Infant and Child Development
Inf. Child. Dev. (2010)
Published online in Wiley InterScience
(www.interscience.wiley.com). DOI: 10.1002/icd.663

Individual Differences in Preschool Children: Temperament or Personality?

Cathy L. Grist[a,*] and David M. McCord[b]
[a]*Department of Human Services, Western Carolina University, NC, USA*
[b]*Department of Psychology, Western Carolina University, NC, USA*

Individual differences among adults have generally been conceptualized in terms of personality theory and traits. In contrast, individual differences among very young children (birth to kindergarten) have generally been conceptualized in terms of temperament theory and traits. The present study compares and contrasts measures of temperament and personality in a sample of preschool children. Temperament traits were assessed with a well-established measure (the Rothbart CBQ), and a new preschool rating instrument was used to assess personality traits from the five-factor framework (M5-PS). Indeed, a key purpose of this study was to further the development of the M5-PS. Data were gathered on 122 preschool children who were rated by their teachers. Significant correlations were found between the temperament trait Surgency and the personality trait Extraversion, between the temperament trait Negative Affect and the personality trait Neuroticism, and between the temperament trait Effortful Control and the personality trait Conscientiousness. The overall pattern of correlational data suggests that individual differences in preschool children can be adequately described using the five-factor theory, and that this framework may effectively subsume traditional theories of temperament. Preliminary support for the reliability and validity of the M5-PS is offered. Copyright © 2010 John Wiley & Sons, Ltd.

Key words: temperament; personality development; personality in early childhood

Individual differences among adults have generally been conceptualized in terms of personality theory and traits, while temperament has been historically the dominant framework for studying individual differences in young children (birth to kindergarten). Theorists and researchers have not reached consensus as to the

*Correspondence to: Cathy L. Grist, Department of Human Services, Western Carolina University, Cullowhee, NC 28723, USA. E-mail: clgrist@wcu.edu

differences between temperament and personality in young children, and no single model of temperament or personality has been established as the most useful framework for this age group.

The traditional view is that temperament traits are largely genetic and biological in nature, present early in childhood, and generally stable across the lifespan (Buss & Plomin, 1975; Strelau, 1987; Thomas & Chess, 1977). The traditional view of personality characteristics, at least according to most historic theoretical models, is that personality is acquired more gradually through experience, probably more a product of nurture than nature, more learned than innate. With regard to young children, temperament has been described as the underlying core of personality, comprised of emotionality, activity level, and attention characteristics among others, whereas personality has been seen as a broader domain of characteristics, most requiring more mature cognitive functioning, including such conceptual domains as values, beliefs, and attitudes (Rothbart & Bates, 2006). Traditionally, then, the distinction between temperament and personality has been relatively conceptually clear. As will be seen below, current theoretical views on temperament, and especially personality, substantially blur this distinction, raising the question of whether both conceptual domains are necessary.

Current perspectives on temperament are well presented by Rothbart and Bates (2006). They describe temperament as a dynamic, changing process that extends through childhood into adulthood, and includes tendencies or dispositions that emerge under some conditions and not under others. Because relatively mature cognitive skills are needed in order to begin the development of personality traits, stable personality traits do not emerge until an individual is an older child or adult (Costa & McCrae, 1992a; Rothbart, Ahadi, & Evans, 2000; Strelau, 1987). Specific temperamental traits are considered to predispose the individual towards specific levels of related personality traits. For example, high-activity level (temperament) may favour the subsequent personality constellation of extraversion rather than introversion. The individual's history of interpersonal and other life experiences interact with temperament to shape and refine ultimate personality traits (Rothbart *et al*., 2000). Furthermore, some temperament characteristics may not be present at birth but emerge later in childhood, and, while there is a degree of stability to many basic temperaments, they also change with development and in response to experience (Rothbart & Bates, 2006). General consensus has been reached on at least two issues: (i) temperament consists of a set of related traits rather than a single dimension (Goldsmith *et al*., 1987); (ii) *emotionality* and *activity level* are dimensions that are present in most theories.

