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Authors

Zalta, Alyson K
Allred, Kelly M
Jayawickreme, Eranda
et al.

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Validation of the Parental Facilitation of Mastery Scale – II

Alyson K. Zalta[1,2], **Kelly M. Allred**[3], **Eranda Jayawickreme**[4], **Laura E. R. Blackie**[4], and **Dianne L. Chambless**[3]

[1]Department of Behavioral Sciences, Rush University Medical Center, Chicago, IL

[2]Department of Psychiatry, Rush University Medical Center, Chicago, IL

[3]Department of Psychology, University of Pennsylvania, Philadelphia, PA

[4]Department of Psychology, Wake Forest University, Winston-Salem, NC

Abstract

Objective—To develop a more reliable and comprehensive version of the Parental Facilitation of Mastery Scale (PFMS).

Method—In Study 1, 387 undergraduates completed an expanded PFMS (PFMS-II) and measures of parenting, perceived control, responses to early life challenges, and psychopathology. In Study 2, 182 trauma-exposed community participants completed the PFMS-II and measures of perceived control, psychopathology, and well-being.

Results—In Study 1, exploratory factor analysis of the PFMS-II revealed two factors. These factors replicated in Study 2; one item was removed to achieve measurement invariance across race. The final PFMS-II consisted of a ten-item overprotection scale and a seven-item challenge scale. In both samples, this measure demonstrated good convergent and discriminant validity and was more reliable than the original PFMS. Parental challenge was a unique predictor of perceived control in both samples.

Conclusions—The PFMS-II is a valid measure of important parenting behaviors not fully captured in other measures.

Keywords

Parenting; Overprotection; Challenge; Mastery; Self-efficacy

Perceived control, or the psychological sense that one is able to personally influence events and outcomes in one's life, has been identified as an important buffer against the development of anxiety disorders (Batelaan et al., 2010; Chorpita & Barlow, 1998; de Beurs et al., 2005; Roberts, Roberts, & Chan, 2009). Theories describing the processes by which individuals develop perceived control emphasize the role of the early learning environment (Carton & Nowicki, 1994; Rotter, 1966). Specifically, these theories highlight the need for

children to experience and overcome challenges early in life in order to develop a sense of perceived control and resilience to stress later in life. Using a national longitudinal sample, Seery and colleagues (2010) revealed a quadratic relationship between cumulative lifetime adversity and mental health such that individuals with some lifetime adversity demonstrated better mental health and well-being compared to those with no adversity and high levels of adversity. Thus, having exposure to manageable stressors or challenges early in life is likely to enhance a sense of perceived control, which in turn buffers against the development of anxiety and promotes future well-being.

For children, parents play a particularly important role in shaping opportunities for mastery building in the early learning environment. In particular, parenting styles characterized by overprotection and control are thought to limit children's opportunities to act autonomously and develop a sense of mastery (Chorpita & Barlow, 1998). Research has shown that overprotective parenting is associated with a diminished sense of perceived control and higher levels of anxiety pathology in children (see Ballash, Leyfer, Buckley, & Woodruff-Borden, 2006 for a review). The majority of these studies have relied on the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) to assess overprotective parenting styles. There are two limitations to the PBI with respect to how it captures parenting styles that may promote mastery in children. First, the PBI fails to capture the ways in which parents actively promote a sense of perceived control in their children, which is different from a lack of overcontrolling behaviors or permissiveness. Second, in assessing overprotective parenting, the PBI requires respondents to make attributions about their parents' mental states on items such as "Liked me to make my own decisions" and "Did not want me to grow up." This type of question may introduce retrospective reporting biases.

