Five-Factor Model of Personality

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Introduction

The five-factor model of personality (FFM) is a set of five broad trait dimensions or domains, often referred to as the "Big Five": Extraversion, Agreeableness, Conscientiousness, Neuroticism (sometimes named by its polar opposite, Emotional Stability), and Openness to Experience (sometimes named Intellect). Highly extraverted individuals are assertive and sociable, rather than quiet and reserved. Agreeable individuals are cooperative and polite, rather than antagonistic and rude. Conscientious individuals are task-focused and orderly, rather than distractible and disorganized. Neurotic individuals are prone to experiencing negative emotions, such as anxiety, depression, and irritation, rather than being emotionally resilient. Finally, highly open individuals have a broad rather than narrow range of interests, are sensitive rather than indifferent to art and beauty, and prefer novelty to routine. The Big Five/FFM was developed to represent as much of the variability in individuals' personalities as possible, using only a small set of trait dimensions. Many personality psychologists agree that its five domains capture the most important, basic individual differences in personality traits and that many alternative trait models can be conceptualized in terms of the Big Five/FFM structure. The goal of this article is to reference, organize, and comment on a variety of classic and contemporary papers related to the Big Five/FFM. This article begins with papers that introduce the Big Five/FFM structure, approach it from different theoretical perspectives, and consider possible objections to it (General Overviews, Theoretical Perspectives, and Critiques). Next, it discusses papers providing evidence for the Big Five/FFM as a model of basic trait structure (Big Five/FFM Structure). Third, the article considers hierarchical trait models that propose even broader personality dimensions "above" the Big Five, or more-specific traits "beneath" the Big Five (Big Five/FFM in Hierarchical Context). Fourth, it references a series of handbook chapters that each consider an individual Big Five domain in depth (Individual Domains). Fifth, it references several widely used Big Five/FFM measures as well as papers examining the accuracy of Big Five self-reports and observer-reports (Measurement). Sixth, the article discusses the biological and social origins of the Big Five (Biological and Social Bases). Seventh, the article considers stability and change in the Big Five across the life span as well as the developmental mechanisms underlying stability and change (Development). Finally, this article cites evidence that the Big Five influences a variety of important behaviors and life outcomes, from political attitudes to psychopathology (Predicting Behaviors and Life Outcomes).

General Overviews

These papers introduce the Big Five/five-factor model of personality (FFM) structure. Digman 1990 and Goldberg 1993 focus on its historical development. McCrae and John 1992 considers its possible theoretical and practical applications. John, et al. 2008 reviews a variety of research, including studies connecting the Big Five with important behaviors and life outcomes. The Great Ideas in Personality website briefly reviews the Big Five/FFM and provides links to other relevant online resources.

Digman, John M. 1990. Personality structure: Emergence of the five-factor model. *Annual Review of Psychology* 41.1: 417–440.

This article summarizes the history of the Big Five/FFM structure, including its relation to earlier personality models. It also reviews research relating the Big Five to behavior.

Goldberg, Lewis R. 1993. The structure of phenotypic personality traits. *American Psychologist* 48.1: 26–34.

This article reviews the history of the Big Five/FFM structure, from Galton's 1884 preliminary lexical work to the emergence of a consensus among personality psychologists more than a century later.

Great ideas in personality: Five-factor model.

This web page briefly reviews the Big Five/FFM structure, summarizes its relations to other personality models, and provides links to relevant online resources.

John, Oliver P., Laura P. Naumann, and Christopher J. Soto. 2008. Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In *Handbook of personality: Theory and research*. **3d ed. Edited by Oliver P. John, Richard W. Robins, and Lawrence A. Pervin, 114–158. New York: Guilford.**

This chapter provides a broad overview of the Big Five/FFM structure. It summarizes the history of the model, reviews research on the lifespan development and predictive validity of the Big Five, and discusses a variety of conceptual and measurement issues.

McCrae, Robert R., and Oliver P. John. 1992. An introduction to the five-factor model and its applications. *Journal of Personality* **60.2: 175–215.**

This article reviews the history of the Big Five/FFM structure, objections to it, conceptualizations of the five domains, and possible theoretical and practical applications.

Theoretical Perspectives

The Big Five/five-factor model of personality (FFM) structure is sometimes criticized for being developed empirically rather than theoretically. The papers in this section interpret the Big Five from a variety of theoretical viewpoints, including biological (McCrae and Costa 2008), social (Ashton and Lee 2001, Hogan 1996), and motivational (Denissen and Penke 2008) perspectives.

Ashton, Michael C., and Kibeom Lee. 2001. A theoretical basis for the major dimensions of personality. *European Journal of Personality* **15.5: 327–353.**

This article proposes that Agreeableness and Neuroticism represent key dimensions of prosocial versus antisocial behavior. It proposes that Extraversion, Conscientiousness, and Openness to Experience represent engagement with social, task-focused, and intellectual goals, respectively.

Denissen, Jaap J. A., and Lars Penke. 2008. Motivational individual reaction norms underlying the five-factor model of personality: First steps towards a theory-based conceptual framework. *Journal of Research in Personality* **42.5: 1285–1302.**

This article proposes that the Big Five reflect motivational responses to specific types of situations. Specifically, it conceptualizes Extraversion as reward sensitivity in social situations, Agreeableness as motivation to cooperate versus compete when resources are scarce, Conscientiousness as motivation to pursue goals despite obstacles or distractions, Neuroticism as punishment sensitivity in response to social exclusion, and Openness to Experience as reward sensitivity while engaged in cognitive activity.

Hogan, Robert. 1996. A socioanalytic perspective on the five-factor model. In *The five-factor model of personality: Theoretical perspectives*. **Edited by Jerry S. Wiggins, 163–179. New York: Guilford.**

This chapter proposes that the Big Five are innate categories of human perception that have evolved because of their usefulness for predicting social behavior. In this view, a person's standing on the Big Five represents the key aspects of their social reputation.

McCrae, Robert R., and Paul T. Costa Jr. 2008. The Five-Factor Theory of personality. In *Handbook of personality: Theory and research*. **3d ed. Edited by Oliver P. John, Richard W. Robins, and Lawrence A. Pervin, 159–181. New York: Guilford.**

This chapter conceptualizes the Big Five as biologically rooted basic tendencies that influence individuals' characteristic adaptations to their environments, including their goals, attitudes, and self-concepts.

Critiques

Consensus around the Big Five/five-factor model of personality (FFM) structure has grown steadily since the early 1990s. However, researchers and theorists have also criticized the model on various grounds. Block 1995 and McAdams 1992 raise empirical and theoretical objections. Ashton and Lee 2007 proposes an alternative, six-dimensional model.

Ashton, Michael C., and Kibeom Lee. 2007. Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review* 11.2: 150–166.

This article argues that the Big Five/FFM structure should be revised to accommodate a sixth broad trait domain: Honesty-Humility. It summarizes evidence for the resulting six-dimensional structure and interprets these dimensions in terms of key evolutionary tasks.

Block, Jack. 1995. A contrarian view of the five-factor approach to personality description. *Psychological Bulletin* 117.2: 187–215.

This article raises several objections to the Big Five/FFM structure, including concerns about the lexical hypothesis, the statistical technique of factor analysis, and questionnaire measures of the Big Five.

McAdams, Dan P. 1992. The five-factor model in personality: A critical appraisal. *Journal of Personality* 60.2: 329–361.

This article highlights several conceptual, methodological, and empirical objections to the Big Five/FFM structure. It argues that the Big Five are useful for summarizing basic information about someone's personality traits but not for understanding their personality with much detail, depth, or context.

The Big Five/FFM Structure

Evidence for the Big Five/five-factor model of personality (FFM) structure comes from two main sources. The first is lexical research. The lexical hypothesis proposes that the most universally important personality traits will become encoded as words in some or all languages, because people will need to communicate about them. Lexical studies conducted in several languages have recovered versions of the Big Five/FFM structure from personality ratings made using sets of trait-descriptive adjectives. The second source of evidence is research showing that the traits assessed by many personality inventories can be conceptualized in terms of the Big Five. The papers in this section present both types of evidence.

EARLY LEXICAL RESEARCH

The papers in this section represent important early steps in the development of the Big Five/FFM structure. They begin with Galton's preliminary lexical research (Galton 1884), which was continued in Allport and Odbert 1936. They end with empirical studies such as Fiske 1949, Norman 1963, and Tupes and Christal 1992 that recovered versions of the Big Five/FFM structure in personality ratings made using a set of American English synonym clusters developed in Cattell 1945.

Allport, Gordon W., and Henry S. Odbert. 1936. Trait-names: A psycho-lexical study. *Psychological Monographs* 47.1: 1–171.

This ambitious study reviewed an unabridged English dictionary and extracted every term that could be used to "distinguish the behavior of one human being from that of another" (p. 24). The resulting list of 17,953 terms served as a starting point for further lexical research.