Rothbart and Derryberry (1981) define temperament as a stable, biological collection of traits that differ in each individual based on reactivity and self-regulation. Temperament is seen fundamentally as the arousability or excitability of behaviour. It is affected by heredity, maturation, and experience over time, and it relates to individual variations in motivational and attentional adaptations. The three broad dimensions in this theory are Surgency, Negative Affect and Effortful Control. Surgency, or extraversion, refers to the child's desire for warmth and closeness with others, their positive affective responsiveness to stimulation and novelty, and also their speed of response and level of gross motor activity. The Negative Affect domain includes frequency and intensity of fear responses, negative affect related to frustration, distress resulting from outside stimulation, tendency towards sadness and lowered mood, and ability to recover from such negative affective states. Effortful Control includes the capacity to focus and short attention, control or inhibit impulses, and to derive pleasure from low-intensity stimuli (Rothbart, 2007).

DOI: 10.1002/icd

The emergence over the past 20–25 years of the five-factor theory of personality (FFT) has begun to challenge the distinction between biologically based temperament and primary personality traits (see, for example, Digman, 1990; Goldberg, 1993). The FFT has been shown as a useful perspective across a wide range of cultures, age groups, and even species (Costa & McCrae, 1992a; Gosling & John, 1999).

Many studies have demonstrated the applicability of the FFT to adolescents and older children (e.g. Costa & McCrae, 1994; Digman & Shmelyov, 1996). A significant cross-cultural study was conducted by Kohnstamm, Halverson, Mervielde, and Havill (1998) that included younger children as well. In part to combat the cultural restrictiveness often involved by using 'top-down' theories and rating systems in evaluating children, they employed a qualitative research approach and a 'free description' method of data collection. Briefly, they interviewed parents of children ranging in age from 2 to 13, from seven different countries. In some samples they simply asked parents to tell them about their children. In other samples the word 'personality' was mentioned as a concept of interest, and parents were asked, 'Can you tell me what you think is characteristic of your child?' Parent responses were transcribed and coded (by multiple raters), using a categorization system designed by the study authors. Based upon emerging developments in the five-factor theory, they included these five domains (Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness to Experience) among other categories. They then included a separate category of Independence, based upon literature in the area. Mature for Age was a 7th category, also based upon literature in the field. In all, these authors developed 14 categories for coding responses. Parents were interviewed in their homes or in preschool settings. The number of child descriptors ranged from 2184 (USA) to 9744 (Greece). After tabulating all ratings, the authors determined that only the first six categories were meaningful (the five factors of the FFM plus Independence), with contributions by other categories being negligible. For example, in the US sample, 29.5% of the descriptors were put into the Extraversion category, 17.8% in Agreeableness, 21.2% in Openness, and only 1.2% in Independence. The remaining eight categories combined covered only 14.4% of the descriptors. The same pattern held for the other six countries. It is interesting to note that in all seven countries the 6th category, Independence, was lowest in frequency, ranging from a high of 5.9% to a low of 1.2%. Thus, one could argue that the 'Big 5' covered more than 80% of the descriptors and that the remaining nine categories offered little additional information.

The downward age extension of the FFT has naturally raised fundamental questions regarding the relationship between personality and temperament. The traditional distinction between innate tendencies and acquired characteristics fails in the face of abundant and increasing evidence that the five major personality factors themselves, as well as narrower underlying facets, are best seen as basic tendencies, or innate dispositions (McCrae *et al*., 2000). Thus, an increasing number of researchers are focusing on the similarities, differences, and relative utility of temperament concepts versus personality concepts. McCrae *et al*. suggest, albeit indirectly, these two broad conceptual systems may be largely redundant. That is, one may subsume the other. In their proposition to extend the five-factor 'model', essentially a hierarchical taxonomy of traits with vast empirical support, into a fully developed theory of personality, McCrae and Costa (1996) present the five personality domains as basic tendencies, without the need for additional constructs associated with temperament.