Zalta and Chambless (2011) developed the Parental Facilitation of Mastery Scale (PFMS) to (a) assess the ways in which parents actively foster mastery in children and (b) assess overcontrolling parenting behaviors using items that assess parenting behaviors rather than parents' intentions. Psychometric analyses of this scale revealed two factors, including one factor characterized by overprotective behaviors and another factor characterized by challenging behaviors (i.e., challenging children to engage and persist in difficult tasks). These two factors were only modestly correlated ($r = .37$) and were independently predictive of measures of perceived control, suggesting two largely independent constructs. Moreover, the PFMS demonstrated good convergent validity with measures of parenting and sibling reports and good discriminant validity with measures of anxiety, indicating good construct validity. To date, no other parenting measures assess the ways in which parents actively foster a sense of mastery by encouraging children to take on challenging experiences. Results of this initial PFMS study further demonstrated that perceived control mediated the relationship between parenting behaviors and anxiety, consistent with developmental theories of anxiety (Chorpita & Barlow, 1998).

Although the PFMS is a valuable measure in that it assesses both overprotective and challenging parenting behaviors, the current version of the scale has some limitations. Namely, the internal consistency of the measure, particularly the challenge scale, was lower than desirable when measured in a new sample of 114 undergraduates not included in the original validation study, $\alpha < .70$ (Zalta, 2011). The modest reliability of the scale is likely

due to the fact that the scale is comprised of very few items (five overprotection items and four challenge items); a longer version of the scale should improve reliability. Adding items would also increase content validity by ensuring that the measure more comprehensively captures the parenting behaviors that foster a sense of mastery in children.

Study 1

The primary goal of Study 1 was to test the reliability and validity of an expanded version of the PFMS referred to as the Parental Facilitation of Mastery Scale – II (PFMS-II). Specifically, we sought to develop a more reliable and comprehensive version of the original PFMS by increasing the number of items and more fully mapping the domains of interest, particularly where the brief challenge scale was concerned.

Method

Participants—Participants were recruited through the psychology department study pool and had to be 18 to 29 years of age and fluent in English to be eligible for the study. The sample included 387 undergraduates (255 women, 132 men) ranging in age from 18 to 27 years ($M = 19.5$, $SD = 1.4$). The racial composition of the sample was 59.2% European American, 22.0% Asian, 7.0% Hispanic or Latino, 6.5% African American, and 5.2% other or unknown. Participants came from all college classes but were mostly younger students including 43.4% Freshmen, 28.9% Sophomores, 16.3% Juniors, and 11.4% Seniors. Socioeconomic status was relatively high: 80.6% had fathers with a minimum of a Bachelor's degree (e.g., Bachelor's, Master's, Doctorate, or professional degree) and 77.3% had mothers with a minimum of a Bachelor's degree.

Procedures—After completing informed consent, participants completed a set of online questionnaires hosted by SurveyMonkey.com. The survey took approximately one hour to complete. Students who completed the questionnaires received credit towards fulfillment of course research requirements. This study was approved by the Institutional Review Board of the University of Pennsylvania.

Measures—We collected measures of parenting behaviors, perceived control (generalized self-efficacy and self-mastery), and psychopathology that were used in previous research examining the original PFMS (Zalta & Chambless, 2011).

Parental Facilitation of Mastery Scale – II (PFMS-II): The original Parental Facilitation of Mastery Scale (PFMS) is a nine-item measure that assesses two types of parenting styles: parental overprotection and parental challenge (Zalta & Chambless, 2011). Parental overprotection is characterized by strict parental supervision, restrictiveness, and hindrance of independence. Parental challenge is characterized by encouragement to seek new experiences and explore independently. In the 2011 study, parenting styles characterized by low levels of overprotection and high levels of challenge were significantly associated with higher levels of perceived control in students. Parenting styles had small direct associations with measures of psychopathology, but a significant indirect association via perceived control. In the current sample, Cronbach's alpha for the original five-item overprotection scale was .70, whereas Cronbach's alpha for the original four-item challenge scale was .62.