Cattell, Raymond B. 1945. The description of personality: Principles and findings in a factor analysis. *American Journal of Psychology* **58.1: 69–90.**

This study developed thirty-five synonym clusters from Allport and Odbert's extensive list of trait-descriptive terms (Allport and Odbert 1936). Later analyses of personality ratings made using these synonym clusters provided initial evidence for the Big Five/FFM structure.

Fiske, Donald W. 1949. Consistency of the factorial structures of personality ratings from different sources. *Journal of Abnormal and Social Psychology* **44.3: 329–344.**

This study recovered versions of the Big Five/FFM structure from personality self-ratings, peer-ratings, and observer ratings made using a subset of Cattell's synonym clusters. This finding was the first occurrence of the Big Five/FFM structure.

Galton, Francis. 1884. Measurement of character. *Fortnightly Review* **36:179–185.**

This article argues that personality or character traits can and should be measured. It includes perhaps the first application of the lexical hypothesis to understanding personality: Galton sampled pages from an English dictionary and estimated that it contained at least a thousand trait-descriptive terms.

Norman, Warren T. 1963. Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology* **66.6: 574–583.**

This article recovered the Big Five from personality peer-ratings of several student samples made using a subset of Cattell's synonym clusters.

Tupes, Ernest C., and Raymond E. Christal. 1992. Recurrent personality factors based on trait ratings. *Journal of Personality* **60.2: 225–251.**

Originally published in 1961 as an Air Force technical report, this paper recovered the Big Five from several samples of personality self-ratings and peer-ratings, made using subsets of Cattell's synonym clusters. This was perhaps the most compelling early demonstration of the Big Five/FFM structure's replicability.

CONTEMPORARY LEXICAL RESEARCH

Interest in personality traits began to wane in the late 1960s as personality and social psychologists began a decades-long debate about the importance of trait versus situational influences on behavior. By the 1980s, however, several researchers had resumed lexical work. Capitalizing on advances in computing power, these researchers analyzed personality ratings made using much larger sets of trait-descriptive adjectives than had been previously possible. They recovered versions of the Big Five/FFM structure in American English (Goldberg 1990), Dutch and German (Hofstee, et al. 1997), and a variety of other languages (Saucier and Goldberg 2001), sparking initial consensus around this structure. Saucier and Goldberg 1998 searched for, but failed to find, additional broad trait dimensions beyond the Big Five. Recently, De Raad, et al. 2010 questioned the cross-cultural generalizability of some Big Five domains.

De Raad, Boele, Dick P. H. Barelds, Eveline Levert, et al. 2010. Only three factors of personality description are fully replicable across languages: A comparison of 14 trait taxonomies. *Journal of Personality and Social Psychology* **98.1: 160–173.**

This article compares the results of lexical studies conducted in twelve languages. It finds versions of Extraversion, Agreeableness, and Conscientiousness in almost all languages, versions of Neuroticism in most languages, and substantial variability in the content of the fifth factor across languages.

Goldberg, Lewis R. 1990. An alternative "description of personality": The Big-Five factor structure. *Journal of Personality and Social Psychology* **59.6: 1216–1229.**

This article recovers versions of the Big Five/FFM structure from personality self-ratings and peer-ratings made using sets of up to 1,431 American English trait adjectives. These findings helped spark consensus around the Big Five/FFM structure.

Hofstee, Willem K. B., Henk A. Kiers, Boele de Raad, and Lewis R. Goldberg. 1997. A comparison of Big-Five structures of personality traits in Dutch, English, and German. *European Journal of Personality* **11.1: 15–31.**

This article compares the results of the first three contemporary, large-scale lexical studies. These studies were conducted in American English, Dutch, and German, and each analyzed personality ratings made using hundreds of trait-descriptive adjectives. All three studies recovered versions of the Big Five, except for Openness to Experience in the Dutch study.

Saucier, Gerard, and Lewis R. Goldberg. 1998. What is beyond the Big Five? *Journal of Personality* **66.4: 495–524.**

This study searches for clusters of person-descriptive adjectives that are independent from the Big Five domains. It identifies religiousness, height, girth, age, employment status, and negative evaluation terms as relatively independent clusters.

Saucier, Gerard, and Lewis R. Goldberg. 2001. Lexical studies of indigenous personality factors: Premises, products, and prospects. *Journal of Personality* **69.6: 847–880.**

This article reviews lexical studies conducted in thirteen languages, identifying important similarities and differences in their findings. It also highlights two unresolved issues in lexical research: identifying more-specific personality traits "beneath" the Big Five domains, and understanding how variable selection affects factor analysis results.

PERSONALITY INVENTORY RESEARCH

The papers in this section focus on the second key source of evidence for the Big Five/FFM structure: research conducted using personality inventories. This research (e.g., McCrae and Costa 1989) has shown that the traits measured by many personality inventories can be conceptualized in terms of the Big Five. McCrae and Costa 1987, McCrae and Costa 1997, and McCrae, et al. 2005 show that the Big Five/FFM structure can be recovered from inventories administered in American English and a variety of other languages and cultures.

McCrae, Robert R., and Paul T. Costa Jr. 1987. Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology* **52.1: 81–90.**

This study recovers versions of the Big Five/FFM structure from personality self-ratings and peer-ratings on two measures: a set of trait-descriptive adjectives and a personality inventory. It also shows strong convergence between these two measures. These findings helped integrate evidence for the Big Five/FFM structure from lexical and inventory-based research.

McCrae, Robert R., and Paul T. Costa Jr. 1989. Reinterpreting the Myers-Briggs Type Indicator from the perspective of the five-factor model of personality. *Journal of Personality* **57.1: 17–40.**

Across the 1980s and 1990s, McCrae, Costa, and their colleagues conducted an extensive program of research showing that the traits measured by many personality inventories can be conceptualized in terms of the Big Five. This article reports an example of this research.

McCrae, Robert R., and Paul T. Costa Jr. 1997. Personality trait structure as a human universal. *American Psychologist* **52.5: 509–516.**

This study recovers versions of the Big Five/FFM structure from self-ratings, in seven languages, on the Revised NEO Personality Inventory (NEO PI-R; see also Costa and McCrae 1992, cited under Measures). These results support the cross-cultural generalizability of the Big Five/FFM structure.

McCrae, Robert R., Antonio Terracciano, and 78 members of the Personality Profiles of Cultures Project. 2005. Universal features of personality traits from the observer's perspective: Data from 50 cultures. *Journal of Personality and Social Psychology* **88.3: 547–561.**

This study analyzes personality peer-reports made by members of fifty cultures using translations of the NEO PI-R (see also Costa and McCrae 1992, cited under Measures). It finds similar factor structures, age differences, and gender differences across most cultures, further supporting the cross-cultural generalizability of the Big Five/FFM structure.

The Big Five/FFM in Hierarchical Context

Personality traits can be conceptualized hierarchically, with broader traits (e.g., Extraversion) subsuming narrower ones (e.g., assertiveness, sociability). The papers in this section view the Big Five in terms of hierarchical trait models.

HIGHER-ORDER FACTORS

Some evidence suggests that the Big Five can be combined to define even broader constructs. DeYoung 2006, Digman 1997, and Markon, et al. 2005 provide evidence for such higher-order factors "above" the Big Five. Ashton, et al. 2009, however, argues against the existence of higher-order factors.

Ashton, Michael C., Kibeom Lee, Lewis R. Goldberg, and Reinout E. de Vries. 2009. Higher order factors of personality: Do they exist? *Personality and Social Psychology Review* **13.2: 79–91.**

This article proposes that observed correlations among the Big Five do not necessarily indicate the existence of higher-order factors. Instead, they may reflect the presence of lower-order variables that blend content from two or more orthogonal Big Five domains.

DeYoung, Colin G. 2006. Higher-order factors of the Big Five in a multi-informant sample. *Journal of Personality and Social Psychology* **91.6: 1138–1151.**

This article recovers two higher-order factors, similar to those found in Digman 1997, in analyses of personality self-ratings and peer-ratings made using two Big Five/five-factor model of personality (FFM) measures. It proposes that these factors reflect two fundamental human concerns: maintaining a stable organization to psychosocial functioning (stability), and incorporating new information into that organization (plasticity).

Digman, John M. 1997. Higher-order factors of the Big Five. *Journal of Personality and Social Psychology* **73.6: 1246–1256.**

This article was the first to show that correlations among the Big Five domains suggest the existence of two higher-order factors. It proposes that one factor, defined by Agreeableness, Conscientiousness, and (low) Neuroticism, reflects the influence of socialization experiences on personality, whereas the second factor, defined by Extraversion and Openness to Experience, reflects the influence of personal growth experiences.

Markon, Kristian E., Robert F. Krueger, and David Watson. 2005. Delineating the structure of normal and abnormal personality: An integrative hierarchical approach. *Journal of Personality and Social Psychology* **88.1: 139–157.**

This article replicates two-, three-, four-, and five-factor structures across a meta-analysis and an empirical study, using several measures of normal and abnormal personality traits. Its findings indicate that a variety of "Big Trait" models, including the Big Five/FFM, can be integrated within a single hierarchical structure.