DOI: 10.1002/icd

De Pauw, Mervielde, and Van Leeuwen (2009) recently reported a significant study addressing these issues. Using 443 preschool children, they evaluated relationships among three temperament models and one five-factor model, and how these various traits related to problem behaviours in childhood. Temperament traits reflected the Thomas and Chess (1977) model, the Buss and Plomin (1975) model, and the Rothbart model (e.g. Rothbart & Bates, 2006). The specific five-factor model they employed is based on the work of Mervielde and De Fruyt (2002) and includes 18 hierarchically arranged facets grouped under the familiar 'Big 5' domains. Problematic behaviours were assessed with the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000). The 28 temperament and 18 personality traits were subjected to joint factor analysis, yielding six broad factors. Four of these 'super-factors' very closely resemble their counterparts in the Big 5, and the fifth, labelled 'Sensitivity', bears some resemblance to the Openness factor of the Big 5. (The 6th factor was labelled Activity, a component included within the Extraversion domain in most five-factor models.) De Pauw *et al*. then regressed problem-related scores from the CBCL onto groups of scales representing each of the three temperament models, the five-factor model, and the jointly produced six-factor model. While all four individual trait models yielded significant correlations with the CBCL scores, combining the scales into a six-factor solution resulted in a significant increase in variance explained.

An increasing number of studies reflect the application of the five-factor model to the preschool age group (Abe & Izard, 1999; Asendorpf & Denissen, 2006; De Pauw *et al*., 2009; Halverson *et al*., 2003; Zupancic, Podlesek, & Kavcic, 2006). The five factors have been described in children as young as 2, and a growing body of evidence supports the individual differences in preschoolers can appropriately be considered as personality traits (see, for example, Caspi & Shiner, 2006).

Because a number of different temperament models have been available for several decades, well-established measurement instruments are available to researchers. In contrast, because the use of personality models in this age group is much more recent, there are very few systematic, objective instruments available to measure personality traits in preschoolers. One notable exception is an instrument under development by Halverson *et al*. (2003), the Inventory of Child Individual Differences. One purpose of the present exploratory study is to examine the relationships between temperament, using a well-established theoretical system and objective rating form (the CBQ; Rothbart & Derryberry, 1981), and personality, using a preliminary version of a new five-factor rating form, the M5-PreSchool version (M5-PS; Grist & McCord, 2006), in a sample of preschool-aged children. A second purpose is to provide correlational data for additional development of the M5-PS. Briefly, the M5-PS currently includes 90 items presented in a 5-point Likert-type scale. Parents or preschool teachers rate the child on each item, with the scale labels ranging from Very Inaccurate to Very Accurate. There are 18 items representing each of the five factors of the FFT: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. Primary predictions are that the temperament domain of Surgency will correlate positively with Extraversion, the temperament domain of Negative Affect will correlate positively with Neuroticism, and Effortful Control will correlate positively with Conscientiousness. Secondary correlations are also anticipated. For example, Surgency includes the characteristic of impulsivity, which should correlate negatively with Conscientiousness. Negative Affect is described as including subtraits that may correlate negatively with Agreeableness (e.g. soothability).

DOI: 10.1002/icd

METHOD

Participants

One hundred twenty-two preschool children served as participants. Their teachers were the informants and were asked to rate children on measures of personality and temperament. Children were from a variety of socio-economic levels and from several locations in western North Carolina. The ages of children ranged from 35 to 72 months, with a mean of 50.91 and standard deviation of 7.14. There were 61 males and 61 females. Regarding ethnicity, 90 were identified as white, 16 Hispanic, 3 Asian American, 2 African American, 1 Native American, 2 Other, and 8 no response.

