Available online at www.sciencedirect.com
ScienceDirect
ELSEVIER
Personality and Individual Differences 41 (2006) 1503–1513
PERSONALITY AND INDIVIDUAL DIFFERENCES
www.elsevier.com/locate/paid

Children's behavioral patterns, the Five-Factor model of personality, and risk behaviors

Charlotte N. Markey [a,*], Patrick M. Markey [b], Andrea J. Ericksen [c], Barbara J. Tinsley [d]

[a] *Rutgers University, Department of Psychology, 311 North 5th Street, Camden, NJ 08102, United States*
[b] *Villanova University, United States*
[c] *San Juan College, United States*
[d] *Arizona State University, United States*

Received 24 January 2006; received in revised form 8 May 2006; accepted 5 June 2006
Available online 14 August 2006

Abstract

Although relations between children's personality and health behaviors have been identified, previous research has relied primarily on survey assessments. The present study used behavioral observations to examine children's ($n = 94$, mean age = 10.07 years) behavioral patterns in relation to their participation in risk behaviors 1 year later. Results contribute to previous reports linking specific personality traits to children's likelihood of participation in risky behaviors. Specifically, girls' participation in risky behavior was related to the expression of behavioral patterns associated with neuroticism, introversion, and disagreeableness, while boys participation in risk behaviors was related to behavioral patterns associated with extraversion and disagreeableness. Findings are discussed in terms of their potential for contributing to health promotion efforts aimed at identifying children most at risk for adopting unhealthy behaviors.

Keywords: Risk behaviors; Personality; Five-Factor model; Behavioral observations

* Corresponding author. Tel.: +1 856 225 6332.
E-mail address: chmarkey@camden.rutgers.edu (C.N. Markey).

0191-8869/$ - see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.paid.2006.06.007

1. Introduction

Adolescence is often thought of as a developmental period characterized by experimentation and risky behaviors. However, empirical research indicates that risky behaviors are not necessarily normative; there are significant individual differences in children's and adolescents' participation in risky behaviors (Arnett, 1999; Chassin & DeLucia, 1996). It is important to identify which children are vulnerable to participation in health-compromising behaviors because evidence suggests that mortality and morbidity during childhood and adolescence is highly associated with risk behaviors (Cob, 1998; Millenstein & Litt, 1993). Participation in health-compromising behaviors including cigarette smoking, alcohol consumption, marijuana use, and early sexual behaviors may not only pose risks to children's health but may lead to an unhealthy pattern of behaviors that extends into adolescence and adulthood (Jessor, 1998; US Department of Health and Human Services [USDHHS], 2000a, 2000b).

1.1. Personality as a predictor of risky behaviors

Research examining relations between personality and health behaviors has identified personality qualities that may render young people vulnerable to participation in risk behaviors (e.g., John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994; Markey, Ericksen, Markey, & Tinsley, 2001). In particular, our past research and that of others has linked the broad personality traits included in the Five-Factor Model of personality (FFM; neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) to children's and adolescents' participation in risky behaviors (Gullone & Moore, 2000; Markey et al., 2001; Markey, Markey, & Tinsley, 2003). Extraversion (activity level, sociability and dominance) has been associated with externalizing behaviors and delinquency (e.g., John et al., 1994). Agreeableness (kindness, likeability, and trustworthiness) appears to be negatively associated with risky behaviors and delinquency among youths (John et al., 1994; Markey et al., 2001; Markey et al., 2003). Conscientiousness (organization, reliability and impulse control) has been negatively related to youths' deviant and unhealthy behaviors (Gullone & Moore, 2000; John et al., 1994; Markey et al., 2001; Markey et al., 2003). Openness to experience (originality, intellect, and creativity) has been demonstrated to positively relate to risk behaviors among early-maturing adolescent girls (Markey et al., 2003). Neuroticism (emotional instability, anxiety, and sadness) has been associated with psychological health problems (i.e., depression; Markey, 2002), but has not emerged as a consistent predictor of youths' health behaviors (Gullone & Moore, 2000; John et al., 1994; Markey et al., 2001).