The expanded version of this measure was developed through a series of steps. First, the original authors (AKZ & DLC) developed additional items with the original scale intent and previous research findings in mind. Specifically, we developed items that sought to capture both overprotective parenting behaviors and parenting behaviors that help to actively foster mastery in children by encouraging them to pursue challenges. We also aimed to develop behaviorally descriptive items to reduce the likelihood that subject responses would be affected by retrospective reporting biases. These items were then revised based on feedback from colleagues well-versed in anxiety disorders at the University of Pennsylvania. The revised list of items was then sent to a group of experts in the field of childhood anxiety based on the developmental theory that parenting behaviors are connected to child anxiety via perceived control (Chorpita & Barlow, 1998). Childhood anxiety experts have a great deal of experience understanding and intervening on the types of parenting behaviors that affect the development of anxiety pathology in children. Nine experts responded and provided feedback on the item content. Based on these expert opinions, the items were again revised by the original authors, resulting in 25 new items. These 25 items were added to the original 9 items of the PFMS, creating a total of 34 items that were administered in this study. The 34 items were randomized for scale administration. As with the PFMS, participants were asked to indicate the extent to which their parent(s) or primary guardian(s) helped to guide their activities and behaviors during the first 16 years of life using a five-point scale ranging from 1 (*Never*) to 5 (*Always*).

Parental Bonding Instrument (PBI; Parker et al., 1979): The PBI is one of the most widely used and well-validated measures of parenting styles (Parker, 1990; Wilhelm, Niven, Parker, & Hadzi-Pavlovic, 2005). It is a retrospective self-report measure that asks individuals to describe the parenting they received as children. Participants are asked to rate their mothers and fathers separately. The scale assesses two parenting factors: warmth/care and overprotection/control. We focused exclusively on the overprotection/control measure for this study because this measure was used to validate the overprotection scale of the original PFMS (Zalta & Chambless, 2011). This scale asks participants to rate their mother and father on items such as "Tried to make me feel dependent on him/her," "Did not want me to grow up," and "Felt I could not look after myself unless she/he was around." In the current study, Cronbach's alpha was .87 for maternal overprotection/control and .86 for paternal overprotection/control.

Generalized Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995): The GSE is a 10-item scale designed to assess personal agency, that is, beliefs that one will be able to cope with the difficult demands of life and that one's actions are responsible for successful outcomes. Participants respond to items such as "I can solve most problems if I invest the necessary effort" using a four-point scale from 1 (*Not at all true*) to 4 (*Exactly true*). Studies have consistently demonstrated a relationship between higher levels of generalized self-efficacy and better physical and mental health (Luszczynska, Scholz, & Schwarzer, 2005). In the current study, Cronbach's alpha was .87.

Self-Mastery Scale (SMS; Pearlin & Schooler, 1978): The SMS is a widely used measure designed to assess the extent to which people perceive their lives as being under their own

control. The measure has demonstrated the ability to longitudinally predict changes in depression (Pearlin, Menaghan, Lieberman, & Mullen, 1981) and perinatal anxiety (Gurung, Dunkel-Schetter, Colling, Rini, & Hobel, 2005). The SMS contains seven items rated on a four-point scale from 1 (*Strongly disagree)* to 4 (*Strongly agree*). Sample items include "I have little control over the things that happen to me" and "What happens to me in the future mostly depends on me." In the current sample, Cronbach's alpha was .82.

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990): The PSWQ is a 16-item measure commonly used to assess the extent to which individuals engage in chronic worry, the cardinal feature of generalized anxiety disorder. The PSWQ has strong psychometric properties with particularly good sensitivity and specificity in discriminating individuals with generalized anxiety disorder (Brown, Antony, & Barlow, 1992; Fresco, Mennin, Heimberg, & Turk, 2003; Meyer et al., 1990). Respondents are asked to rate themselves on items such as "I've been a worrier all of my life" using a five-point scale from 1 (*Not at all typical*) to 5 (*Very typical*). In the current study, Cronbach's alpha was .93.