LOWER-ORDER TRAITS

Each broad Big Five domain subsumes a number of more-specific traits that are related to each other, but also distinguishable. Such traits are often referred to as "facets" of the Big Five. The papers included in this section discuss ways to identify, conceptualize, and measure facet traits "beneath" the Big Five. Hofstee, et al. 1992 and Saucier and Ostendorf 1999 extend the lexical approach to the facet level. Costa and McCrae 1995, DeYoung, et al. 2007, and Roberts, et al. 2005 identify facet traits by analyzing personality inventories.

Costa, Paul T., Jr., and Robert R. McCrae. 1995. Domains and facets: Hierarchical personality assessment using the Revised NEO Personality Inventory. *Journal of Personality Assessment* **64.1: 21–50.**

This article describes the development of the thirty NEO PI-R facet scales (see Costa and McCrae 1992, cited under Measures) and presents evidence for their discriminant validity. It also discusses general issues related to the conceptualization and measurement of trait hierarchies.

DeYoung, Colin G., Lena C. Quilty, and Jordan B. Peterson. 2007. Between facets and domains: 10 aspects of the Big Five. *Journal of Personality and Social Psychology* **93.5: 880–896.**

This article identifies two subcomponents of each Big Five domain based on factor analyses of the seventy-five facet scales from two Big Five/FFM measures. These ten "aspects" represent a middle ground between the broad Big Five domains and more-specific facet traits.

Hofstee, Willem K., Boele de Raad, and Lewis R. Goldberg. 1992. Integration of the Big Five and circumplex approaches to trait structure. *Journal of Personality and Social Psychology* **63.1: 146–163.**

This article forms ten circumplexes from pairs of Big Five domains. It then uses these circumplexes to define forty-five facet traits as blends of the Big Five.

Roberts, Brent W., Oleksandr S. Chernyshenko, Stephen Stark, and Lewis R. Goldberg. 2005. The structure of conscientiousness: An empirical investigation based on seven major personality questionnaires. *Personnel Psychology* **58.1: 103–139.**

Employing a strategy similar to DeYoung, et al. 2007, but focusing on a single Big Five domain, this study identifies six facets of Conscientiousness based on factor analyses of scales from seven personality inventories. It then provides evidence for these facets' convergent, discriminant, and predictive validity.

Saucier, Gerard, and Fritz Ostendorf. 1999. Hierarchical subcomponents of the Big Five personality factors: A cross-language replication. *Journal of Personality and Social Psychology* **76.4: 613–627.**

Adopting a lexical approach, this article identifies eighteen facet traits that replicate across personality ratings made using large sets of American English and German trait-descriptive adjectives.

The five papers in this section are chapters from the *Handbook of individual differences in social behavior*, edited by Leary and Hoyle (New York: Guilford). Each chapter provides an excellent overview of a particular Big Five domain: Extraversion (Wilt and Revelle 2009), Agreeableness (Graziano and Tobin 2009), Conscientiousness (Roberts, et al. 2009), Neuroticism (Widiger 2009), and Openness to Experience (McCrae and Sutin 2009).

Graziano, William G., and Renee M. Tobin. 2009. Agreeableness. In *Handbook of individual differences in social behavior*. Edited by Mark R. Leary and Rick H. Hoyle, 46–61. New York: Guilford.

This chapter defines Agreeableness as the extent to which an individual is likeable, pleasant, and harmonious in relationships with others. It discusses ways to conceptualize and measure Agreeableness and reviews this domain's relations with interpersonal behavior, emotion, and motivation.

McCrae, Robert R., and Angelina R. Sutin. 2009. Openness to experience. In *Handbook of individual differences in social behavior*. Edited by Mark R. Leary and Rick H. Hoyle, 257–273. New York: Guilford.

This chapter defines Openness to Experience as the extent to which an individual is imaginative, sensitive to art and beauty, behaviorally flexible, and intellectually curious, as well as the extent to which he or she experiences complex emotions and has liberal values. It reviews this domain's relations to social interactions, work behaviors and outcomes, social and political attitudes, and culture.

Roberts, Brent W., Joshua J. Jackson, Jennifer V. Fayard, Grant Edmonds, and Jenna Meints. 2009. Conscientiousness. In *Handbook of individual differences in social behavior*. Edited by Mark R. Leary and Rick H. Hoyle, 369–381. New York: Guilford.

This chapter defines Conscientiousness as the extent to which an individual tends to control their impulses, pursue goals, plan ahead, delay gratification, and follow norms and rules. It reviews this domain's relations to behavior, emotion, motivation, and social cognition.

Widiger, Thomas A. 2009. Neuroticism. In *Handbook of individual differences in social behavior*. Edited by Mark R. Leary and Rick H. Hoyle, 129–146. New York: Guilford.

This chapter defines Neuroticism as the extent to which an individual tends to experience negative emotional states, such as anxiety, anger, guilt, and depression. It discusses ways to conceptualize and measure Neuroticism and reviews this domain's origins and relations to life outcomes.

Wilt, Joshua, and William Revelle. 2009. Extraversion. In *Handbook of individual differences in social behavior*. Edited by Mark R. Leary and Rick H. Hoyle, 27–45. New York: Guilford.

This chapter defines Extraversion as the extent to which an individual is bold, assertive, and talkative. It discusses ways to conceptualize and measure Extraversion and reviews this domain's relations to affect, behavior, cognition, motivation, and psychopathology.

Measurement

What is the best way to measure the Big Five? The papers in this section describe the development and validation of several popular measures and examine the accuracy of Big Five self-ratings versus observer ratings.

MEASURES

As consensus around the Big Five/five-factor model of personality (FFM) structure has grown, researchers have developed a variety of instruments to measure its five domains. The papers in this section present several widely used and well-validated measures. Goldberg

1992 and Saucier 1994 use a lexical approach to develop sets of marker adjectives. Costa and McCrae 1992 and Soto and John 2009 present hierarchically structured personality inventories that assess more-specific facet traits within each broad Big Five domain. Gosling, et al. 2003 develops and validates a brief measure with only ten items.

Costa, Paul T., Jr., and Robert R. McCrae. 1992. *Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI): Professional manual*. Odessa, FL: Psychological Assessment Resources.

The Revised NEO Personality Inventory (NEO PI-R) and the NEO Five-Factor Inventory (NEO-FFI) are two of the most widely used Big Five/FFM measures. The sixty-item NEO-FFI assesses the five domains; the longer, 240-item NEO PI-R also assesses thirty facet traits. This manual discusses these measures' conceptualization, development, validation, and applications.

Goldberg, Lewis R. 1992. The development of markers for the Big-Five factor structure. *Psychological Assessment* 4.1: 26–42.

This article describes the development and initial validation of unipolar (one hundred items) and bipolar (fifty items) adjective sets to measure the Big Five domains.

Goldberg, Lewis R. 1999. A broad-bandwidth, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In *Personality psychology in Europe*. Vol. 7, *Selected papers from the Eighth European Conference on Personality held in Ghent, Belgium, July 1996*. Edited by Ivan Mervielde, Ian Deary, Filip De Fruyt, and Fritz Ostendorf, 7–28. Tilburg, the Netherlands: Tilburg Univ. Press.

This chapter describes the development of the International Personality Item Pool (IPIP)—a set of public-domain questionnaire items—and of IPIP scales to measure the Big Five domains and more-specific facet traits. More information, including item text and scoring instructions, is available from the IPIP website.

Gosling, Samuel D., Peter J. Rentfrow, and William B. Swann. 2003. A very brief measure of the Big-Five personality domains. *Journal of Research in Personality* 37.6: 504–528.

This article describes the development and initial validation of the Ten-Item Personality Inventory (TIPI), a very brief measure of the Big Five that can be completed in about one minute. Compared with longer inventories, the TIPI is very efficient but necessarily sacrifices some reliability and validity.

Saucier, Gerard. 1994. Mini-Markers: A brief version of Goldberg's unipolar Big-Five markers. *Journal of Personality Assessment* 63.3: 506–516.

This article describes the development and initial validation of the Mini-Markers, a set of forty adjectives selected from Goldberg's larger set of hundred unipolar Big Five markers (Goldberg 1992). This shorter adjective set retains very good measurement properties.

Soto, Christopher J., and Oliver P. John. 2009. Ten facet scales for the Big Five Inventory: Convergence with NEO PI-R facets, self-peer agreement, and discriminant validity. *Journal of Research in Personality* 43.1: 84–90.

The forty-four-item Big Five Inventory (BFI; see also John, et al. 2008, cited under General Overviews) is a widely used and relatively brief Big Five/FFM measure. This article describes the development and initial validation of BFI scales to measure ten more-specific facet traits.