1.2. Behavioral observations and risky behaviors

In research linking the FFM and children's and adolescents' risky behaviors, survey instruments have been used almost exclusively as measures of personality. For example, using a questionnaire, John et al. (1994) found that boys rated as extraverted tended to report participating in externalizing behaviors more often than did boys rated as introverted. Thus, it seems likely that youths who engage in externalizing behaviors might also exhibit *observable* behaviors related to extraversion (e.g., talkativeness, dominance, etc.). To date, the validity of this assumption has

not been empirically demonstrated; research examining relations between the FFM and risk behaviors has failed to explore the link between observed interpersonal behaviors and youths' participation in risky behaviors.

When links between childhood observations and later health risks have been observed, the classification schema provided by the FFM is not usually employed. Block and Block's longitudinal study of personality is perhaps most well known for its inclusion of behavioral observations throughout the course of the participants' development. For example, behavioral assessments of personality when children were 7 and 11 years of age were associated in meaningful ways with these participants' drug use at age 18 (Shelder & Block, 1990). The Blocks' research has yielded a wealth of valuable information about personality development and adjustment (e.g., Block & Robins, 1993), but the investigators' philosophical objections to the FFM as a classification schema (see Block, 2001) has left this work devoid of links between behavioral assessments of the FFM and youths' risky behaviors. Caspi and colleagues have verified the utility of behavioral observations in children as young as 3 years of age in predicting critical adolescent and adult outcomes including adjustment in interpersonal relationships, unsafe sexual behaviors, psychiatric problems, criminal behaviors, and alcohol dependence (e.g., Caspi, Moffitt, Newman, & Silva, 1998; Newman, Caspi, Moffitt, & Silva, 1997). However, because this research has examined preschoolers' individual differences (often referred to as temperament and including characteristics such as "undercontrolled") it also has not utilized behavioral assessments of the FFM as predictors of health outcomes.

A logical extension of this research is an examination of children's behavioral observations, quantified using the language provided by the FFM, in relation to children's participation in risk behaviors. Behavioral observations have the potential to remedy some of the limitations inherent in survey research (e.g., self-enhancement, deception, halo effects, and relations attributable to shared method variance) and are more easily generalized to "real life" social interactions. Of course, it is unlikely that any single behavior would be particularly useful for predicting participation in risk behaviors or assessing the FFM because broad personality traits such as the FFM are conceptualized as manifesting themselves as a general *pattern* of behavior (Funder, 1999; Markey, Markey, & Tinsley, 2004). However, a strategy of linking the FFM to children's participation in risky behaviors through the simultaneous examination of a variety of interpersonal behaviors has the potential to be most efficacious and likely to reveal the extent to which the typical behavioral pattern of children who engage in risky behaviors can be quantified using the structure provided by the FFM.

1.3. Aims of the present study

The present study extends prior research investigating links between personality and health-related behaviors among youths by examining relations among a behavioral assessment of children's FFM personality traits and participation in risk behaviors. Specifically, children's interpersonal behavioral patterns when interacting with their parents are assessed by unacquainted judges and analyzed to determine the typical behavioral pattern of children who participate in risk behaviors 1 year later. Next, these behavioral patterns are examined to determine the extent to which they can be quantified using the structure provided by the FFM. These analyses

permit the examination of the patterns of behaviors exhibited by children who engage in risky behaviors and the relations between these behavioral patterns and the personality traits included in the FFM.

2. Method

2.1. Participants

Children ($n = 94$) participated in this study when they were in fourth and fifth grade ($M = 10.07$ years and 10.87 years, respectively) as part of a longitudinal study examining children's health and development. Approximately half of the children were female (43%) and half were male (57%). Both mothers and fathers were invited to participate in the study with their child, and at least one parent was required to complete the study. In 51 (54%) families, both parents participated in the study, and in 43 (46%) only the mother participated. The children and families in this sample were ethnically and socioeconomically diverse, with ethnicities similar to the population residing in the southwest US, where the study was executed (Euro-American = 53.7%, Mexican American = 46.3%).

2.2. Measures and procedures

2.2.1. Behavioral observations

Participating children and parents worked together to complete a task during a laboratory visit; these interactions were video-taped with the participants' knowledge. Instructions to children and their parent(s) indicated that they should cooperatively create a "health graph" for the child with the supplies provided (markers, paper, etc.). This health graph project provided an opportunity for families to discuss the health-related life experiences of the child participating in the project and document the most notable events (e.g., coping with chicken pox; see Markey et al., 2004 & Markey et al., Markey, Markey, & Tinsley, 2005 for additional information about this behavioral observation). During these interactions, none of the participating children or their parents discussed children's participation in the risk behaviors examined in this study.