Depression-Anxiety-Stress Scales – 21 (DASS-21; Lovibond & Lovibond, 1995): The DASS-21 is a set of three self-report scales designed to assess depression, anxiety (physiological arousal), and stress (chronic tension). Respondents are asked to rate the extent to which they have experienced each state over the past week using a four-point severity/ frequency scale from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much, or most of the time*). Sample items for the depression, anxiety, and stress scales include "I felt down-hearted and blue," "I experienced trembling (e.g., in the hands)," and "I found it difficult to relax," respectively. In the current study, Cronbach's alpha was .89 for the depression scale, .80 for the anxiety scale, and .85 for the stress scale.

Results

Exploratory Factor Analysis—All PFMS-II items were initially examined for skew. For six items, over 80% of the sample endorsed two of the extreme responses (i.e., scored a 1 or 2 on the five-point scale or a 4 or 5 on the five-point scale). These items were eliminated from subsequent analyses given that they could not sufficiently discriminate between participants. Notably, all six items were from the set of new items designed for the PFMS-II and were not part of the original PFMS measure.

To test the factor structure of the remaining 28 items of the PFMS-II, exploratory factor analyses (EFAs) using mean and variance adjusted weighted least squares (WLSMV) estimation and geomin (oblique) rotation were conducted. WLSMV estimation assumes that a normal latent distribution underlies ordered categorical responses such as those created by Likert-type scales and is a preferred approach for item-level factor analysis (Stucky, Gottfredson, & Panter, 2012). We sought a factor solution that attained simple structure, retained at least three items with salient factor loadings above .30, and demonstrated high internal consistency among items with salient factor loadings. All factor analyses were conducted in Mplus (Muthén & Muthén, 2007).

Consistent with Zalta and Chambless (2011), the PFMS-II demonstrated a two-factor structure with an 11-item factor reflecting parental overprotection[1] (PFMS-II-OP) and a seven-item factor reflecting parental challenge (PFMS-II-C; see Table 1 for factor loadings). The remaining 10 items did not have salient loadings on either factor. These factors were modestly correlated ($r = -.32$). Internal consistencies of the overprotection ($\alpha = .83$) and challenge ($\alpha = .73$) factors on the PFMS-II ranged from good to excellent. As desired, the internal consistencies for the PFMS-II were higher than those for the PFMS in this sample (PFMS: $\alpha = .70$ for low protection and $\alpha = .62$ for challenge). All five of the original low protection items from the PFMS loaded onto the PFMS-II overprotection factor. Moreover, one of the PFMS items was the strongest loading item on the PFMS-II overprotection scale, "I was given freedom to make independent decisions." Two of the four original challenge items (PFMS-C) loaded onto the PFMS-II challenge factor (PFMS-II-C) including the strongest loading item on the PFMS-II-C, "I was encouraged to take on a difficult skill." Two of the four items from the PFMS-C no longer loaded on the PFMS-II: "I was encouraged to explore independently" and "I was encouraged to seek new experiences."

Based on these analyses, PFMS-II overprotection and challenge scores were calculated using a sum score of the items that loaded onto each factor. Higher PFMS-II-OP scores reflecting greater parental overprotection and higher PFMS-II-C scores reflecting greater parental challenge. As expected given their shared items, the PFMS and PFMS-II scales revealed a high degree of overlap ($r = .92$ for overprotection and $r = .82$ for challenge; see Table 2).