SELF AND OTHER JUDGMENTS

If you want an accurate description of someone's personality, whom should you ask: the person themselves or someone else who knows them? The papers in this section examine accuracy and bias in Big Five self-ratings and observer ratings. Supporting the

accuracy of such ratings, Funder, et al. 1995 shows considerable self-observer and interobserver agreement. In contrast, Paulhus and John 1998 shows that two distinct biases influence personality self-ratings. Integrating and extending previous research on accuracy and bias, Connelly and Ones 2010 and Vazire 2012 identify the conditions under which personality ratings do and do not accurately predict behavior.

Connelly, Brian S., and Deniz S. Ones. 2010. An other perspective on personality: Meta-analytic integration of observers' accuracy and predictive validity. *Psychological Bulletin* 136.6: 1092–1122.

This article reports a series of three meta-analyses examining the accuracy of Big Five observer ratings. The results show lower accuracy for traits high in evaluativeness (e.g., Agreeableness) and low in visibility (e.g., Neuroticism, Openness to Experience). They also show that Big Five observer ratings predict many behavioral criteria at least as well as self-ratings do.

Funder, David C., David C. Kolar, and Melinda C. Blackman. 1995. Agreement among judges of personality: Interpersonal relations, similarity, and acquaintanceship. *Journal of Personality and Social Psychology* 69.4: 656–672.

This article shows considerable self-observer and inter-observer agreement for personality ratings made in terms of the Big Five. Observers agreed with each other even when they knew the person being rated from different contexts (e.g., hometown versus college friends), and even when they had never met each other, providing evidence for personality consistency across situations.

Paulhus, Delroy L., and Oliver P. John. 1998. Egoistic and moralistic biases in self-perception: The interplay of self-deceptive styles with basic traits and motives. *Journal of Personality* 66.6: 1025–1060.

This article shows that discrepancies between Big Five self-ratings and observer ratings cluster along two dimensions: an egoistic bias defined by overly positive self-perceptions on Extraversion and Openness, and a moralistic bias defined by overly positive self-perceptions on Agreeableness and Conscientiousness. It links the egoistic bias to valuing agency and power and links the moralistic bias to valuing communion and approval from others.

Vazire, Simine. 2012. Who knows what about a person? The self-other knowledge asymmetry (SOKA) model. *Journal of Personality and Social Psychology* 98.2: 281–300.

This study compares the usefulness of personality self-ratings versus observer ratings for predicting behavior. It shows that self-ratings are more accurate for traits with low evaluativeness (e.g., Extraversion, Neuroticism) than for traits with high evaluativeness (e.g., intellect), whereas observer ratings are more accurate for traits with high observability (e.g., Extraversion) than for traits with low observability (e.g. Neuroticism).

Biological and Social Bases

What are the biological and social origins of the Big Five? The papers in this section consider a variety of influences, including genes, evolution, biological temperament, culture, and historical period.

GENETICS

A considerable body of research shows that the Big Five are substantially influenced by both genetic and environmental factors. The papers in this section report and review this evidence and also highlight unresolved issues. Riemann, et al. 1997 and Borkenau, et al. 2001 test the influences of genes, shared family environment, and unshared environment on the Big Five domains. Jang, et al. 1998 provides evidence that the more-specific facet traits within each domain are influenced by unique genetic factors. Terracciano, et al. 2010 searches for specific gene polymorphisms that influence each Big Five domain. Finally, Bouchard and Loehlin 2001 interprets genetic influences on personality from an evolutionary perspective.

Borkenau, Peter, Rainer Riemann, Alois Angleitner, and Frank M. Spinath. 2001. Genetic and environmental influences on observed personality: Evidence from the German observational study of adult twins. *Journal of Personality and Social Psychology* **80.4: 655–668.**

This behavioral genetics study analyzes Big Five observer ratings made after watching the target person's behavior in several situations. In contrast with research using self-ratings and peer-ratings, it finds that most of the Big Five are substantially influenced by the shared environment—environmental factors that cause people raised in the same household to develop similar traits.

Bouchard, Thomas J., Jr., and John C. Loehlin. 2001. Genes, evolution, and personality. *Behavior Genetics* **31.3: 243–273.**

This article reviews evidence for genetic influences on the Big Five and interprets these influences from an evolutionary perspective. It then discusses several unresolved issues, such as understanding the unshared environment, the molecular genetics of personality, and the biological mechanisms underlying relations among personality traits, attitudes, values, interests, and psychopathology.

Jang, Kerry L., Robert R. McCrae, Alois Angleitner, Rainer Riemann, and W. John Livesley. 1998. Heritability of facet-level traits in a cross-cultural twin sample: Support for a hierarchical model of personality. *Journal of Personality and Social Psychology* **74.6: 1556–1565.**

This behavioral genetics study shows that both genes and the environment influence not only the broad Big Five domains but also more-specific facet traits. Furthermore, it shows that many facets are influenced by unique genetic factors that are at least somewhat distinct from genetic influences on the five domains.

Riemann, Rainer, Alois Angleitner, and Jan Strelau. 1997. Genetic and environmental influences on personality: A study of twins reared together using the self– and peer-report NEO-FFI scales. *Journal of Personality* **65.3: 449–476.**

This behavioral genetics study shows that aggregating personality self-ratings and peer-ratings substantially increases heritability estimates for the Big Five. This finding indicates that some of the personality variance typically attributed to unshared environmental influences actually reflects measurement error.

Terracciano, Antonio, Serena Sanna, Manuela Uda, et al. 2010. Genome-wide association scan for five major dimensions of personality. *Molecular Psychiatry* **15.6: 647–656.**

This molecular genetics study tests for associations between the Big Five and more than 350,000 gene polymorphisms. It finds several substantial gene-trait associations in an initial sample, but most of these fail to generalize across three replication samples. These results suggest that individual genes do not have large, simple, additive effects on personality traits.

OTHER BIOLOGICAL INFLUENCES

Genetics research is not the only source of evidence for biological influences on the Big Five. The papers in this section consider a variety of additional evidence, including research on brain functioning (Canli, et al. 2001), biological temperament (Clark and Watson 2008), personality in nonhuman animals (Gosling and John 1999), and cross-cultural consistencies in personality structure and development (McCrae, et al. 2000).

Canli, Turhan, Zuo Zhao, John E. Desmond, Eunjoo Kang, James Gross, and John D. Gabrieli. 2001. An fMRI study of personality influences on brain reactivity to emotional stimuli. *Behavioral Neuroscience* **115.1: 33–42.**

This brain imaging study finds that more-extraverted individuals show greater localized brain reactivity to positive emotional stimuli, whereas more-neurotic individuals show greater reactivity to negative stimuli.

Clark, Lee Anna, and David Watson. 2008. Temperament: An organizing paradigm for trait psychology. In *Handbook of personality: Theory and research*. 3d ed. Edited by Oliver P. John, Richard W. Robins, and Lawrence A. Pervin, 265–286. New York: Guilford.

This chapter proposes a "Big Three" structure of biological temperament—extraversion/positive emotionality, neuroticism/negative emotionality, and disinhibition versus constraint—and discusses how these temperamental traits relate with the Big Five. It then reviews evidence regarding their origin, development, and relations with behavior, life outcomes, and psychopathology.

Gosling, Samuel D., and Oliver P. John. 1999. Personality dimensions in nonhuman animals: A cross-species review. *Current Directions in Psychological Science* 8.3: 69–75.

This article reviews studies of personality traits in a dozen nonhuman species. It concludes that versions of Extraversion, Neuroticism, and Agreeableness can be observed in many species, versions of Openness to Experience in some, and versions of Conscientiousness in almost none.

McCrae, Robert R., Paul T. Costa Jr., Fritz Ostendorf, et al. 2000. Nature over nurture: Temperament, personality, and life span development. *Journal of Personality and Social Psychology* 78.1: 173–186.

This article reviews multiple lines of evidence for biological influences on the Big Five. It argues that the Big Five should be conceptualized as biologically based temperamental traits that develop independently from environmental influences.

SOCIAL INFLUENCES

Personality traits are influenced by social factors as well as biological ones. Costa, et al. 2001 and McCrae, et al. 1998 examine cultural influences on the Big Five. Twenge 2000 and Twenge 2001 test whether historical changes have affected Extraversion and Neuroticism.

Costa, Paul T., Jr., Antonio Terracciano, and Robert R. McCrae. 2001. Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology* 81.2: 322–331.

This study shows some consistent gender differences in the Big Five domains and more-specific facet traits across twenty-six cultures. Interestingly, however, gender differences in personality tended to be larger in cultures with smaller gender differences in social status.

McCrae, Robert R., Michelle S. M. Yik, Paul D. Trapnell, Michael H. Bond, and Delroy L. Paulhus. 1998. Interpreting personality profiles across cultures: Bilingual, acculturation, and peer rating studies of Chinese undergraduates. *Journal of Personality and Social Psychology* 74.4: 1041–1055.

This article examines differences in the Big Five domains and more-specific facet traits among native Canadians of European ancestry, native Canadians of Chinese ancestry, and Chinese immigrants to Canada. It shows that degree of exposure to Canadian culture influenced personality traits.

