiatric diagnoses. *Psychological Medicine*, 36, 1671–1680.
- Higgins, E. T., & Scholer, A. A. (2008). When is personality revealed? A motivated cognition approach. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality theory and research* (pp. 182–207). New York, NY: The Guilford Press.
- Johnson, J. A. (1997). Units of analysis for the description and explanation of personality. In Robert Hogan, John A. Johnson, & Briggs Stephen R. (Eds.), *Handbook of personality psychology* (pp. 73–93). San Diego, CA, US: Academic Press.
- Johnson, J. A. (1999). Persons in situations: Distinguishing new wine from old wine in new bottles. *European Journal of Personality*, 13, 443–453.
- Johnson, W., McGue, M., & Krueger, R. F. (2005). Personality stability in late adulthood: A behavioral genetic analysis. *Journal of Personality*, 73, 523–551.
- Lehnart, J., & Neyer, F. J. (2006). Should I stay or should I go? Attachment and personality in stable and instable romantic relationships. *European Journal of Personality*, 20, 475–495.
- Lodi-Smith, J. L., & Roberts, B. W. (2007). Social Investment and Personality: A meta-analytic analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and Social Psychology Review*, 11, 68–86.
- McAdams, D. P. (1994). Can personality change? Levels of stability and growth in the personality across the life span. In T. F. Heatherton & J. L. Weinberger (Eds.), *Can personality change?* (pp. 299–313). Washington, DC, USA: American Psychological Association.
- McAdams, D. P., & Pals, J. L. (2006). A new big five: Fundamental principles for an integrative science of personality. *American Psychologist*, 61, 204–217.
- McCrae, R. R., & Costa, P. T. Jr., (1999). A five-factor theory of personality. In L. A. Pervin & O. P. John's (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 139–153). New York: Guilford.
- McCrae, R. R., & Costa, P. T. Jr., (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality theory and research* (pp. 159–181). New York, NY: The Guilford Press.
- McEwen, B. S., Liston, C., & Morrison, J. H. (2006). Stress-induced structural plasticity in prefrontal cortex, amygdala and hippocampus. *Neuropsychopharmacology*, 31, S13.
- McNiel, J. M., & Fleeson, W. (2006). The causal effects of extraversion on positive affect and neuroticism on negative affect: Manipulating state extraversion and state neuroticism in an experimental approach. *Journal of Research in Personality*, 40, 529–550.
- Mischel, W. (1968). *Personality and assessment*. New York: Wiley.
- Mischel, W., & Peake, P. K. (1982). Beyond déjà vu in the search for cross-situational consistency. *Psychological Review*, 89, 730–755.
- Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102, 246–268.
- Mischel, W., & Shoda, Y. (1998). Reconciling processing dynamics and personality dispositions. *Annual Review of Psychology*, 49, 229–258.
- Moore, J. (2008). Personal communication
- Mroczek, D. K., & Spiro, A. (2003). Modeling intra-individual change in personality traits: Findings from the normative aging study. *Journals of Gerontology: Psychological Sciences*, 58B, 153–165.
- Nezlek, J. B. (2007). A multilevel framework for understanding relationships among traits, states, situations and behaviors. *European Journal of Personality*, 21, 789–810.
- Olweus, D. (1997). Bully/victim problems in school: Facts and intervention. *European Journal of Psychology of Education. Special issue: Children with special needs*, 12, 495–510.
- Ozer, D. J., & Benet-Martinez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology*, 57, 401–421.
- Paul, A. M. (2004). *The cult of personality*. New York, NY: Free Press.
- Roberts, B. W. (2005). Blessings banes and possibilities in the study of childhood personality. *Merrill Palmer Quarterly*, 51, 367–378.
- Roberts, B. W. (2006a). From kindling to conflagration: Self-regulation and personality change. In K. W. Schaie & L. L. Carstensen (Eds.), *Social structures aging and self-regulation in the elderly* (pp. 85–94). New York NY: Springer Publishing Company.