2.2.2. Coding behaviors

The children's behaviors during the health graph interaction task were coded using a 63 item version of the Riverside Behavioral Q-Sort (RBQ; Funder, Furr, & Colvin, 2000) suitable for use with children. Because the RBQ was originally created and validated for coding the behaviors of adults as they interact with unrelated partners, the wording of some items was modified for use with the current sample. Mainly, the RBQ items were revised to indicate that the individual(s) the children interacted with were "parent(s)" instead of "partner(s)". Additionally, the item "Expresses sexual interest" was not utilized because it was not relevant to the current interaction (for more information about these behavioral ratings, see Markey et al., 2004; Markey et al., 2005.) The remaining 63 RBQ items were designed to measure behaviors at a level of generality between narrowly defined motor activities and more abstract styles of behavior (e.g., "Seems likeable", "Exhibits social skills"). Each item was written on a card, and two judges described chil-

dren's behaviors by sorting the cards into a forced choice, quasi-normal distribution. Judges rated the behaviors of all children after viewing 5 min of the taped family interactions. Coders placed cards in one of nine categories indicating the degree to which the item is characteristic of the behaviors exhibited by children (category 1 = extremely *un*characteristic to category 9 = extremely characteristic). The average inter-rater reliability of the single RBQ items was .55, which is slightly higher than the rater agreement typically found when assessing adult behavior with the RBQ (Funder et al., 2000). In lieu of examining single behaviors, the behavioral *patterns* that children expressed during an interaction are examined in the present study. In order to compute the rater agreement for a particular child's behavioral pattern, the 63 RBQ scores provided by the first rater were correlated with the 63 RBQ scores provided by the second rater. Using this procedure, the mean judge reliability of the 94 children's behavioral patterns was .86, indicating that raters had fairly high agreement concerning the general behavioral pattern expressed by each child. These reliabilities are higher than the internal consistencies typically found using children's self-reports on FFM measures (e.g., Markey et al., 2003; Markey, Markey, Tinsley, & Ericksen, 2002) and are comparable to the reliability of parental reports of their children's personality using the FFM (e.g., John et al., 1994; Markey et al., 2002).

2.2.3. The hypothesized behavioral patterns of the FFM

To quantify the behavioral patterns observed using the RBQ in the language provided by the FFM, it was necessary to hypothesize how each of the 63 behaviors of the RBQ are related to the FFM. Research by Eaton and Funder (2000) has identified which RBQ behaviors individuals tend to conceptualize as relevant to the traits within the FFM. In this previous study, six judges were provided with descriptions of each of the five traits included in the FFM, and were asked to use the RBQ five separate times to Q-sort the behaviors they predicted a prototypical individual might perform (e.g., the prototypical agreeable person, the prototypical extravert, etc.). Judges Q-sorted the behaviors of prototypical individuals for all five traits (average inter-judge reliability = .93). Thus, Eaton and Funder's (2000) results provide information regarding an ordered pattern of behaviors predicted for each of the five traits included in the FFM. In other words, these data provide a hypothesized ordering of behaviors (from most likely to least likely) that a person will perform who is judged high on a given trait. This information will be used in subsequent analyses to examine the extent to which the behavioral pattern of children who participated in risky behavior is similar to the hypothesized behavioral patterns of neurotic, extraverted, open, agreeable, or conscientious individuals.

2.2.4. Risk behavior assessment

Children completed the risk behavior assessment when they were in fifth grade (1 year after the video-taped interactions) This instrument was designed for this study to assess children's participation in health-compromising or risky behaviors (see Markey, 2002; Markey et al., 2001; Markey et al., 2003; Markey et al., 2005 for more information about this measure). Health-compromising behaviors assessed includes smoking, alcohol consumption, marijuana use, and kissing (conceptualized as a ''gateway'' to sexual activity). For these four items, children indicated whether or not they had ever participated in each of the behaviors. All responses were summed and an overall measure of health-compromising behaviors was created ($\alpha = .60$). In the current sample, 44% of children reported participating in *at least one* of the risk behaviors; 9% had

smoked a cigarette, 22% had tried alcohol, 4% had smoke marijuana, and 21% had kissed a non-related member of the opposite sex.