Twenge, Jean M. 2000. The age of anxiety? The birth cohort change in anxiety and neuroticism, 1952–1993. *Journal of Personality and Social Psychology* 79.6: 1007–1021.

A pair of meta-analyses show that from the 1950s into the 1990s, average levels of Neuroticism increased substantially among American children and college students. These cohort differences corresponded with historical changes in divorce rates, crime rates, and other social indicators, suggesting historical influences on the development of Neuroticism.

Twenge, Jean M. 2001. Birth cohort changes in extraversion: A cross-temporal meta-analysis, 1966–1993. *Personality and Individual Differences* 30.5: 735–748.

This meta-analysis shows that from the 1960s into the 1990s, average levels of Extraversion also increased substantially among American college students.

Development

Although people's personalities tend to be quite stable across short time intervals, they can change considerably over the course of several years or decades. The readings in this section consider evidence about whether, when, and why the Big Five traits develop across the lifespan. Caspi, et al. 2005 and Roberts, et al. 2008 provide broad overviews of research on personality development. McCrae and Costa 2003 interprets this research from the perspective of five-factor theory.

Caspi, Avshalom, Brent W. Roberts, and Rebecca L. Shiner. 2005. Personality development: Stability and change. *Annual Review of Psychology* 56.1: 453–484.

This article reviews research examining personality structure in childhood and adulthood, the genetic origins of personality traits, personality change across the lifespan, and personality influences on life outcomes.

McCrae, Robert R., and Paul T. Costa Jr. 2003. *Personality in adulthood: A Five-Factor Theory perspective*. 2d ed. New York: Guilford.

This book reviews research on adult personality development and interprets this research in terms of five-factor theory (see also McCrae and Costa 2008, cited under Theoretical Perspectives). It also considers many important methodological issues in the study of personality stability and change.

Roberts, Brent W., Dustin Wood, and Avshalom Caspi. 2008. The development of personality traits in adulthood. In *Handbook of personality: Theory and research*. 3d ed. Edited by Oliver P. John, Richard W. Robins, and Lawrence A. Pervin, 375–398. New York: Guilford.

This chapter reviews several types of evidence regarding personality stability and change across adulthood. It then considers possible mechanisms underlying adult personality development.

CHILDHOOD AND ADOLESCENCE

Can the Big Five/five-factor model of personality (FFM) structure be meaningfully applied to children and adolescents? The papers in this section investigate the measurement and development of the Big Five across these years and test whether they predict important behaviors and outcomes. They show that the Big Five can be recovered from youths' personality self-ratings (Measelle, et al. 2005; Soto, et al. 2008), as well as from parents' (John, et al. 1994) and teachers' (Goldberg 2001) ratings of children and adolescents. Shiner and Caspi 2003 reviews and integrates research on personality structure in childhood. De Fruyt, et al. 2006 and McCrae, et al. 2002 test for stability and change in the Big Five across childhood and adolescence.

De Fruyt, Filip, Meike Bartels, Karla G. Van Leeuwen, Barbara De Clercq, Mieke Decuyper, and Ivan Mervielde. 2006. Five types of personality continuity in childhood and adolescence. *Journal of Personality and Social Psychology* 91.3: 538–552.

This article examines structural, mean-level, individual-level, rank-order, and ipsative stability and change in personality traits. It finds considerable personality continuity in two samples of children and adolescents.

Goldberg, Lewis R. 2001. Analyses of Digman's child-personality data: Derivation of Big-Five factor scores from each of six samples. *Journal of Personality* **69.5: 709–744.**

This article repeatedly recovers the Big Five/FFM structure from teacher ratings of elementary school students. Its findings suggest that children's personalities can be described in terms of the Big Five.

John, Oliver P., Avshalom Caspi, Richard W. Robins, Terrie E. Moffitt, and Magda Stouthamer-Loeber. 1994. The "little five": Exploring the nomological network of the five-factor model of personality in adolescent boys. *Child Development* **65.1: 160–178.**

This study recovers the Big Five, plus two additional dimensions—irritability and positive activity—in parent-ratings of adolescent boys. It also shows that these ratings predict important academic, behavioral, and mental-health outcomes. These findings suggest the possible existence and importance of personality dimensions specific to childhood and adolescence.

McCrae, Robert R., Paul T. Costa Jr., Antonio Terracciano, et al. 2002. Personality trait development from age 12 to age 18: Longitudinal, cross-sectional and cross-cultural analyses. *Journal of Personality and Social Psychology* **83.6: 1456–1468.**

This article examines personality development using self-reports from three samples of adolescents. Interestingly, it finds much lower rank-order stability in adolescence than similar studies have found in adulthood, suggesting that different adolescents' personalities may change in quite different ways.

Measelle, Jeffrey R., Oliver P. John, Jennifer C. Ablow, Philip A. Cowan, and Carolyn P. Cowan. 2005. Can children provide coherent, stable, and valid self-reports on the Big Five dimensions? A longitudinal study from ages 5 to 7. *Journal of Personality and Social Psychology* **89.1: 90–106.**

This study finds that children can provide Big Five self-reports, through a specially designed interview, as early as age five. These self-reports showed rank-order stability over time and predicted relevant behavioral outcomes.

Shiner, Rebecca, and Avshalom Caspi. 2003. Personality differences in childhood and adolescence: Measurement, development, and consequences. *Journal of Child Psychology and Psychiatry* **44.1: 2–32.**

This article proposes that at least four of the Big Five—Extraversion, Agreeableness, Conscientiousness, and Neuroticism—can be meaningfully applied to children and adolescents. It then discusses the processes by which childhood temperament might be elaborated into adult personality, as well as how temperament might influence later psychopathology.

Soto, Christopher J., Oliver P. John, Samuel D. Gosling, and Jeff Potter. 2008. The developmental psychometrics of Big Five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages ten to twenty. *Journal of Personality and Social Psychology* **94.4: 718–737.**

This study shows that the Big Five/FFM structure can be recovered from self-reports on the Big Five Inventory (BFI; see also John, et al. 2008, cited under General Overviews) as early as age ten, although the reliability and structural validity of these reports improves with age. Interestingly, its results suggest that children and adolescents can self-report about some personality traits better than others.

MEAN-LEVEL AGE DIFFERENCES

How does the personality of a typical eighteen-year-old differ from that of a typical thirty-five-year-old or seventy-five-year-old? The papers in this section test for age differences in mean levels of the Big Five. Their findings indicate how personality traits typically change across the life span. Donnellan and Lucas 2008 and Srivastava, et al. 2003 examine age differences in the Big Five using large cross-sectional samples. Roberts, et al. 2006 integrates findings from dozens of longitudinal studies. Soto, et al. 2011 and Terracciano, et al. 2005 examine age differences in facet-level traits and find that some facets show distinctive developmental trends.

Donnellan, M. Brent, and Richard E. Lucas. 2008. Age differences in the Big Five across the life span: Evidence from two national samples. *Psychology and Aging* 23.3: 558–566.

This article tests for cross-sectional age differences in the Big Five from adolescence into late adulthood using nationally representative samples from Germany and the United Kingdom. It finds that mean levels of Agreeableness increase with age, levels of Extraversion and Openness decrease with age, and levels of Conscientiousness peak in middle age.

Roberts, Brent W., Kate E. Walton, and Wolfgang Viechtbauer. 2006. Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin* 132.1: 1–25.

This meta-analysis integrates results from ninety-two longitudinal studies of mean-level change in personality traits. In terms of the Big Five, it finds that levels of Agreeableness, Conscientiousness, and the social-dominance facet of Extraversion (assertiveness and talkativeness) increase with age across adulthood, levels of Neuroticism and the social-vitality facet of Extraversion (sociability and gregariousness) decrease with age, and levels of Openness to Experience decrease in late adulthood.

Soto, Christopher J., Oliver P. John, Samuel D. Gosling, and Jeff Potter. 2011. Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology* 100.2: 330–348.

This study extends the findings documented in Srivastava, et al. 2003 by examining cross-sectional age differences in the Big Five domains and more-specific facet traits from late childhood through middle age using an Internet sample of more than one million participants. It shows that late childhood and adolescence are key periods for personality development and that some facet traits show distinctive age trends.

Srivastava, Sanjay, Oliver P. John, Samuel D. Gosling, and Jeff Potter. 2003. Development of personality in early and middle adulthood: Set like plaster or persistent change? *Journal of Personality and Social Psychology* 84.5: 1041–1053.

This study examines cross-sectional age differences in the Big Five across early adulthood and middle age using an Internet sample of more than 200,000 participants. It finds mean-level increases in Agreeableness and Conscientiousness, as well as decreases in Neuroticism among women.

Terracciano, Antonio, Robert R. McCrae, Larry J. Brant, and Paul T. Costa Jr. 2005. Hierarchical linear modeling analyses of the NEO-PI-R scales in the Baltimore Longitudinal Study of Aging. *Psychology and Aging* 20.3: 493–506.