Materials

M5-PS

Preschool teachers completed the M5-PS, a 90-item personality measure designed to provide reliable and valid measurement of the five factors of the FFM in 3- and 4-year-old children. The M5-PS items were derived from Goldberg's (1999) International Personality Item Pool (IPIP). Briefly, this set of more than 2000 items allows researchers to construct non-copyrighted, freelyavailable 'proxy' scales that are quite comparable to established, published, and copyrighted personality instruments. These items are short, clearly worded, easily translated into other languages, and expressed in implied first-person (e.g. 'Worry a lot', 'Make friends easily'). Although the reading level is suitably modest, the item content is geared towards adult and adolescent populations. The goal of developing the M5-PS is to create an objective questionnaire targeting the five core personality traits of the FFM that is suitable for the preschool population. Thus, from the full IPIP item set, the 336 items that comprise proxies of Costa and McCrae's (1992b) NEO-PI-R were extracted. Each of the 336 items was considered for re-wording and inclusion in the M5-PS. If the item was deemed relevant and appropriate in assessing a preschool child, it was re-worded into third-person form and retained on the experimental form of the questionnaire. For example, 'Worry about things' was retained as 'Worries about things'. 'Have a vivid imagination' was retained as 'Has a vivid imagination'. Many items were simply not suitable or modifiable for this age group, such as 'Believe in the importance of art', 'Pay my bills on time', and 'Tend to vote for conservative political candidates'. This process yielded 158 items for possible use on a final scale. The next step was to have a panel of judges rate these items for 'relevance' for assessing a preschool child. The panel consisted of a group of parents of children in this age group ($n = 10$), a group of preschool teachers and assistant teachers ($n = 10$), and a group of university faculty in the field of birth-to-kindergarten education ($n = 6$). Each panel member rated each of the 158 items on a 5-point Likert-type scale ranging from Totally Irrelevant to Very Relevant, with a neutral mid-point. This step resulted in a rank ordering of the 158 items with regard to perceived relevance. A combination of empirical and rational approaches was used to select the best items from the 158. First, items needed to have an average relevance rating of greater than neutral (>3.0). Second, we wanted to select the most relevant items, but to include about the same number of items for each of the five trait scales. (We tentatively retained the original factor association for each item from the IPIP.) This approach yielded the current 90-item set, with 18 items for each personality factor. Table 1 includes three sample items

DOI: 10.1002/icd

Table 1. Sample items for each of the M5-PS scales

Extraversion
'Makes friends easily'
'Is always busy'
'Radiates joy'
Agreeableness
'Trusts others'
'Is easy to satisfy'
'Is indifferent to the feelings of others'
Conscientiousness
'Completes tasks successfully'
'Breaks rules'
'Jumps into things without thinking'
Neuroticism
'Worries about things'
'Gets angry easily'
'Is easily intimidated'
Openness to experience
'Has a vivid imagination'
'Likes music'
'Experiences emotions intensely'

for each factor. Scores are obtained for Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. The 18 items measuring each factor are intermixed, with about half reverse-scored, and the scoring rubric is a 5-point Likert-type scale ranging from Very Accurate to Very Inaccurate.

Rothbart Childhood Behaviour Questionnaire—very short form (CBQ)

Preschool teachers also completed the CBQ, a temperament measure designed to assess three dimensions: Surgency, Negative Affect and Effortful Control. These scales have consistently emerged during factor analysis from the standard form of the CBQ (Putnam & Rothbart, 2006; Rothbart, Ahadi, Hersey, & Fisher, 2001). Putnam and Rothbart (2006) report acceptable internal reliability for the CBQ, with alphas of 0.75 for Surgency, 0.72 for Negative Affect, and 0.74 for Effortful Control.

Design and procedure

Materials were delivered in packets to the preschool teachers who agreed to participate in the study. The two questionnaires were arranged in counterbalanced order. Teachers were given approximately 2 weeks to complete ratings of all children in their classrooms.

RESULTS

Table 2 exhibits means, standard deviations, and Cronbach's alphas for the five scales of the M5-PS (and the three CBQ scales as well). Alpha levels for Extraversion (0.81), Conscientiousness (0.88), and Neuroticism (0.85) are very good, and are quite comparable to those of the already well-documented CBQ scales. The alpha for the Agreeableness scale (0.71) is in the acceptable range. However, the alpha for the Openness to Experience scale, 0.31, is well below acceptable levels.

DOI: 10.1002/icd

Table 2. Means, standard deviations, and alphas for all scales

Scale	*n*	M	SD	α
M5-PS				
Extraversion	122	3.61	0.54	0.805
Agreeableness	122	3.27	0.50	0.708
Conscientiousness	122	3.25	0.72	0.882
Neuroticism	122	2.70	0.67	0.854
Openness	122	3.25	0.33	0.312
CBQ				
Surgency	121	4.56	1.05	0.819
Negative affect	121	4.23	0.84	0.748
Effortful control	121	5.10	1.11	0.872

Note: Means are expressed as average item rating. The M5-PS items are rated on a 5-point Likert-type scale. The CBQ items are rated on a 7-point Likert-type scale.