3. Results

A two-step approach was utilized in order to ascertain the extent to which the behavioral pattern of children who participated in risky behavior was similar to the hypothesized behavioral patterns of neurotic, extraverted, open, agreeable, or conscientious individuals. In the first step the Pearson correlations between boys' and girls' 63 observed interpersonal behaviors and their participation in risky behaviors were computed. The resulting 63 correlations for boys and the 63 correlations for girls provide information regarding which types of behaviors children who engaged in risky behaviors were likely (i.e., positive correlations) or unlikely to perform (i.e., negative correlations) during interactions with their parents. In other words, these analyses provide information regarding the observed pattern of behavior expressed by boys and girls who engaged in risky behavior. (A complete list of the hypothesized behavioral patterns for each trait of the FFM and the observed behavioral patterns of boys and girls who engaged in risky behavior are available from the authors.) In the second step, the fit of these observed patterns of behavior to the hypothesized behavioral patterns of each FFM trait were evaluated by computing *r*-alerting coefficients for boys and girls (Rosenthal, Rosnow, & Rubin, 2000; Westen & Rosenthal, 2003). These coefficients are computed by correlating the 63 Pearson *r* values for boys and girls produced in step one (indicating how each children's RBQ behavior was related to each risk behavior) with the judges' hypothesized relations of that behavior to a trait of the FFM. In other words, the *r*-alerting represents the simple correlation between (a) the pattern of correlations between the 63 RBQ interpersonal behaviors and children's risky behaviors, and (b) the pattern of the judges' hypothesized relations of the 63 RBQ behaviors to a trait of the FFM. Using this procedure, a high positive r-alerting for a specific trait suggests that the pattern of behavior exhibited by a child who engaged in risk behaviors were similar to the pattern of behaviors hypothesized to be exhibited by an individual high on the corresponding trait. Previous research suggests that such an analysis

Table 1
Randomization tests of *r*-alerting values examining the similarity between the behavior patterns of children who engaged in risky behavior and the behavior patterns related to the Five-Factor Model

	Trait	*r*-Alerting	*N*-permutations	$N >$ than $\lvert r\text{-alerting}\rvert$	*p*-value
Girls	Extraversion	−.36	500,000	1771	.004
	Agreeableness	−.52	500,000	6	<.001
	Conscientiousness	−.27	500,000	15,454	.031
	Neuroticism	.56	500,000	1	<.001
	Openness	−.22	500,000	29,478	.059
Boys	Extraversion	.37	500,000	1542	.003
	Agreeableness	−.32	500,000	5339	.011
	Conscientiousness	.19	500,000	66,702	.133
	Neuroticism	−.05	500,000	346,349	.693
	Openness	−.11	500,000	187,251	.375

provides an easily interpretable means of linking behavioral patterns and profiles to various traits (e.g., Funder & Sneed, 1993; Markey & Markey, 2006; Markey et al., 2004). Table 1 displays the *r*-alerting coefficients for each trait for both boys and girls.

Since the RBQ is an ipsative measure, the dependency assumption is violated in the above analyses and *p*-values cannot be computed in the traditional manner. However, randomization tests of the correlation coefficients can be conducted, which make no such assumptions about independence. These tests yield an exact probability of obtaining the found *r*-alerting values reported in Table 1 under the null hypothesis that for each trait the 63 behavioral correlations are randomly paired with the 63 FFM judge ratings. Because each behavioral correlation is randomly paired with a FFM judge rating, the expected value of the resulting *r*-alerting value is 0. By repeating this resampling a large number of times, a sampling distribution of *r*-alerting can be created for the situation where the value of ρ is 0.0. In a data set with 63 pairs there are a total of 63! (1.98×10^{87}) possible random resamplings; in the current analysis a subset of 500,000 random pairings were utilized to create the sampling distribution. An exact probability value associated with the initial *r*-alerting values can be computed by dividing the number of times an *r*-alerting from the sampling distribution exceeded the initial *r*-alerting value by 500,000. As can be seen in Table 1 the pattern of behaviors exhibited by girls who engaged in risk behaviors was similar to the hypothesized behavioral pattern of a person who is neurotic, introverted, disagreeable, and to a lesser extent, unconscientious. The pattern of behavior exhibited by boys who engaged in risk behavior was similar to the hypothesized behavioral pattern of an individual who is extraverted and disagreeable.