This longitudinal study examines the adult development of the Big Five domains and more-specific facet traits. It shows that mean levels of Agreeableness increase with age, levels of Neuroticism, Extraversion, and Openness to Experience decline, and levels of Conscientiousness peak in middle age. It also finds distinctive age trends for some facet traits.

RANK-ORDER CHANGE

Another way to examine change is the relative standing of individuals across time. Does a child who is more extraverted than his or her peers become an adult who is also more extraverted than his or her peers? Hampson and Goldberg 2006 and Soldz and Vaillant 1999 find some rank-order consistency for the Big Five across time spans of forty-plus years. Roberts and DelVecchio 2000 summarizes the results of several dozen longitudinal studies.

Hampson, Sarah E., and Lewis R. Goldberg. 2006. A first large cohort study of personality trait stability over the 40 years between elementary school and midlife. *Journal of Personality and Social Psychology* 91.4: 763–779.

The rank-order consistency of the Big Five traits across forty years was examined using teacher-rated personality in childhood and self-reported personality in adulthood. Extraversion and Conscientiousness evidenced rank-order stability, but the remaining traits were relatively low. Findings indicate some continuity of personality across time and contexts.

Roberts, Brent W., and Wendy F. DelVecchio. 2000. The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin* **126.1: 3–25.**

This meta-analysis finds that the rank-order consistency is modest throughout the lifespan for each of the Big Five traits, indicating that both stability and change can coexist. Interestingly, rank-order consistency increases from childhood to middle adulthood when the rank-order consistency of personality plateaus around age fifty.

Soldz, Stephen, and George E. Vaillant. 1999. The Big Five personality traits and the life course: A 45-year longitudinal study. *Journal of Research in Personality* **33.2: 208–232.**

This study finds that the traits of Extraversion, Neuroticism and Openness are relatively consistent across forty-five years, from college to older adulthood. Findings suggest continuity of personality across long time periods and across contexts.

CHANGE PROCESSES

The studies reviewed above indicate that the Big Five personality traits are both stable and open to change across the lifespan. The papers in this section review the different factors that may contribute to personality stability and change. Roberts, et al. 2005 evaluates two prominent theories of personality development: social investment theory and five-factor theory. Bleidorn, et al. 2009 examines the relative contributions of genetic and environmental factors to personality change. Several papers show that personality changes are associated with specific life experiences, including military service (Jackson, et al. 2012b), work (Roberts, et al. 2003), and close relationships (Neyer and Asendorpf 2001, Specht, et al. 2011, Wood and Roberts 2006). Jackson, et al. 2012a and Piedmont 2001 show that cognitive and therapeutic interventions, respectively, can also lead to personality change.

Bleidorn, Wiebke, Christian Kandler, Rainer Riemann, Alois Angleitner, and Frank M. Spinath. 2009. Patterns and sources of adult personality development: Growth curve analyses of the NEO PI-R scales in a longitudinal twin study. *Journal of Personality and Social Psychology* **97.1: 142–155.**

This study examines the genetic and heritable components of personality trait change across ten years. Changes in personality were influenced by both genetic and environmental factors, suggesting that personality trait change can occur through both genetic and environmental reasons.

Jackson, Joshua J., Patrick L. Hill, Brent W. Roberts, Brennan R. Payne, and Elizabeth Stine-Morrow. 2012a. Can an old dog learn (and want to experience) new tricks? Cognitive training increases openness to experience in older adults. *Psychology and Aging* **27.2: 286–292.**

This is one of the first nonpharmacological or therapy interventions that resulted in changes to a Big Five personality trait. Older adults who were trained in inductive reasoning skills and performed crossword puzzles increased in Openness compared to a control group.

Jackson, Joshua J., Felix Thoemmes, Kathrin Jonkmann, Oliver Lüdtke, and Ulrich Trautwein. 2012b. Military training and personality trait development: Does the military make the man, or does the man make the military? *Psychological Science* **23.3: 270–277.**

This study finds that military service is associated with suppressed levels of Agreeableness compared to a control group. The changes associated with military service remained four years later, after recruits left the military and entered the labor force.

Neyer, Franz J., and Jens B. Asendorpf. 2001. Personality-relationship transaction in young adulthood. *Journal of Personality and Social Psychology* **81.6: 1190–1204.**

This four-year study identified that romantic relationships are associated with changes in personality traits. Additionally, personality traits predicted changes in social relationships, but the opposite was not true.

Piedmont, Ralph L. 2001. Cracking the plaster cast: Big Five personality change during intensive outpatient counseling. *Journal of Research in Personality* **35.4: 500–520.**

This study found that a drug rehabilitation program led to changes in each of the Big Five, most notably decreases in Neuroticism. Interestingly, these changes occurred over a relatively short intervention period of just six weeks.

Roberts, Brent W., Avshalom Caspi, and Terrie E. Moffitt. 2003. Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology* **84.3: 582–593.**

This study finds that personality predicts work experiences and that work experiences are associated with changes in personality traits. This corresponsive association (i.e., personality leads to experiences, which then are associated with personality change) appears to be a general mechanism for change.

Roberts, Brent W., Dustin Wood, and Jennifer L. Smith. 2005. Evaluating Five Factor Theory and social investment perspectives on personality trait development. *Journal of Research in Personality* **39.1: 166–184.**

This article reviews the evidence of the five-factor theory (FFT) and the social investment theory (SIT) concerning the mechanisms that drive personality trait change. Across longitudinal, behavioral, genetic, and cross-cultural studies, evidence points to social roles as the reason for changes in personality traits, not just genetic mechanisms. The results are more in accordance with the social investment theory than with the five-factor theory.

Specht, Jule, Boris Egloff, and Stefan C. Schmukle. 2011. Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology* **101.4: 862–882.**

In this study, a number of life experiences were associated with personality trait change. For example, Conscientiousness was associated with divorce, childbirth, and retirement, whereas changes in Extraversion were associated with getting married and with moving in with a partner.

Wood, Dustin, and Brent W. Roberts. 2006. Cross-sectional and longitudinal tests of the Personality and Role Identity Structural Model (PRISM). *Journal of Personality* **74.3: 779–810.**

This paper distinguishes context-specific personality traits from the more general Big Five personality traits. Findings from this study suggest that changes in roles lead to changes in context-specific personality traits, which then can lead to changes in the broader, more general traits.

Predicting Behaviors and Life Outcomes

One of the reasons for the ubiquity of the Big Five is their ability to predict a wide swath of important life outcomes, sometimes decades in the future. The papers in this section highlight the many domains of behavior and real life outcomes that the Big Five predict. Magnus, et al. 1993 examines how personality traits shape people's everyday experiences. Ozer and Benet-Martínez 2006 reviews evidence that the Big Five predict a variety of life outcomes, such as life goals, physical health, psychopathology, romantic relationships, subjective

well-being, and work and achievement. Roberts, et al. 2007 compares the predictive power of personality traits to that of intelligence and socioeconomic status and discusses some of the likely mechanisms by which personality influences life outcomes.

Magnus, Keith, Ed Diener, Frank Fujita, and William Pavot. 1993. Extraversion and neuroticism as predictors of objective life events: A longitudinal analysis. *Journal of Personality and Social Psychology* **65.5: 1046–1053.**

An early paper on the predictive utility of personality traits that found that positive life events are associated with Extraversion and negative life events with Neuroticism. The study suggests that personality shapes the experiences one encounters and discusses how personality shapes the subjective viewpoint of objective experiences.

Ozer, Daniel J., and Veronica Benet-Martínez. 2006. Personality and the prediction of consequential outcomes. *Annual Review of Psychology* **57: 401–421.**

This review article relates Big Five personality traits to many different life outcomes, such as spirituality, health, community involvement, and political ideology.

Roberts, B. W., N. R. Kuncel, R. Shiner, A. Caspi, and L. R. Goldberg. 2007. The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on psychological science* **2:313–345.**

In this meta-analysis, the predictive validity of Big Five traits for the domains of longevity, divorce, and occupational attainment is compared with the predictive validity of socioeconomic status and cognitive ability. Findings suggest that the Big Five are as good or better predictors of these important life outcomes.

ATTITUDES, GOALS, AND MOTIVATION

Do the Big Five relate to other domains of individual differences such as goals, motives, and general attitudes? This section provides evidence that the Big Five play a role in each of these constructs. Carney, et al. 2008 and Jost, et al. 2003 detail how personality traits influence political attitudes. MacDonald 2000 finds that traits also relate to spiritual attitudes. Roberts and Robins 2000 provides evidence that personality traits shape people's life goals, and Lucas, et al. 2000 argues that reward sensitivity is the core motivational feature of extraversion.