To test measurement invariance of the PFMS-II factor structure across sex, we ran multigroup confirmatory factor analyses (CFAs) using WLSMV estimation. According to Muthén and Muthén (2007), in tests of measurement invariance with categorical outcomes in Mplus, factor loadings and thresholds must be constrained simultaneously because both parameters affect the item probability curve. Factor loadings and thresholds were first allowed to vary across men and women (Model 1: χ^2 (268) = 652.46, $p < .001$; CFI = .874; RMSEA = .09). Factor loadings and thresholds were then constrained to be equal across sex (Model 2: χ^2 (318) = 710.77, $p < .001$; CFI = .871; RMSEA = .083). To compare nested models we relied upon CFI and RMSEA values instead of the chi square difference test. These fit statistics have been shown to be less sensitive to sample size, model complexity, and violations of the normality assumption than the chi square statistic (Chen, 2007; Cheung & Rensvold, 2002). According to Chen (2007), one should not reject the null hypothesis of invariance if the difference in CFI values across nested models is less than or equal to $-.005$ and the difference in RMSEA across models is less than or equal to .01. The observed changes in CFI and RMSEA from Model 1 to Model 2 provided evidence for strong measurement invariance of the PFMS-II two-factor structure across sex (CFI between Model 2 and Model 1 = $-.003$;   RMSEA between Model 2 and Model 1 = $-.007$).

Missing Data—Of the 387 participants, 315 completed all of the measures whereas 72 were missing data on at least one of the measures. Independent samples *t*-tests were

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[1]In the original study, this factor was scored such that higher scores reflected lower parental overprotection and was referred to as the "low protection" scale. To reduce confusion, we have elected to score this measure in the opposite direction such that higher scores reflect higher parental overprotection. We now refer to this as the "overprotection" scale.

conducted to test for differences between those with and without missing data. Results showed that individuals with missing data had significantly lower scores on the original PFMS challenge factor ($p = .032$) and significantly higher scores on the DASS-21 depression scale ($p = .018$). Thus, the data did not meet criteria for missing completely at random. Multiple imputation using chained equations ($n = 10$ imputations) was used to handle missing data with the mi impute chained command in Stata version 13.1 (StataCorp, 2013).

Convergent and Discriminant Validity—To test the convergent and discriminant validity of the PFMS-II, we examined correlations with measures of overcontrolling parenting (PBI), perceived control (GSE, SMS), and psychopathology (PSWQ, DASS-21). For the overprotection scale (PFMS-II-OP), the PBI, GSE, and SMS were used to establish convergent validity and the PSWQ and DASS-21 were used to establish discriminant validity. For the challenge scale (PFMS-II-C), the GSE and SMS were used to establish convergent validity and the PSWQ and DASS-21 were used to establish discriminant validity. Discriminant validity was tested using Meng, Rosenthal, and Rubin's (1992) procedure for comparing correlated correlation coefficients. This inferential test determines whether two correlated correlation coefficients are significantly different from one another using a Fisher's z transformation. We also used this procedure to compare the degree to which the PBI and PFMS-II-OP were related to measures of psychopathology. The multiple imputation estimated means, standard deviations, and correlations for the PFMS-II with measures of parenting, perceived control, and psychopathology are reported in Table 2.

The PFMS-II overprotection scale (PFMS-II-OP) revealed medium to large correlations with the PBI overprotection scales ($r = .60$–$.73$, $p < .001$), indicating good convergent validity. The PFMS-II-OP was also associated with significantly lower levels of generalized self-efficacy ($r = -.30$, $p < .001$) and self-mastery ($r = -.32$, $p < .001$) with small to moderate correlations. Meng, Rosenthal, and Rubin's (1992) procedure demonstrated that the PFMS-II-OP was significantly more closely related to measures of parenting (PBI; $Z = 7.52$ to 11.96, all $p < .001$) and perceived control (GSE, SMS; $Z = 2.24$ to 4.64, all $p < .05$) than to measures of psychopathology (PSWQ, DASS-21), indicating good discriminant validity.

Comparisons of the PBI overprotection scales and the PFMS-II-OP showed that in some instances the PBI overprotection subscales demonstrated stronger correlations with measures of psychopathology. Specifically, the PBI maternal overprotection scale was more strongly associated with the DASS-21 depression ($Z = 2.10$, $p = .04$) and DASS-21 stress ($Z = 2.62$, $p = .01$) scales than the PMFS-II-OP, and the PBI paternal overprotection scale was more strongly associated with the PSWQ ($Z = 2.06$, $p = .04$) and DASS-21 stress scales ($Z = 3.07$, $p = .002$) than the PFMS-II-OP. Thus, discriminant validity of the PFMS-II-OP vis à vis psychopathology was superior relative to the PBI overprotection scales.

