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Personality in Preschool Children:

Preliminary Psychometrics of the M5-PS Questionnaire

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ABSTRACT

Childhood individual differences have historically been conceptualized with temperament models. More recently, theories of personality, applicable to adults and older children, have been extended downward to the preschool age group. The Five-Factor Model of personality (FFM) in particular has been successfully applied in samples of very young children (e.g., Abe & Izard, 1999; Mervielde, Buyst, & De Fruyt, 1995). The present study is part of an ongoing project aimed at developing a reliable and valid objective questionnaire for assessment of the FFM in preschool children. Pre-school aged children (ages 2-6) were assessed using the M5-PS, a preschool personality measure currently under development, and the Childhood Behavior Questionnaire-Very Short Form (CBQ-VSF). The 90- item M5-PS comprises 5 scales that correspond to the five personality domains of the FFM. Each of the 18-item scales was refined through the use of item removal in order to obtain maximum internal consistency. Scale refinement resulted in a 72-item measure with much improved internal consistency. However, before and after correlations with the CBQ-VSF did not show consistent improvement, suggesting the need for continued development of the M5-PS.

INTRODUCTION

In recent years, individual differences in children have, to an increasing degree, been reconceptualized in terms of personality. Personality is usually described as the consistent patterns of thoughts, feelings, and behaviors that people exhibit, including acquired characteristics such as morals, values, beliefs, and social cognitions (Rothbart & Bates, 2006). This reconceptualization, not coincidentally, parallels the emergence of the Five Factor Model of personality (FFM). Over the past 20-25 years the FFM has become the prevailing paradigm in the field of personality psychology and has clearly become the dominant approach for studying individual differences among adults (Costa & McCrae, 1995; Slotboom, Havill, Pavlopoulos, & Dr Fruyt, 1998; Swann & Seyle, 2005).

The FFM contains five broad domains of personality: Neuroticism (N), Extraversion (E), Openness to Experience (O), Conscientiousness (C), and Agreeableness (A). Each of these domains contains six lower-level areas, known as facets, which describe the domain at a more detailed level.

Neuroticism explores how one presents emotions and reacts in stressful situations. Emotions may be adjusted to lend themselves to specific situations, or may present as unstable and psychologically distressful. Interpersonal relationships are explored through the Extraversion factor. The quality and intensity of relationships with others and one's desire to engage with one's surroundings are investigated. Conscientiousness assesses goal-directed behavior and one's desire to achieve and persist in challenging situations. Organization and impulsivity, as well as motivation and dependability are considered in this domain. Interpersonal orientation is the focus of the Agreeableness factor. Levels of compassion in thoughts, feelings, and actions are presented along a continuum. Of the five broad domains, Openness to Experience may be the

least tangible and most abstract factor. Openness to Experiences aims to assess one's desire to seek out the unfamiliar ("I have a vivid imagination").

One of the first studies to use the FFM to explore personality traits in children was conducted by Digman and Inouye (1986). In this study, children ages 11-12 were rated on 43 characteristics; five factors paralleling the FFM emerged from these characteristics. Mervielde et al. (1995) found the FFM to be present in children as young as 4 years of age, and Abe and Izard (1999) have found substantial validity for the FFM being present in younger children as well. Therefore, the debate lies not in whether there are tangible characteristics to measure, but whether these characteristics are stable over time. There is disagreement among researchers regarding the stability of personality characteristics across the lifespan, in particular during childhood and adolescence; empirical data support both sides of this dichotomy (Abe, 2005; McCrae & Costa, 1990). The importance of this issue lies in the ability to use childhood personality as a predictor of adult personality. Costa and McCrae (1994) found personality to stabilize around the age of 30 and suggested that it remains invariant throughout adulthood. Researchers speculate that prior to the age of 30, maturation and developmental changes contribute to changes in personality, thus suggesting that personality characteristics are unstable during early childhood years, and even into adolescence (Costa & McRae, 1994; Hampson & Goldberg, 2006; Lewis 2001; McCrae et al., 1999). Some longitudinal studies have found personality traits to present only weak correlations over time (Lewis, 2001). For example, Agreeableness and Conscientiousness have been found to increase with age, while younger adults and adolescents often show higher Neuroticism, Openness to Experience, and Extraversion (McCrae et al., 1999). Hampson and Goldberg (2006) found both childhood personality and adulthood personality to remain stable, but as two separate entities; this stability

does not extend across these two separate intervals. Also, while there was some stability presented within childhood characteristics, the stability found in adulthood personality is much more convincing.