- Roberts, B. W. (2006b). Personality development and organizational behavior. In B. M. Staw (Ed.), *Research on organizational behavior* (pp. 1–41). New York, NY: Elsevier Science/JAI Press.
- Roberts, B. W. (2007). Contextualizing personality psychology. *Journal of Personality*, 75, 1071–1081.
- Roberts, B. W., & Caspi, A. (2003). The cumulative continuity model of personality development: Striking a balance between continuity and change in personality traits across the life course. In R. M. Staudinger & U. Lindenberger (Eds.), *Understanding human development: lifespan psychology in exchange with other disciplines* (pp. 183–214). Dordrecht, NL: Kluwer Academic Publishers.
- Roberts, B.W., Wood, D., Caspi, A. (2008). Personality development. In O.P. John, R.W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: theory and research* (3rd ed., pp. 375–398), New York, NY: Guilford.

- Roberts, B. W., & Jackson, J. J. (2008). Sociogenomic personality psychology. *Journal of Personality*, 76, 1523–1544.
- Roberts, B. W., Kuncel, N., Shiner, R. N., Caspi, A., & Goldberg, L. R. (2007). The power of personality: The comparative validity of personality traits, socio-economic status, and cognitive ability for predicting important life outcomes. *Perspectives in Psychological Science*, 2, 313–345.
- Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science*, 17, 31–35.
- Roberts, B. W., O'Donnell, M., & Robins, R. W. (2004). Goal and personality development. *Journal of Personality and Social Psychology*, 87, 541–550.
- Roberts, B. W., & Pomerantz, E. M. (2004). On traits, situations, and their integration: A developmental perspective. *Personality and Social Psychology Review*, 8, 402–416.
- Roberts, B. W., & Robins, R. W. (2000). Broad dispositions, broad aspirations: The intersection of the Big Five dimensions and major life goals. *Personality and Social Psychology Bulletin*, 26, 1284–1296.
- Roberts, B. W., & Wood, D. (2006). Personality development in the context of the neo-Socioanalytic Model of personality. In D. Mroczek & T. Little (Eds.), *Handbook of personality development* (pp. 11–39). Mahwah, NJ: Lawrence Erlbaum Associates.
- Roberts, B. W., Wood, D., & Smith, J. L. (2005). Evaluating five factor theory and social investment perspectives on personality trait development. *Journal of Research in Personality*, 39, 166–184.
- Steyer, R., Schmitt, M., & Eid, M. (1999). Latent state-trait theory and research in personality and individual differences. *European Journal of Personality*, 13, 389–408.
- Takahashi, Y., Yamagata, S., Kijima, N., Shigemasu, K., Ono, Y., & Ando, J. (2007). Continuity and change in behavioral inhibition and activation systems: A longitudinal behavioral genetic study. *Personality and Individual Differences*, 43, 1616–1625.
- Tellegen, A. (1991). Personality traits: Issues of definition, evidence, and assessment. In *Thinking clearly about psychology: Essays in honor of Paul E. Meehl*. In D. Cicchetti & W. M. Grove (Eds.), *Personality and psychopathology* (Vol. 2, pp. 6–9). Minneapolis, MN, US: University of Minnesota Press.
- Terracciano, A., McCrae, R. R., & Costa, P. T. Jr., (2006). Longitudinal trajectories in Guilford–Zimmerman temperament survey data: Results from the Baltimore longitudinal study of aging. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences*, 61, 108–116.
- Wiggins, J. S. (1997). In defense of traits. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of Personality Psychology* (pp. 95–115). San Diego, CA: Academic Press.
- Wood, D., & Roberts, B. W. (2006). Cross-sectional and longitudinal tests of the personality and role identity structural model (PRISM). *Journal of Personality*, 74, 779–809.
- Zuckerman, M., & Kuhlman, D. (1993). *Norms for the Zuckerman–Kuhlman Personality Questionnaire (ZKPQ)*. Unpublished manuscript.