Consistent with previous research, the expanded parental challenge scale (PFMS-II-C) was associated with significantly higher levels of generalized self-efficacy ($r = .40$, $p < .001$) and self-mastery ($r = .35$, $p < .001$) with small to moderate correlations. Meng and colleagues' (1992) procedure demonstrated that the PFMS-II-C was more closely related to measures of

perceived control (GSE, SMS) than to measures of psychopathology (PSWQ, DASS-21; $Z =$ 4.39 to 6.25, all $p < .001$), indicating good convergent and discriminant validity.

Further tests of construct validity—To further explore the independent contributions of the overprotection and challenge constructs, we tested parental overprotection and parental challenge as simultaneous predictors of perceived control as measured by the GSE and SMS. We conducted a multivariate multiple regression using the mi estimate command in which the GSE and SMS were modeled as simultaneous outcomes to reduce the potential for Type I error (Table 3). This model revealed that both lower levels of parental overprotection and higher levels of parental challenge made significant unique contributions to the prediction of higher levels of perceived control in students.

Study 2

This study is part of a larger study examining whether self-reports of personal growth following an adverse life event result in cognitive, behavioral, and personality changes. Blackie and colleagues (2015) reported results from a subsample of this study in which informant reports were obtained for participants.

Method

Participants—The overall sample included 192 individuals recruited from the community of Winston-Salem, NC via advertisements in local papers, apartment complexes, and online websites including Craigslist and a recruitment website managed by a local medical school. To participate, individuals had to be 18 years of age or older and have experienced a *DSM-IV* potentially traumatic event from the Life Events Checklist (Blake et al., 1995) within the past five years. Two individuals in the sample reported less than a 9th grade education level and eight individuals did not report their education level; these participants were removed from the sample due to concerns about reading comprehension and data accuracy. Thus, for the current study, the total sample included 182 individuals (54 men, 127 women) ranging in age from 18 to 78 years ($M = 43.5$, $SD = 14.1$). Using a cutoff score of 14 (Coffey, Gudmundsdottir, Beck, Palyo, & Miller, 2006), 68.5% of the sample ($n = 122$ of 178) reported scores on the Posttraumatic Diagnostic Scale that were indicative of posttraumatic stress disorder (PTSD). Additional characteristics of this sample are reported in Table 4.

Procedures—Those who expressed interest in participating completed a brief prescreening assessment by phone to determine whether they were eligible to participate. Eligible participants were invited to come to come for a group session to complete a packet of questionnaires. During the group session, participants first completed informed consent, then completed a packet of questionnaire that took approximately 90 minutes. Individuals were compensated $30 for their participation. This study was approved by the Human Subjects Committee of Wake Forest University.

Measures—As in Study 1, participants completed the 34-item Parental Facilitation of Mastery Scale – II (PFMS-II) and the Generalized Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995; $\alpha = .81$). Participants also completed the following measures.

Life Orientation Test – Revised (LOT-R; Scheier, Carver, & Bridges., 1994): The LOT-R is a 10-item measure designed to assess dispositional optimism. Items such as "In uncertain times, I usually expect the best" and "I rarely count on good things happening to me" (reverse scored) are rated on a 0 (*Strongly disagree*) to 4 (*Strongly agree*) scale. Of the 10 items, six are scored and four are filler items; the six items are summed to calculate a total score. Research shows that this measure has a high degree of overlap with measures of perceived control (Zalta & Chambless, 2012) and is consistently correlated with measures of psychological well-being (Scheier & Carver, 1992). Cronbach's alpha in the community sample was .80.

Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997): The PDS is a 17-item measure designed to assess PTSD symptom severity. Participants were asked to rate how much they have been bothered by each of the *DSM-IV* PTSD symptoms during the past week on a scale ranging from 0 (*Not at all*) to 3 (*Often*). This includes items such as "Having upsetting thoughts and images about the traumatic event that came into your head when you didn't want them to," "Trying to avoid activities, people, or places that remind you of the traumatic event," and "Being over-alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.)." Due to error on the part of a staff member, this response scale is not entirely consistent with the published version of this measure; however, the anchor points are very similar[2]. Cronbach's alpha in the community sample was .94, suggesting that this version of the measure was reliable.

Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985): The SWLS is a five-item measure that is commonly used to assess the degree to which individuals are satisfied with their life circumstances. Items such as "In most ways my life is close to my ideal" and "So far I have gotten the important things I want in life" are rated on a 1 (*Strongly disagree*) to 7 (*Strongly agree*) scale and summed to create an overall score of global life satisfaction. Cronbach's alpha in the community sample was .88.

Flourishing Scale (FS; Diener, 2009): The FS is an eight-item scale that asks individuals to report on their perceived success in important domains such as relationships, self-esteem, and purpose in life. Items such as "I am engaged and interested in my daily activities" and "My social relationships are supportive and rewarding" are rated on a 1 (*Strongly disagree*) to 7 (*Strongly agree*) scale and summed to create an overall psychological well-being score. Cronbach's alpha in the community sample was .90.

Results

Exploratory Structural Equation Modeling—We first sought to confirm the factor structure evident in data from the undergraduate sample in this older sample of community participants. Research has shown that confirmatory factory analysis may result in poor model fit when individual questionnaire items are used as indicators because CFAs require each indicator to load onto only one factor, which is often too restrictive (Marsh, Morin,

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[2]The response scale for the published measure is as follows: 0 (*Not at all or only one time*), 1 (*Once a week or less/once in a while*), 2 (*2 to 4 times per week/half the time*), 3 (*5 or more times per week/almost always*).

Parker, & Kaur, 2014). Consequently, Marsh et al. (2014) recommend the use of exploratory structural equation modeling (ESEM) which allows for all factor loadings and cross-loadings to be freely estimated within a specified factor structure.

Following the recommendations of Marsh and colleagues (2014), we first conducted a CFA because when a CFA provides adequate fit to the data, it represents the simplest solution. The fit was indeed poor, χ^2 (128) = 394.49, $p < .001$; CFI = .84; RMSEA = .11. We then conducted an ESEM using WLSMV estimation and geomin rotation in Mplus (Muthén & Muthén, 2007) and found acceptable model fit, χ^2 (112) = 230.89, $p < .001$; CFI = .93; RMSEA = .08. Using the same criteria to evaluate factor solutions as in Study 1, we found that the best factor solution of the PFMS-II was a two-factor structure with the same items from the undergraduate sample loading onto the two factors in the community sample (see Table 1).

Multigroup CFAs with WLSMV estimation were then used to test measurement invariance of the PFMS-II factor structure across race for European Americans and African Americans. The change in CFI across nested models exceeded the criterion for invariance proposed by Chen (2007; CFI between constrained and unconstrained model = −.007) because one item ("I was taught that the world is dangerous") loaded much less strongly onto the overprotection factor for African Americans than for European Americans.

Post hoc analyses showed that African American participants reported significantly lower household incomes than European American participants in our sample (χ^2(4) = 12.82, $p = .012$). Given the connection between lower socioeconomic status and the experience of violence (Campbell and Schwarz, 1996; Gladstein, Rusonis, & Heald, 1992), it stands to reason that teaching children that the world is dangerous is not necessarily reflective of overprotective parenting for the African American parents in our sample. Moreover, with hindsight, we realized we should have expected that this item would perform differently for African and European American participants regardless of socioeconomic status. Research shows that African American teenagers are more likely to experience discrimination in stores and by police than non-Hispanic White teenagers (Fisher, Wallace, & Fenton, 2000). Although we know of no published data on this point, we are aware that experience with racial profiling in the United States leads many parents of color to caution their children about the dangers of being stopped by the police, being perceived as shoplifters when they enter a store, and so on (e.g., Murray, 2014).