Table 3. Intercorrelations between M5-PS personality scales

Scale	E	A	C	N	O
Extraversion	—	−0.08	0.08	−0.29**	0.35**
Agreeableness		—	0.58**	−0.68**	0.37**
Conscientiousness			—	−0.38**	0.57**
Neuroticism				—	−0.36**
Openness					—

$n = 122$ for all correlation coefficients.
**Significant at 0.01 level; *significant at 0.05 level.

Intercorrelations among the five M5-PS scales are presented in Table 3. A pattern of statistically significant but relatively low correlations among the five factors is typically found in studies using the FFM (see, for example, Donnellan, Oswald, Baird, & Lucas, 2006). Current results do show a somewhat higher than normal correlation between Agreeableness and Conscientiousness (0.58), and Agreeableness and Neuroticism (−0.68). Hopefully, further scale refinement will improve specificity. Table 4 presents intercorrelations among the CBQ scales; these are quite consistent with previous reports.

Finally, Pearson correlations were computed between the five personality factors (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience) and the three temperament factors (Surgency, Negative Affect, and Effortful Control). Key results are presented in Table 5. The temperament factor Surgency correlated strongly and positively with Extraversion, with more modest but still significant correlations with Agreeableness and Conscientiousness (both in the negative direction). The temperament factor Negative Affect was highly correlated (positively) with Neuroticism and also correlated (negatively) with Agreeableness. The temperament factor Effortful Control correlated strongly and positively with Conscientiousness. A statistically significant but weak positive correlation was found between Effortful Control and Openness, though the very low internal consistency exhibited by the Openness scale makes this result uninterpretable.

DOI: 10.1002/icd

Table 4. Intercorrelations between CBQ temperament scales

Scale	S	NA	EC
Surgency	—	−0.06	−0.29**
Negative affect		—	0.17
Effortful control			—

$n = 121$ for all correlation coefficients.
**Significant at 0.01 level; *significant at 0.05 level.

Table 5. Correlations between temperament and personality scales

Scale	S	NA	EC
Extraversion	0.59**	−0.11	0.03
Agreeableness	−0.32**	−0.44**	0.16
Conscientiousness	−0.36**	−0.04	0.54**
Neuroticism	−0.13	0.65**	0.04
Openness	0.01	−0.08	0.20*

$n = 121$ for all correlation coefficients.
**Significant at 0.01 level; *significant at 0.05 level.

DISCUSSION

These results demonstrate a pattern of significant and logical relationships between temperament characteristics and personality characteristics in this sample of very young children. From the standpoint of traditional temperament models, Surgency is very well represented by the personality trait of Extraversion, Negative Affect is very well represented by the personality trait of Neuroticism, and Effortful Control is very well represented by the personality trait of Conscientiousness. From a broad perspective, these models appear to be overlapping and even redundant.

The pattern of intercorrelations among the Big 5 factors in the current study (Table 3) is reasonably consistent with other reports in the FFT literature, if we ignore the significant positive correlations between the O factor and each of the other factors as spurious (due to low internal consistency of the O scale itself). See, for example, the correlations reported in the NEO-PI-R manual (Costa & McCrae, 1992b). Most notably, the N scale correlates significantly and negatively with E, A, and C, which is consistent with most published reports.

Closer inspection of data in Table 5 raises some interesting points. For example, children who obtained higher scores on the temperament scale of Surgency also exhibited more irritability and less conscientiousness than children scoring lower on Surgency, a pattern that is not evident from the temperament perspective alone. Similarly, children with higher scores on Negative Affect, while not surprisingly obtaining higher scores on Neuroticism, also obtained significantly lower scores on Agreeableness. The personality model provides a more differentiated picture of a given child, with possibly relevant implications for classroom and general adaptation.

This raises a larger issue. Are temperament models and personality models really addressing the same conceptual elements of individual differences, and do

DOI: 10.1002/icd

we really need both models? Our results are consistent with other recent findings in suggesting that the FFT is a fully adequate system for describing individual differences in young children as well as adults (Caspi, Roberts, & Shiner, 2005; Mervielde & Asendorpf, 2000; Rothbart & Bates, 2006; Shiner & Caspi, 2003). Indeed, we would say that the FFT subsumes extant models of temperament. And there are strong conceptual and practical advantages to using the same theoretical model to describe individual differences in people of all ages. In this latter point, we support Caspi and Shiner's (2006) call for a 'common taxonomy' to describe individual differences from the preschool age range through adulthood.