In contrast, Abe (2005) found there to be "striking continuities in personality from early childhood to adolescence" (p. 423). Children as young as age 3½ were found to have consistency among personality characteristics measured using the FFM into their adolescent years. Thus, some research suggests that not only is it apparent that children present measurable personality characteristics at the age of 3, but also that these characteristics are predictive of later personality traits. Another longitudinal study by Caspi, Harrington, Milne, Amell, Theodore, and Moffitt (2003) yielded noticeable similarities in characteristics of participants studied at age 3 and again at ages 18 and 26. This link suggests that behavior in childhood is a strong precursor to personality in adulthood and may present a "foundation of the human personality in the early years of life" (Caspi et al., 2003, p. 496). Halverson, Kohnstamm, and Martin (1994) stated that the FFM is "robust across different groups of subjects, item pools, instruments, and methods of analysis, as well as across different languages and cultures" (p. 2). Overall, these studies present the ability to use the FFM in childhood as valid predictor of personality through adolescence and adulthood.

There is an emerging body of research that compares temperament and personality models when considering childhood differences (e.g., De Pauw, Mervielde, & Van Leeuwen, 2009; Grist & McCord, 2010). Some believe that this distinction may be more historical and theoretical, and less based on any empirical reasoning. Despite this theoretical gap, some studies have attempted to bridge the gap between two potentially related fields. Lanthier and Bates (1995, cited in Hagekull & Bohlin, 2003) have successfully linked temperament and personality

traits from infancy through late teens, suggesting temperament may be useful in the validation of exploring personality traits in children and young adults. However, this is an area of research that requires more exploration. Strelau (1987) believes in the importance of not dividing personality and temperament into two separate, mutually exclusive areas of study. Rather, integrating these two perspectives may ultimately help rather than hinder in the evolution of studying individual differences in children; seeing them as complementary paradigms will expand our knowledge in this area.

As noted above, there is a growing body of research on individual differences in young children, using newer personality models in comparison to and instead of traditional temperament models. Whereas researchers studying adult personality have the advantage of many objective and psychometrically sound measurement tools such as the NEO-PI-R (Costa & McCrae, 1992) and the Big Five Inventory (John & Srivastava, 1990), few if any such instruments are available to those studying personality in young children (Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003; Havill, Allen, Halverson, & Kohnstamm, 1994; Slotboom et al., 1998). Having a measure to aid in the exploration of the FFM in children would “open an avenue where we might link child and adult literatures” and would hold “considerable promise for understanding personality in the life-span context” (Havill et al., 1994, p. 385). One notable exception is the Inventory of Children’s Individual Differences (ICID; Halverson et al., 2003). The ICID has helped facilitate exploration in childhood personality differences, yet this measure is still in development. Barbaranelli et al. (2003, 2007) also explored personality development, but focused on late childhood and early adolescence. While the BFQ-C does help to bridge the gap between adulthood and late childhood, it does not address the lack of assessment instruments for the preschool age range.

Though a few measures of childhood individual differences exist, there is still a need for more empirically based instruments in this area in order to adequately assess the representation of the FFM in young children (Caspi & Shiner, 2006). Having a variety of instruments measuring individual differences in children available is better for research purposes and thus creates opportunities for expanding knowledge in this area. Also, the development of another measure focusing on childhood individual differences will aid in determining external validity of these measures.