Next, analyses were conducted in order to determine if the behavioral patterns exhibited by boys and girls were significantly different from each other. In other words, these data were analyzed to determine if the boy and girl *r*-alerting values presented in Table 1 were significantly different from each other. Due to the ipsative nature of the RBQ, randomization tests were again utilized. For each trait, 100,000 of the girl *r*-alerting values (computed using the random samples in the earlier analysis) were randomly paired with 100,000 boy r-alerting values (also yielded in the earlier analysis). The differences between these 100,000 randomly generated pairs of *r*-alerting values served as the sampling distribution to compare the actual differences between girls' and boys' *r*-alerting values presented in Table 1. As before, an exact probability value associated with these differences was computed by dividing the number of times the differences between girls' and boys' *r*-alerting values from the sampling distribution exceeded the observed difference of girls' and boys' *r*-alerting values by 100,000. As shown in Table 2, girls and boys had significantly different *r*-alerting values for the traits of extraversion, conscientiousness, and neuroticism.

Table 2
Randomization tests for comparing girls' and boys' *r*-alerting values

Trait	*r*-Alerting difference	*N*-permutations	$N >$ than |*r*-alerting difference|	*p*-value
Extraversion	−.73	100,000	27	<.001
Agreeableness	−.20	100,000	31,172	.312
Conscientiousness	−.46	100,000	2012	.020
Neuroticism	.51	100,000	996	.009
Openness	−.11	100,000	57,801	.578

Note: The *r*-alerting difference was computed by subtracting the boys' *r*-alerting value from the girls' *r*-alerting value.

4. Discussion

This study extends past research linking personality and health by using observations of children's behavioral patterns, quantified using the language of the FFM, as predictors of their later participation in risky behaviors. The use of behavioral ratings permitted an extension of past research linking children's ratings on survey assessments of the FFM and risk behaviors. Results indicate that girls' risk behaviors were most related to the expression of behaviors associated with neuroticism, introversion, disagreeableness, and low conscientiousness; boys' participation in risk behaviors was most related to the expression of behaviors associated with extraversion and disagreeableness. These findings reveal provocative similarities and differences from the results of past research that has relied primarily on survey (not observed behavioral) data.

The gender differences in behavioral patterns related to risk behaviors have not been previously identified in survey research linking the FFM and youths' health-related behaviors. These findings echo Block's (1993, p. 24) statement from over a decade ago: "I have been profoundly impressed by the differences between the sexes not so much in their respective mean levels on whatever is being measures as in the differences in the *correlational patterns* that characterize males as compared with females" (emphasis added). Although agreeable behaviors were negatively related to both boys' and girls' participation in risky behaviors (consistent with previous research, see Markey et al., 2001; Markey et al., 2003; Shiner, Masten, & Roberts, 2003), conscientious, neurotic, and extraverted behaviors were differently related to girls' and boys' participation in risky behaviors.

Among girls (but not boys), a modest negative relation between conscientiousness and risk behaviors was found. This is somewhat consistent with past research suggesting that conscientiousness is an important predictor of health behaviors; conscientious individuals have been found to take care with their health, avoid participation in health-compromising behaviors, and live longer than their unconscientious peers (Friedman et al., 1995; John et al., 1994; Markey et al., 2001; Markey et al., 2003). Further, girls who exhibited neurotic behaviors were likely to participate in risky behaviors. This finding is consistent with at least one study (see Cooper, Wood, Orcutt, & Albino, 2003) indicating that children's and adolescents' difficulties regulating negative emotions (i.e., a tendency toward neurotic behaviors) may contribute to their participation in risky behaviors. The present study revealed distinct relations between extraverted behaviors and risk behaviors among girls and boys. Consistent with past research indicating that youths who are sociable, outgoing, and dominant are susceptible to participation in risky behaviors (John et al., 1994), associations between extraverted behaviors and risk behaviors were found among the boys in this study. Interestingly, girls who behaved in an introverted manner in this study were susceptible to participation in risk behaviors. It is possible that girls who are susceptible to participation in risk behaviors may be quiet, passive, shy individuals (i.e., introverts) who are confused and anxious (i.e., are emotionally unstable) and thus participate in risk behaviors to receive the approval of their peers or cope with their negative moods (Cooper et al., 2003).