The primary weakness in the current study is the poor internal reliability of the Openness to Experience scale on the M5-PS. An alpha level of 0.312 is far below the acceptable level for any use of a scale. Clearly, the 18-item set currently comprising the Openness scale lacks coherence and homogeneity. Low internal consistency for the Openness factor has also been reported by other researchers using different methods of measuring the Big 5 (Caspi & Shiner, 2006; Lamb, Chuang, Wessels, Broberg, & Hwang, 1996). On a conceptual level, most people would accept the proposition that young children do exhibit variation in a trait parallel to Openness in adults; for example, curiosity and exploratory behaviour are well-researched patterns in this age group. Empirically, the Kohnstamm *et al*. (1998) study described above clearly revealed the existence of Openness in young children. In free-response protocols, most parents include comments about their child's intellectual abilities, curiosity, creativity, and openness to exploratory behaviour (Mervielde, Buyst, & De Fruyt, 1995). Thus, the low internal consistency, and the generally weak correlation with other measures found in the current study, may reflect a poor measure of Openness rather than poor theory.

Our data, in the context of recent research on personality in preschool children, clearly support the usefulness of the FFT in this age group. A major problem is the lack of reliable, valid, and practical measurement instruments. The current M5-PS data show promise, though clearly additional scale development is needed. Next steps will be to gather enough data to conduct factor analyses (exploratory and confirmatory) to identify good and poor items, revising the current 90-item version to a shorter, more focused questionnaire.

REFERENCES

Abe, J. A. A., & Izard, C. E. (1999). A longitudinal study of emotion expression and personality relations in early development. *Journal of Personality and Social Psychology, 77*, 566–577.

Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA preschool forms & profiles*. Burlington, VT: University of Vermont, Department of Psychiatry.

Asendorpf, J. B., & Denissen, J. J. A. (2006). Predictive validity of personality types versus personality dimensions from early childhood to adulthood: Implications for the distinction between core and surface traits. *Merrill-Palmer Quarterly—Journal of Developmental Psychology, 52*, 486–513.

Buss, A. H., & Plomin, R. (1975). *A temperament theory of personality development*. New York: Wiley.

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology, 56*, 453–484.

Caspi, A., & Shiner, R. L. (2006). Personality development. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp. 300–364). New York: Wiley.

Costa, P. T., & McCrae, R. R. (1992a). Four ways five factors are basic. *Personality and Individual Differences, 13*, 653–665.

DOI: 10.1002/icd

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

Costa, P. T., & McCrae, R. R. (1994). Stability and change in personality from adolescence through adulthood. In C. F. Halverson, G. A. Kohnstamm, & R. P. Martin (Eds.), *The developing structure of temperament and personality from infancy to adulthood*. Hillsdale, NJ: Erlbaum.

De Pauw, S. S. W., Mervielde, I., & Van Leeuwen, K. G. (2009). How are traits related to problem behavior in preschoolers? Similarities and contrasts between temperament and personality. *Journal of Abnormal Child Psychology, 37*, 309–325.

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. In M. R. Rosenzweig & L. W. Porter (Eds.), *Annual Review of Psychology* (Vol. 41, pp. 417–440). Palo Alto, CA: Annual Reviews.

Digman, J., & Shmelyov, A. (1996). The structure of temperament and personality in Russian children. *Journal of Personality and Social Psychology, 7*, 341–351.

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The mini-IPIP scales: Tiny-yet-effective measures of the big five factors of personality. *Psychological Assessment*, *18*(2), 192–203.

Goldberg, L. R. (1993). The structure of phenotypic personality traits. *American Psychologist*, *48*, 26–34.

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory. Measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality Psychology in Europe* (Vol. 7, pp. 7–28). Tilburg, The Netherlands: Tilburg University Press.

Goldsmith, H. H., Buss, A. H., Plomin, R., Rothbart, M. K., Thomas, A., Chess, S., *et al*. (1987). Round-table—What is temperament? 4 approaches. *Child Development*, *58*, 505–529.