To this end, Grist and McCord (2006) have developed an objective preschool questionnaire based on the FFM with items derived from Goldberg's (1999) International Personality Item Pool (IPIP). Briefly, this set of more than 2,000 items allows researchers to construct non-copyrighted, freely-available "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., "Feel others' emotions," "Keep my promises"). Although the reading level is generally modest, the item content is clearly geared toward adult populations. The goal of developing the M5-PS was 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 three different proxies of Costa and McCrae's (1992) 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, there was a desire to select the most relevant items, but to include about the same number of items for each of the five trait scales. (The original factor association for each item from the IPIP was tentatively retained.) This approach yielded the current 90-item set, with 18 items for each personality factor. Table 1 includes all 90 items in questionnaire order. Scores are obtained for Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Open 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.

Table 1. M5-PS Items.

Item #	Coding Direction	Text	Factor
1	+	Worries about things	N
2	+	Has a vivid imagination	O
3	-	Distrusts people	A
4	+	Completes tasks successfully	C
5	+	Gets angry easily	N
6	+	Takes charge	E

Item #	Coding Direction	Text	Factor
7	-	Seldom gets emotional	O
8	-	Breaks rules	C
9	+	Is easily intimidated	N
10	+	Makes friends easily	E
11	+	Trusts others	A
12	+	Gets irritated easily	N
13	+	Likes music	O
14	+	Experiences emotions intensely	O
15	+	Tries to follow the rules	C
16	+	Is always busy	E
17	-	Prefers to stick with things that he/she knows	O
18	+	Is easy to satisfy	A
19	+	Likes to solve complex problems	O
20	+	Radiates joy	E
21	-	Jumps into things without thinking	C
22	+	Tries to excel at what they do	C
23	-	Is indifferent to the feelings of others	A
24	-	Is comfortable in unfamiliar situations	N
25	+	Is always on the go	E
26	-	Dislikes changes	O
27	+	Can't stand confrontations	A
28	+	Has a lot of fun	E
29	+	Is afraid of many things	N
30	+	Loves to daydream	O
31	-	Is wary of others	A
32	+	Sticks to the rules	A
33	-	Feels comfortable with him/herself	N
34	+	Tries to lead others	E
35	-	Is not easily affected by his/her emotions	O
36	-	Likes to take his/her time	E
37	+	Works hard	C
38	+	Seeks adventure	E
39	+	Becomes overwhelmed by events	N
40	-	Is relaxed most of the time	N
41	-	Does not understand things	C
42	+	Gets upset easily	N
43	-	Does not like crowded events	E
44	-	Knows how to get around the rules	A
45	+	Wants everything to be "just right"	C

Item #	Coding Direction	Text	Factor
46	-	Does not like the idea of change	O
47	+	Loves action	E
48	+	Feels comfortable around other people	E
49	+	Trusts what people say	A
50	+	Loves order and regularity	C
51	+	Loves to help others	A
52	-	Is a creature of habit	O
53	-	Yells at people	A
54	+	Plunges into tasks with all their heart	C
55	+	Has a rich vocabulary	O
56	-	Knows the answers to many questions	A
57	-	Knows how to cope	N
58	+	Gets stressed out easily	N
59	+	Acts comfortably with others	E
60	+	Enjoys being part of a group	E
61	-	Leaves his/her belongings around	C
62	+	Tries to influence others	E
63	+	Is concerned about others	A
64	+	Tells the truth	C
65	+	Is interested in many things	O
66	+	Involve others in what he/she is doing	E
67	+	Has frequent mood swings	N
68	-	Experiences very few emotional highs and lows	O
69	-	Does the opposite of what is asked	C
70	-	Insults people	A
71	-	Has difficulty starting tasks	C
72	+	Loses his/her temper	N
73	+	Likes to begin new things	O
74	-	Gets back at others	A
75	+	Gets overwhelmed by emotions	N
76	+	Laughs aloud	E
77	+	Suffers from others' sorrows	A
78	-	Acts without thinking	C
79	-	Adapts easily to new situations	N
80	-	Doesn't see the consequences of things	C
81	-	Is able to stand up for his/herself	N
82	-	Makes him/herself the center of attention	A
83	+	Amuses his/her friends	E
84	+	Sympathizes with others' feelings	O

Item #	Coding Direction	Text	Factor
85	+	Is easily frustrated	N
86	+	Respects others	O
87	-	Messes things up	A
88	-	Is demanding	O
89	+	Starts conversations	C
90	+	Finishes what he/she starts	C

Note. Coding direction "+" means that the responses are coded in a positive direction, whereas an "-" means that they are reverse-coded.