Carney, Dana R., John T. Jost, Samuel D. Gosling, and Jeff Potter. 2008. The secret lives of liberals and conservatives: Personality profiles, interaction styles, and the things they leave behind. *Political Psychology* **29.6: 807–840.**

The personality differences between liberals and conservatives are associated with the personality traits of Conscientiousness and Openness to Experience. Personality traits are especially useful for distinguishing social (versus economic) dimensions of political ideology.

Jost, John T., Jack Glaser, Arie W. Kruglanski, and Frank J. Sulloway. 2003. Political conservatism as motivated social cognition. *Psychological Bulletin* **129.3: 339–375.**

This meta-analysis associates higher levels of Openness to Experience with lower levels of political conservatism.

Lucas, Richard E., Ed Diener, Alexander Grob, Eunkook M. Suh, and Liang Shao. 2000. Cross-cultural evidence for the fundamental features of extraversion. *Journal of Personality and Social Psychology* **79.3: 452–468.**

Across four studies, the authors identify that a core feature of Extraversion is reward sensitivity, which implies that the sociability aspect of Extraversion arises from reward sensitivity.

MacDonald, Douglas A. 2000. Spirituality: Description, measurement, and relation to the five factor model of personality. *Journal of Personality* **68.1: 153–197.**

This study empirically identifies a number of dimensions related to spirituality and relates these dimensions to the Big Five.

Roberts, Brent W., and Richard W. Robins. 2000. Broad dispositions, broad aspirations: The intersection of personality traits and major life goals. *Personality and Social Psychology Bulletin* **26.10: 1284–1296.**

This paper is one of the first to use the Big Five to predict a broad range of life goals such as economic, family, or political goals. Extraversion and Agreeableness were the strongest predictors.

EVERYDAY BEHAVIOR

The Big Five personality traits are thought to reflect the relatively enduring tendency to think, feel, and behave in a specific manner. However, surprisingly few studies use behavior to better understand personality. Papers in this section show that strangers can accurately infer personality traits from observing people's bedrooms and offices (Gosling, et al. 2002), musical preferences (Rentfrow and Gosling 2003), and brief samples of behavior (Funder and Sneed 1993). Jackson, et al. 2010 identifies specific behaviors associated with Conscientiousness. Paunonen and Ashton 2001 provides evidence that many specific behaviors can be predicted more accurately from facet-level traits than from the Big Five domains themselves.

Funder, David C., and Carl D. Sneed. 1993. Behavioral manifestations of personality: An ecological approach to judgmental accuracy. *Journal of Personality and Social Psychology* **64.3: 479–490.**

In this study, unacquainted observers were able to assess the personalities of people they had never met just by watching a series of behaviors. The ability to make such inferences was found to be due to accurately assessing specific behavioral cues that are associated with each personality trait.

Gosling, Samuel D., Sei J. Ko, Thomas Mannarelli, and Margaret E. Morris. 2002. A room with a cue: Personality judgments based on offices and bedrooms. *Journal of Personality and Social Psychology* **82.3: 379–398.**

This study suggests that we leave traces of our personality in the places we occupy. By just viewing offices and dorm rooms, unacquainted observers could identify the personality of the occupant.

Jackson, Joshua J., Dustin Wood, Tim Bogg, Kate Walton, Peter Harms, and Brent W. Roberts. 2010. What do conscientious people do? Development and validation of the Behavioral Indicators of Conscientiousness Scale (BICS). *Journal of Research in Personality* **44.4: 501–511.**

This article identifies everyday behaviors that are associated with Conscientiousness, such as showing up to meetings on time and cleaning dishes. Furthermore, these behaviors are used to identify a lower-order structure of Conscientiousness.

Mehl, Matthias R., Samuel D. Gosling, and James W. Pennebaker. 2006. Personality in its natural habitat: Manifestations and implicit folk theories of personality in daily life. *Journal of Personality and Social Psychology* **90.5: 862–877.**

This study uses the Big Five traits to predict randomly recorded sounds during the participants daily life. These findings suggest that personality manifests itself into everyday microlevel behaviors such as language use, location, specific activities, and moods.

Paunonen, Sampo V., and Michael C. Ashton. 2001. Big Five factors and facets and the prediction of behavior. *Journal of Personality and Social Psychology* 81.3: 524–539.

This study investigates the bandwidth-fidelity tradeoff and finds that more-specific, lower-order measurements are better predictors of a broad number of behaviors.

Rentfrow, Peter J., and Samuel D. Gosling. 2003. The do re mi's of everyday life: The structure and personality correlates of music preferences. *Journal of Personality and Social Psychology* 84.6: 1236–1256.

This study identifies a measurement model of musical preferences and then associates different styles of music with different Big Five personality profiles.

PHYSICAL HEALTH

One of the most important life outcomes that personality traits are related to is physical health. This section reviews studies that link the Big Five to different health outcomes and discusses some of the reasons for these associations. Lahey 2009 summarizes the relations of Neuroticism to health. The importance of Conscientiousness for health is shown by a pair of studies connecting this domain to longevity (Kern and Friedman 2008, Martin, et al. 2007), as well as a meta-analysis of the associations between Conscientiousness and health behaviors (Bogg and Roberts 2004). In a long-term longitudinal study, Hampson, et al. 2007 tests some mechanisms that may help explain the relations between personality traits and health.

Bogg, Tim, and Brent W. Roberts. 2004. Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality. *Psychological Bulletin* 130.6: 887–919.

This paper meta-analytically reviews the association between the major health behaviors related to mortality (e.g., risky driving, healthy eating habits) and Conscientiousness. Findings suggest that Conscientiousness is related to all the major health behaviors associated with mortality.

Hampson, Sarah E., Lewis R. Goldberg, Thomas M. Vogt, and Joan P. Dubanoski. 2007. Mechanisms by which childhood personality traits influence adult health status: Educational attainment and healthy behaviors. *Health Psychology* 26.1: 121–125.

This forty-year longitudinal study identifies some of the processes by which personality traits influence health outcomes. Findings suggest that childhood levels of Agreeableness, Conscientiousness, and Openness were associated with health in adulthood partially through eating habits, smoking, and educational attainment.

Kern, Margaret L., and Howard S. Friedman. 2008. Do conscientious individuals live longer? A quantitative review. *Health Psychology* 27.5: 505–512.

In this meta-analysis, Conscientiousness is associated with mortality risk across twenty different studies. Findings suggest that the industriousness and orderliness facets are most strongly related to mortality risk.

Lahey, Benjamin B. 2009. Public health significance of neuroticism. *American Psychologist* 64.4: 241–256.

This article reviews Neuroticism's relations to physical and mental health, discusses its origins and development, and considers possible causal mechanisms by which Neuroticism might influence health outcomes.

Martin, Leslie R., Howard S. Friedman, and Joseph E. Schwartz. 2007. Personality and mortality risk across the life span: The importance of conscientiousness as a biopsychosocial attribute. *Health Psychology* 26.4: 428–436.

In a long-term study, the trait of Conscientiousness predicted mortality risk using both childhood and adulthood assessments of Conscientiousness. The relationship between Conscientiousness and mortality risk was partially explained by health behaviors.

PSYCHOPATHOLOGY

Despite being developed to describe "normal" personality, the Big Five traits also assess more abnormal levels of personality functioning. These studies demonstrate the overlap between traditional Big Five measures and different forms of psychopathology. Kotov, et al. 2010 and Trull and Sher 1994 examine how the Big Five relate to clinical (Axis I) disorders, whereas Samuel and Widiger 2008 summarizes how they relate to personality (Axis II) disorders.

Kotov, Roman, Wakiza Gamez, Frank Schmidt, and David Watson. 2010. Linking "big" personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin* 136.5: 768–821.

This meta-analysis demonstrates that high levels of Neuroticism and low levels of Conscientiousness overlap considerably with clinical disorders. These findings suggest that findings from studies of the Big Five can help inform psychopathology research.

Samuel, Douglas B., and Thomas A. Widiger. 2008. A meta-analytic review of the relationships between the five-factor model and DSM-IV-TR personality disorders: A facet level analysis. *Clinical Psychology Review* 28.8: 1326–1342.

This study finds a considerable relationship between Axis II personality disorders and the Big Five traits, which suggests personality disorders can be thought of as maladaptive variants of personality traits. The study also identifies some usefulness in looking at the facets of the Big Five, rather than at broad, general traits.

Trull, Timothy J., and Kenneth J. Sher. 1994. Relationship between the five-factor model of personality and Axis I disorders in a nonclinical sample. *Journal of Abnormal Psychology* 103.2: 350–360.

This study was one of the first to associate the Big Five with psychopathology and paved the way for future studies that highlight the usefulness of personality traits to better understand psychopathology.

RELATIONSHIPS AND SOCIAL STATUS

Another major domain that the Big Five traits influence is social relationships. Big Five traits affect social status (Anderson, et al. 2001) as well as the processes underlying prosocial emotions and behavior (McCullough, et al. 2002). They also play an important role in romantic relationships. Noftle and Shaver 2006 identifies relations between the Big Five and adult attachment styles. Watson, et al. 2000 shows that one's own personality and the personality of one's partner both influence relationship satisfaction. Moreover, Luo and Klohnen 2005 finds that relationship partners with more similar Big Five profiles tend to experience greater marital satisfaction.