Gosling, S. D., & John, O. P. (1999). Personality dimensions in nonhuman animals: A cross-species review. *Current Directions in Psychological Science*, *8*, 69–75.

Grist, C. L., & McCord, D. M. (2006). *M5-PS Questionnaire*. Available from the first author upon request (clgrist@wcu.edu).

Halverson, C. F., Havill, V. L., Deal, J., Baker, S. R., Victor, J. B., Pavlopoulos, V., *et al*. (2003). Personality structure as derived from parental ratings of free descriptions of children: The Inventory of Child Individual Differences. *Journal of Personality, 71*, 995–1026.

Kohnstamm, G. A., Halverson C. F., Jr., Mervielde, I., & Havill, V. L. (1998). *Parental descriptions of child personality*: *Developmental antecedents of the Big Five*. London: Lawrence Erlbaum.

Lamb, M., Chuang, S., Wessels, H., Broberg, A., & Hwang, C. (1996). Emergence and construct validation of the Big Five factors in early childhood: A longitudinal analysis of their ontogeny in Sweden. *Child Development*, *73*, 1517–1524.

McCrae, R. R., & Costa, P. T. (1996). Toward a new generation of personality theories: Theoretical contexts for the Five-Factor Model. In J. S. Wiggins (Ed.), *The Five-Factor Model of personality*: *Theoretical perspectives*. New York, NY: Guilford Press.

McCrae, R. R., Costa, P. T., Hrebickova, M., Ostendorf, F., Angleitner, A., Avia, M. D., *et al*. (2000). Nature over nurture: Temperament, personality, and life span development. *Journal of Personality and Social Psychology, 78*, 173–186.

Mervielde, I., & Asendorpf, J. B. (2000). Variable-centered versus person-centered approaches to childhood personality. In S. E. Hampson (Ed.), *Advances in personality psychology* (Vol. I, pp. 37–76). Philadelphia: Taylor & Francis.

Mervielde, I., Buyst, V., & De Fruyt, F. (1995). The validity of the Big-5 as a model for teachers ratings of individual-differences among children aged 4–12 years. *Personality and Individual Differences*, *18*, 525–534.

Mervielde, I., & De Fruyt, F. (2002). Assessing children's traits with the hierarchical personality inventory for children. In B. De Raad & M. Perugini (Eds.), *Big five assessment* (pp. 129–146). Seattle: Hogrefe & Huber.

Putnam, S. P., & Rothbart, M. K. (2006). Development of short and very short forms of the Children's Behavior Questionnaire. *Journal of Personality Assessment*, *87*, 102–112.

Rothbart, M. K. (2007). Temperament, development, and personality. *Current Directions in Psychological Science*, *16*, 207–212.

DOI: 10.1002/icd

Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: Origins and outcomes. *Journal of Personality and Social Psychology, 78*, 122–135.
Rothbart, M. K., Ahadi, S. A., Hersey, K. L., & Fisher, P. (2001). Investigations of temperament at three to seven years: The Children's Behavior Questionnaire. *Child Development*, *72*, 1394–1408.
Rothbart, M. K., & Bates, J. E. (2006). Temperament. In W. Damon, R. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology*: *Vol. 3. Social, emotional, and personality development* (6th ed., pp. 99–166) New York: Wiley.
Rothbart, M. K., & Derryberry, D. (1981). Development of individual differences in temperament. In M. E. Lamb & A. L. Brown (Eds.), *Advances in developmental psychology.* Hillsdale, NJ: Erlbaum.
Shiner, R., & Caspi, A. (2003). Personality differences in childhood and adolescence: measurement, development, and consequences. *Journal of Child Psychology and Psychiatry 44*, 2–32.
Strelau, J. (1987). The concept of temperament in personality research. *European Journal of Personality, 1*, 107–117.
Thomas, A., & Chess, S. (1977). *Temperament and development*. New York: Brunner/Mazel.
Zupancic, M., Podlesek, A., & Kavcic, T. (2006). Personality types as derived from parental reports on 3-year-olds. *European Journal of Personality, 20*, 285–303.

DOI: 10.1002/icd