The purpose of the current project was to provide preliminary psychometrics and further scale development for the M5-PS Questionnaire. The five scales assessed (Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) were refined through item removal to provide the most accurate assessment of each trait possible and increase internal validity. Furthermore, by correlating the M5-PS with a widely used temperament scale, the Childhood Behavior Questionnaire-Very Short Form (CBQ-VSF; Putnam & Rothbart, 2006) before and after M5-PS scale refinement, any improvement in external validity could be assessed.

METHOD

Participants

Eighteen student volunteers in an undergraduate birth-to-kindergarten education course at a mid-sized southern university served as participants for the current study. Each student was enrolled in a student-teaching practicum, in which he or she observed and interacted with children in preschool and/or pre-kindergarten classrooms and daycares across the region. Students were offered extra credit for evaluating these children. Due to the observational nature of this study, the Institutional Review Board (IRB) policy states that there was no need to obtain consent from parents of the children.

One hundred twenty-two children were selected, based on age requirements, by student volunteers. The average age of children observed was 51 months, (4 years, 3 months) and ranged from 35 months (2 years, 11 months) to 72 months (6 years) old, with a standard deviation of 7.14 months. Of the 122 children, 61 were male and 61 were female. Ethnicity varied, with 74% Caucasian children, 13% Hispanic, and the remaining 13% of children identified as Asian, African American, Native American, or Other.

Measures

The following measures were completed by the participants, based on their observers of the children in their student-teaching classrooms.

M5-PS Questionnaire. The M5-PS Questionnaire (Grist & McCord, 2006) is an adaptation of the original M5 Questionnaire (McCord, 2002), which assesses personality traits in adults. The M5-PS is a preschool version of the M5 designed to explore personality traits in preschool-aged children (3-6 years old). The M5-PS contains 90 items and is designed to be completed by a parent, teacher, or other individual who has a close relationship with the child. Each item is worded in the third person (i.e., “Has a rich vocabulary”) and is scored using a 5-point Likert-type scale ranging from 1 (Very Inaccurate) to 5 (Very Accurate), reflecting the informant’s impressions of the child he or she is assessing. The M5-PS takes approximately 10 minutes to complete.

Children’s Behavior Questionnaire-Very Short Form. The Children’s Behavior Questionnaire (CBQ)-Very Short Form (Putnam & Rothbart, 2006) is a measure of temperament for children 3 to 7 years old. It was designed as an abbreviated version of the original Children’s Behavior Questionnaire (Rothbart, Ahadi, Hershey, & Fisher, 2001). Through factor analysis of items, the CBQ-VSF reveals three dimensions of childhood temperament: Surgency, Negative

Affect, and Effortful Control (Putnam & Rothbart, 2006). Negative Affect is characterized by high levels of sadness, fear, discomfort, frustration, and low levels of soothability. High levels of impulsivity, activity level, and pleasure-seeking behavior coupled with low levels of shyness represent the Surgency dimension. Finally, Effortful Control is presented through high attention control and inhibitory control along with low perceptual sensitivity. The Very Short Form CBQ contains 36 items and is intended to be a parent or teacher-rating instrument. The rater will respond to each item using a 7-point Likert-type scale, with choices ranging from 1 (extremely untrue of your child) to 7 (extremely true of your child). All items are presented in the third person and in statement form (i.e. “Likes being sung to”, “Prefers quiet activities to active games”, and “Is good at following instructions”). The Very Short Form CBQ presents high internal consistency for each dimension across samples, ranging from .62 to .78, satisfactory criterion validity, stability over time, and agreement across informants (maternal ratings vs. paternal ratings) (Putnam & Rothbart, 2006).