4.1. Conclusion, limitations, and implications

In sum, this study indicates the importance of examining relations between personality and health using observed behavioral patterns, not just survey data. By examining the behavioral pat-

terns of children interacting with their parents, previously unidentified gender differences in relations between personality and risk behaviors were recognized. What may be most striking about these findings is that they are based on behavioral observations lasting only 5 min. After observing these children interacting with their parents for 5 min it was possible to discover the behavioral pattern associated with children who would participate in risk behaviors 1 year later. These results speak to the richness of behavioral data and further provide additional validity for the FFM as a predictor of risk behaviors by linking observable behavioral patterns to risk behaviors.

Of course, the findings from this study should be tempered with an understanding of its limitations, in particular the examination of a relatively modest sample of boys and girls and the use of children's self-reports of their risky behaviors. Replication of these results with larger samples of children and extension of this research through the inclusion of simultaneous personality assessments (e.g., self-report, other-report, and observed behavioral patterns) is suggested. Finally, longitudinal research examining behavioral assessments of personality as predictors of health-related behaviors across many years should contribute to our understanding of personality as an antecedent of risk behaviors.

These findings have implications for parents, educators, and health professionals interested in identifying children most at risk for participating in potentially health-compromising behaviors. Although efforts to improve children's health-related behaviors are limited in the current health care climate, school and pediatric-based educational programs usually focus on anticipatory guidance strategies instructing children and their parents about the importance of avoiding health-compromising behaviors (e.g., drug use). The findings from the present study suggest that efforts in these areas may be enhanced by knowledge of children's personalities. By identifying children who exhibit a behavioral pattern that places them at risk for health-compromising behaviors, it may be possible to make progress towards helping children change the patterns of behaviors that may limit their potential for a healthy adolescence and adulthood.

Acknowledgements

This research was funded by grant #HD32465-02 from the National Institute of Child Health and Development awarded to the fourth author. In addition, the first author was supported during the writing of this manuscript by a grant from the Robert Wood Johnson Foundation awarded to the Center for State Health Policy at Rutgers University, New Brunswick. The authors would like to thank Daniel Hart for his helpful comments regarding an earlier draft of this manuscript. Correspondence concerning this article should be addressed to Charlotte N. Markey, Department of Psychology, Rutgers University, 311 N. Fifth Street, Camden, NJ 08102; chmarkey@camden.rutgers.edu.

References

Arnett, J. J. (1999). Adolescent storm and stress, reconsidered. *American Psychologist, 54*, 317–326.

Block, J. (1993). Studying personality the long way. In D. C. Funder & R. D. Parke, et al. (Eds.), *Studying lives through time: Personality and development. APA science volumes* (pp. 9–41). Washington, DC, USA: American Psychological Association.

Block, J. (2001). Millennial contrarianism: the five-factor approach to personality description 5 years later. *Journal of Research in Personality, 35*(1), 98–107.

Block, J., & Robins, R. W. (1993). A longitudinal study of consistency and change in self-esteem from early adolescence to early adulthood. *Child Development, 64*, 909–923.

Caspi, A., Moffitt, T. E., Newman, D. L., & Silva, P. A. (1998). Behavioral observations at age 3 years predict adult psychiatric disorders: longitudinal evidence from a birth cohort. In M. E. Hertzig, E. A. Farber, & A. Ellen (Eds.), *Annual progress in child psychiatry and child development: 1997* (pp. 319–331). Philadelphia, PA, US: Brunner/Mazel, Inc.

Chassin, L., & DeLucia, C. (1996). Drinking during adolescence. *Alcohol Health & Research World, 20*(3), 175–180.

Cob, N. J. (1998). *Adolescence: Continuity, change, and diversity*. Mountain View, CA: Mayfield Publishing Co.

Cooper, L. M., Wood, P. K., Orcutt, H. K., & Albino, A. (2003). Personality and predisposition to engage in risky or problem behaviors during adolescence. *Journal of Personality and Social Psychology, 84*(2), 390–420.

Eaton, L. G., & Funder, D. C. (2000). California Q-sort and riverside behavioral Q-sort prototypes of the five-factors of personality. Unpublished manuscript.