Anderson, Cameron, Oliver P. John, Dacher Keltner, and Ann M. Kring. 2001. Who attains social status? Effects of personality and physical attractiveness in social groups. *Journal of Personality and Social Psychology* 81.1: 116–132.

This study identifies the predictors of high social status. In terms of Big Five traits, Extraversion was associated with higher levels of status as well as lower levels of Neuroticism for men.

Luo, Shanhong, and Eva C. Klohnen. 2005. Assortative mating and marital quality in newlyweds: A couple-centered approach. *Journal of Personality and Social Psychology* 88.2: 304–326.

This study finds that romantic couples tend to select partners that share similar attitudes, but do not self-select partners that are similar with regard to personality traits. However, couples that were similar in personality were more likely to be satisfied in their relationship.

McCullough, Michael E., Robert A. Emmons, and Jo-Ann Tsang. 2002. The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology* **82.1: 112–127.**

This study identifies gratefulness as an affective disposition that, while associated with the Big Five, is distinct from them and from positive affect. Findings suggest that grateful individuals are more likely to participate in prosocial behaviors and attend spiritual services.

Noftle, Erik E., and Phillip R. Shaver. 2006. Attachment dimensions and the Big Five personality traits: Associations and comparative ability to predict relationship quality. *Journal of Research in Personality* **40.2: 179–208.**

This study identifies that there is an overlap between the Big Five and adult attachment measures—most notably with the trait of Neuroticism. Additionally, the study finds that attachment measures predict relationship quality above and beyond Big Five measures.

Watson, David, Brock Hubbard, and David Wiese. 2000. General traits of personality and affectivity as predictors of satisfaction in intimate relationships: Evidence from self- and partner-ratings. *Journal of Personality* **68.3: 413–449.**

In this study, the personalities of both members of a romantic relationship were used to predict their partner's levels of relationship satisfaction. Results indicate the personality of one's partner matters for relationship satisfaction.

SELF-CONCEPT

The Big Five traits also play a role in the self-concept, or how people view themselves. Robins, et al. 2001 finds that personality traits are closely related to, but distinguishable from, self-esteem. Campbell, et al. 1996 shows that personality traits also relate to self-concept clarity—how clearly a person sees him- or herself from one day or situation to the next.

Campbell, Jennifer D., Paul D. Trapnell, Steven J. Heine, Ilana M. Katz, Loraine F. Lavallee, and Darrin R. Lehman. 1996. Self-concept clarity: measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology* **70.1: 141–156.**

This study finds that high levels of Agreeableness, high levels of Conscientiousness, and low levels of Neuroticism are associated with higher levels of self-concept clarity.

Robins, Richard W., Jessica L. Tracy, Kali Trzesniewski, Jeff Potter, and Samuel D. Gosling. 2001. Personality correlates of self-esteem. *Journal of Research in Personality* **35.4: 463–482.**

In a large Internet sample, high levels of self-esteem were associated with higher levels of Extraversion, Conscientiousness, and emotional stability.

SUBJECTIVE WELL-BEING

Another important life outcome that personality traits are associated with is subjective well-being. DeNeve and Cooper 1998; Diener, et al. 2003; and Steel, et al. 2008 review the literature linking personality traits with emotional and cognitive measures of well-being. The two other papers in this section consider mechanisms by which personality traits may influence well-being. Sheldon, et al. 1997 finds that greater personality consistency across different social roles predicts higher well-being. Headey and Wearing 1989 provides evidence that personality traits affect well-being by creating stable patterns of positive and negative life events.

DeNeve, Kristina M., and Harris Cooper. 1998. The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin* **124.2: 197–229.**

This meta-analysis identifies that the traits of Extraversion, Neuroticism, and Conscientiousness are most highly associated with subjective well-being.

Diener, Ed, Shigehiro Oishi, and Richard E. Lucas. 2003. Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology* **54:403–425.**

This review details the many studies that link subjective well-being with personality traits. Personality traits are not the only determinants of subjective well-being, as life events and cultural differences also play an important role.

Headey, Bruce, and Alexander Wearing. 1989. Personality, life events, and subjective well-being: Toward a dynamic equilibrium model. *Journal of Personality and Social Psychology* **57.4: 731–739.**

This longitudinal study suggests that while the Big Five traits influence well-being, life events are more important in determining changes in well-being.

Sheldon, Kennon M., Richard M. Ryan, Laird J. Rawsthorne, and Barbara Ilardi. 1997. Trait self and true self: Cross-role variation in the Big-Five personality traits and its relations with psychological authenticity and subjective well-being. *Journal of Personality and Social Psychology* **73.6: 1380–1393.**

This article shows that individuals often express different Big Five traits in different social roles (e.g., as a student versus as a romantic partner), but that greater consistency between a person's general self-concept and the traits they express in a particular role predicts greater feelings of satisfaction and authenticity in that role. Finally, it shows that greater overall trait consistency across social roles predicts greater overall subjective and physical well-being.

Steel, Piers, Joseph Schmidt, and Jonas Shultz. 2008. Refining the relationship between personality and subjective well-being. *Psychological Bulletin* **134.1: 138–161.**

This meta-analysis further investigates the link between the Big Five and subjective well-being by analyzing specific measures instead of grouping together multiple broad-bandwidth scales. The authors conclude that specific scales evidence higher personality-subjective well-being (SWB) relations and that past studies have underestimated the link between personality traits and subjective well-being.

WORK AND ACHIEVEMENT

Personality traits are also associated with a number of academic and occupational outcomes. Noftle and Robins 2007 and Poropat 2009 show that the Big Five, especially Conscientiousness, predict academic achievement, including grades and standardized test scores. As for occupational outcomes, Judge, et al. 1999 demonstrates that childhood personality traits predict adult career attainment. A series of meta-analyses shows that personality traits relate to job performance (Barrick and Mount 1991, Mount, et al. 1998), job satisfaction (Judge, et al. 2002b), and leadership (Judge, et al. 2002a). Hogan, et al. 1996 explains how employers can use personality assessments in the personnel selection process.

Barrick, Murray R., and Michael K. Mount. 1991. The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology* **44.1: 1–26.**

In this meta-analysis, three different types of job performance across a number of different occupations were linked to the Big Five traits. Findings suggest that Conscientiousness was important for different types of performance and across varying occupations. Other Big Five traits were important but less so, and efficacy was tied to specific occupations.

Hogan, Robert, Joyce Hogan, and Brent W. Roberts. 1996. Personality measurement and employment decisions: Questions and answers. *American Psychologist* **51.5: 469–477.**

This paper provides compelling reasons to use the Big Five as a tool for personnel selection, such as the predictive validity of job success, as detailed above. In addition, the paper addresses several common misconceptions about personality assessment.

Judge, Timothy A., Joyce E. Bono, Remus Ilies, and Megan W. Gerhardt. 2002a. Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology* **87.4: 765–780.**

This meta-analysis finds that four of the Big Five traits predict leadership, with only the trait of Agreeableness not associated with leadership. Together, the remaining four personality traits explain substantial variance in leadership ability.

Judge, Timothy A., Daniel Heller, and Michael K. Mount. 2002b. Five-factor model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology* **87.3: 530–541.**

This meta-analysis suggests that the traits of Extraversion, Agreeableness, Conscientiousness, and Neuroticism are all associated with job satisfaction.

Judge, Timothy A., Chad A. Higgins, Carl J. Thoresen, and Murray R. Barrick. 1999. The big five personality traits, general mental ability, and career success across the life span. *Personnel Psychology* **52.3: 621–652.**

In this long-term longitudinal study, childhood levels of Conscientiousness predicted extrinsic and intrinsic success, while Neuroticism predicted extrinsic success. Childhood levels of personality traits predicted these outcomes above and beyond cognitive ability and personality assessed in adulthood.

Mount, Michael K., Murray R. Barrick, and Greg L. Stewart. 1998. Five-factor model of personality and performance in jobs involving interpersonal interactions. *Human Performance* **11.2–3: 145–165.**

This meta-analysis finds that the Big Five traits of Agreeableness, Conscientiousness, and emotional stability are the traits most strongly associated with job performance in jobs involving interpersonal interactions.

Noftle, Erik E., and Richard W. Robins. 2007. Personality predictors of academic outcomes: Big Five correlates of GPA and SAT scores. *Journal of Personality and Social Psychology* **93.1: 116–130.**

The authors associate Big Five traits with high school GPA, college GPA, and SAT scores. Conscientiousness predicted college GPA even after controlling for high school GPA and SAT scores.

Poropat, Arthur E. 2009. A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin* **135.2: 322–338.**

This meta-analysis links the Big Five traits with academic performance across different academic levels. Conscientiousness emerges as the best predictor of academic performance.