RESULTS

The scale reliability procedure in SPSS 16.0 was used to analyze each of the 5 initial 18-item domain scales to achieve optimal internal consistency. Items were considered for removal based on two criteria: item correlation with scale total and effect on Cronbach’s alpha of the complete scale if item were removed. Some trial and error in item removal was utilized in order to achieve an overall maximum Cronbach’s alpha, while still maintaining adequate scale lengths. Criteria set for deciphering adequate Cronbach’s alpha values and scale lengths were as follows: Cronbach’s alpha of .9 or higher for use in a clinical setting, .8 for non-clinical, real life settings, and .7 for use as a research instrument, and a goal of no fewer than 10 items per scale. See Table 2 for original and revised Cronbach’s alpha value comparisons.

Table 2: Cronbach's alpha before and after item removal

Scale	**Cronbach's alpha: Before item removal**	**Cronbach's alpha: After item removal**
Conscientiousness	.882	.888
Extraversion	.805	.827
Agreeableness	.708	.804
Neuroticism	.854	.865
Openness to Experience	.312	.551/.772*

All Cronbach's alpha values based on full sample of 122 participants.
* With 10 items/8 items.

A 16-item Conscientiousness scale remained after the removal of items 45 and 86 (items are listed in Table 1). Cronbach's alpha improved from .882 to .888. The removal of one item, number 36, resulted in improvement in Cronbach's alpha from .805 to .827 for the Extraversion scale. Further item removal was not particularly helpful. This scale remained at seventeen items. For the Agreeableness scale, the removal of 5 items resulted in an improved Cronbach's alpha from .708 to .804. Items removed were numbered 3, 27, 31, 56, and 77. This resulted in a 13-item scale. Assessment of the Neuroticism scale suggested the removal of 2 items (9 and 81), resulting in a 16-item scale. This increased Cronbach's alpha from .854 to .865. Openness to Experience presented a more difficult task to obtain a satisfactory Cronbach's alpha. A scale of 10 items after the removal of 8 items (items 7, 14, 26, 30, 35, 46, 68, and 88) presented a noticeable increase of Cronbach's alpha from .312 to .551. The further removal of items 17 and 52, resulting in an 8-item scale, produced a substantially better Cronbach's alpha of .772.

The relationship between temperament scales, measured with the CBQ, and personality domains, assessed using the M5-PS, was investigated through the use of Pearson product-moment correlation coefficients. Initial correlations of these two measures before M5-PS scale refinement are shown in Table 3. Conscientiousness presented a weak yet significant negative correlation with Surgency ($r = -.259$, $p < .01$) and a strong positive relationship with effortful

control (r = .543, p < .01). There was a significant strong positive relationship between Extraversion and surgency (r = .513, p < .01). Agreeableness significantly correlated negatively with surgency (r = -.327, p < .05) and negative affect (r = -.429, p < .01). Neuroticism and negative affect had a strong significant positive relationship (r = .601, p < .01). Finally, Openness to Experience was found to have a very weak positive correlation with effortful control (r = .266, p < .05).

Table 3: CBQ and M5-PS Correlations Before Item Removal

		CBQ-VSF		
M5-PS Original Scales		Surgency	Negative Affect	Effortful Control
	Conscientiousness	-.259**	-.009	.543**
	Extraversion	.513**	-.067	.028
	Agreeableness	-.327**	-.429**	.154
	Neuroticism	-.024	.601**	.051
	Openness to Experience	.032	.058	.266*

*p<.05, **p<.01. All correlations based on full sample of 122 participants.

After M5-PS scale refinement and item removal, each personality trait was once again correlated, using Pearson product-moment correlation coefficients, with the three temperament scales of the CBQ (see Table 4). Conscientiousness had a weak yet significant negative correlation with Surgency (r = -.229, p < .05) and a significant positive correlation with Effortful Control (r = -.339, p < .01). Extraversion had a significant strong positive relationship with Surgency (r = .528, p > .01) and a weaker, yet still significant positive relationship with Effortful Control (r = .253, p < .01). Agreeableness and Effortful Control had a significant positive correlation (r = .284, p > .01), while Neuroticism presented a weak, yet significant positive relationship with Negative Affect (r = .214, p < .05). Openness to Experience had significant positive correlations with both Negative Affect (r = .207, p < .05) and Effortful Control (r = .355, p < .01).