Friedman, H. S., Tucker, J. S., Schwartz, J. E., Tomlinson-Keasey, C., Martin, L. R., Wingard, D. L., et al. (1995). Psychological and behavioral predictors of longevity: the aging and death of the "Termites". *American Psychologist, 50*, 001–010.

Funder, D. C. (1999). *Personality judgment: A realistic approach to person perception*. San Diego, CA: Academic Press.

Funder, D. C., Furr, R. M., & Colvin, C. R. (2000). The riverside behavioral Q-sort: a tool for the description of social behavior. *Journal of Personality, 68*(3), 451–489.

Funder, D. C., & Sneed, C. D. (1993). Behavioral manifestations of personality: an ecological approach to judgmental accuracy. *Journal of Personality and Social Psychology, 64*(3), 479–490.

Gullone, E., & Moore, S. (2000). Adolescent risk-taking and the five-factor model of personality. *Journal of Adolescence, 23*(4), 393–407.

Jessor, R. (1998). *New perspectives on adolescent risk behaviors*. New York: Cambridge University Press.

John, O. P., Caspi, A., Robins, R. W., Moffitt, T. E., & Stouthamer-Loeber, M. (1994). The "Little Five": exploring the nomological network of the Five-Factor model of personality in adolescent boys. *Child Development, 65*, 160–178.

Markey, C. N. (2002). A longitudinal examination of personality and pubertal development as predictors of preadolescent girls' psychological and behavioral health. Unpublished doctoral dissertation. University of California, Riverside.

Markey, C. N., Ericksen, A. J., Markey, P. M., & Tinsley, B. J. (2001). Personality and family determinants of preadolescents' participation in health-compromising and health-promoting behaviors. *Adolescent and Family Health, 2*(2), 83–90.

Markey, P. M., & Markey, C. N. (2006). A spherical conceptualization of personality traits. *European Journal of Personality, 20*, 169–193.

Markey, C. N., Markey, P. M., & Tinsley, B. J. (2003). Personality, puberty, and preadolescent girls' risky behaviors: examining the predictive value of the five-factor model of personality. *Journal of Research in Personality, 37*, 405–419.

Markey, P. M., Markey, C. N., & Tinsley, B. J. (2004). Children's behavioral manifestations of the Five-Factor Model of personality. *Personality and Social Psychology Bulletin, 30*, 423–432.

Markey, P. M., Markey, C. N., & Tinsley, B. J. (2005). Applying the interpersonal circumplex to children's behavior: parent–child interactions and risk behaviors. *Personality and Social Psychology Bulletin, 31*, 549–559.

Markey, P. M., Markey, C. N., Tinsley, B. J., & Ericksen, A. J. (2002). A preliminary validation of preadolescents' self-reports using the Five-Factor Model of personality. *Journal of Research in Personality, 36*, 173–181.

Millenstein, S. G., & Litt, I. F. (1993). Adolescent health. In S. Feldman & G. Elliot (Eds.), *At the threshold: The developing adolescent* (pp. 431–456). Cambridge: Harvard University Press.

Newman, D. L., Caspi, A., Moffitt, T. E., & Silva, P. A. (1997). Antecedents of adult interpersonal functioning: effects of individual differences in age 3 temperament. *Developmental Psychology, 33*(2), 206–217.

Rosenthal, R., Rosnow, R. L., & Rubin, D. B. (2000). *Contrast and effect sizes in behavioral research*. New York: Cambridge University Press.

Shelder, J., & Block, J. (1990). Adolescent drug use and psychological health: a longitudinal inquiry. *American Psychologist, 45*, 612–630.

Shiner, R. L., Masten, A. S., & Roberts, J. M. (2003). Childhood personality foreshadows adult personality and life outcomes two decades later. *Journal of Personality, 71*, 1145–1170.

US Department of Health and Human Services (2000a). *Healthy people 2010 (Conference edition, in two volumes)*. Washington, DC: United States Government Printing Office.

US Department of Health and Human Services (2000b). *Healthy people 2010: Understanding and improving health* (2nd ed.). Washington, DC: United States Government Printing Office.

Westen, D., & Rosenthal, R. (2003). Quantifying construct validity: two simple measures. *Journal of Personality and Social Psychology, 84*(3), 608–618.