Table 4: CBQ and M5-PS Correlations After Item Removal

		CBQ-VSF		
		Surgency	Negative Affect	Effortful Control
M5-PS Refined Scales	Conscientiousness	-.229*	.032	.339**
	Extraversion	.528**	.171	.253**
	Agreeableness	-.167	-.069	.284**
	Neuroticism	-.156	.214*	-.140
	Openness to Experience	.060	.207*	.355**

*p<.05, **p<.01. All correlations based on full sample of 122 participants.

Discussion

After item removal at the domain level, the M5-PS presented higher internal validity for each of the five personality traits: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. While Conscientiousness presented an initially strong internal validity using the full 18 items, the removal of 2 items increased the validity slightly. The internal validity of Extraversion also increased after the removal of 1 item, as did the Neuroticism scale after the removal of 2 items. Agreeableness improved considerably after removing 5 items. Each of these four domain scales exhibits internal validity adequate to be used in non-clinical and research settings. The refinement of these scales was successful, yet there remains room for improvement in order to bring these scales to the level necessary for clinical use. Standing alone, these four scales present a promising depiction of the success of the M5-PS as a tool for measuring childhood personality, yet require further review.

The refinement of the Openness to Experience scale required the removal of several items, as the initial internal validity of the full 18-item scale was extremely low. After the removal of 8 items, this scale showed a substantial increase in internal validity, but not enough for confident use in either applied or research settings. However, the removal of 10 items improved the internal validity to a level at which this scale would be considered valid as a research instrument. This finding is consistent with the common assertion that Openness to

Experience is the weakest, most abstract, and most intangible of the five personality domains. After item removal, 72 items remain on the M5-PS Questionnaire (accepting the 10-item Openness scale).

Exploration of external validity of the M5-PS as compared to temperament scales on the CBQ-VSF produced less compelling results. The full 90-item M5-PS found strong correlations between temperament factors and personality domains. Extraversion and Surgency had a strong positive relationship, Conscientiousness and Effortful Control had a strong positive relationship, and Neuroticism and Negative Affect had a strong positive relationship. After item removal, there was notable fluctuation in both the level of significance and the direction of correlation for many temperament scale and personality domain relationships.

From this, we must conclude that the external validity of the M5-PS with the CBQ-VSF did not improve after scale refinement. Through this fluctuation of relationships, it is evident that further exploration and scale refinement is necessary. Additional scale refinement of the five domain scales needs to be conducted to improve internal reliability as well as to improve external validity.

The relatively small sample size used in this study, as well as the localized geographical selection of children assessed, may limit the ability to generalize the results of this study. Also, this small sample size may hinder the ability to refine scales at a deep enough level necessary to obtain optimal internal consistency. Other limitations to take into account include the relationship between the student volunteers completing the M5-PS and the children they were observing. Their relationship was restricted to a pre-kindergarten/ daycare setting, which is much more structured than a home setting; this context places children in a social setting with other children, and it may have a different level of discipline than would be found at home. The

potential formality, social demands, and teacher-student relationship may have influenced the rating of items on the M5-PS.

With this said, research is underway that will expand on the current study and address these items Increasing the sample size, as well as offering more diversity in culture, language, geographical setting, and socioeconomic status may bring forth results presenting more definitive conclusions. Comparing parent and teacher administration of the M5-PS may address any rater bias or inconsistency that may have been present in the current study.

One area of future research that is necessary in order to improve psychometrics of the M5-PS is a comparison with other temperament and childhood personality assessments. As one of the many goals of this study was to aid in producing a scale as sound and reliable as those currently dominating the field of temperament, demonstrating external validity with these scales bolsters the usefulness of the M5-PS. Along with the need for evidence of external validity of the M5-PS, further psychometrics need to be explored, such as test-retest reliability and inter-rater reliability. Also, longitudinal studies involving the M5-PS may offer a look into the development and stability of personality traits throughout early childhood as well as later stages of life. The M5-PS is certainly in need of refinement; however, the present study serves as the start of this refinement process.

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