Consequently, we conducted an ESEM with this item removed. Model fit was acceptable (χ^2 (95) = 174.84, $p < .001$; CFI = .95; RMSEA = .07). We found that the best factor solution for the 17-item PFMS-II continued to be a two-factor structure with factors representing parental overprotection and parental challenge (see factor loadings in parentheses in Table 1). The same items from the undergraduate sample loaded onto the two factors. In the community sample, five PFMS-II items had significant loadings on both factors. Of these items, four ("My activities were strictly supervised," "I was protected from unknown experiences," "I was given freedom to make independent decisions," and "I had little say in most things I did") were ultimately included in the overprotection scale, and one ("I was given household responsibility") was ultimately included in the challenge scale

because they loaded more strongly on these respective factors. The overprotection ($\alpha = .80$) and challenge ($\alpha = .79$) factors demonstrated high internal consistencies and were correlated at $-.18$ in this sample. As in the undergraduate sample, the internal consistencies for the PFMS-II factors were higher than those for the PFMS in this sample ($\alpha = .71$ for overprotection and $\alpha = .74$ for challenge for the original version).

Multigroup CFAs with WLSMV estimation were used to test measurement invariance of the 17-item PFMS-II factor structure across race for European Americans and African Americans. In the first model, factor loadings and thresholds were allowed to vary between African Americans and European Americans (Model 1: $\chi^2 (236) = 453.02$, $p < .001$; CFI = .872; RMSEA = .107). In the second model, factor loadings and thresholds were constrained to be the same across race (Model 2: $\chi^2 (283) = 505.34$, $p < .001$; CFI = .868; RMSEA = .098). These results provide evidence for strong measurement invariance of the 17-item PFMS-II two-factor structure across race (CFI between Model 2 and Model 1 = $-.004$; RMSEA between Model 2 and Model 1 = $-.009$). Thus, the 17-item version of the PFMS-II was retained for all subsequent analyses.

Missing Data—Of the 182 participants, 176 completed all of the measures, whereas six were missing data on at least one of the measures. Independent samples *t*-tests were conducted to test for differences between those with and without missing data. Results revealed no differences between those with and without missing data. Multiple imputation using chained equations was used to handle missing data using the mi impute chained command in Stata version 13.1 (StataCorp, 2013). All correlational analyses were conducted in Stata version 13.1 using mi estimate commands.

Tests of construct validity—The multiple imputation estimated means, standard deviations, and correlations for the PFMS-II with measures of perceived control, optimism, psychopathology, and well-being are reported in Table 5. As expected, the PFMS and PFMS-II demonstrated large correlations indicating a high degree of overlap ($r = .92$ for overprotection and $r = .85$ for challenge; see Table 5). The overprotection scale (PFMS-II-OP) was not significantly correlated with measures of self-efficacy, optimism, life satisfaction, or flourishing ($r = .04$–$.08$, all $p > .28$). By contrast, parental challenge was significantly associated with all of these variables ($r = .18$–$.35$, all $p < .05$). The multiple regression analyses used in Study 1 to examine the unique variance in outcomes accounted for by the challenge and overprotection factors were unnecessary here because the correlations of overprotection with these variables approached zero. Neither factor was significantly associated with psychopathology in the form of posttraumatic stress symptoms ($r = .02$ for overprotection, $r = -.10$ for challenge), consistent with the lack of association between the PFMS-II and PSWQ in Study 1.

Reconsidering Study 1

Results

In light of the findings regarding the item "I was taught that the world is dangerous" in the community sample, we reran the EFA in the undergraduate sample with this item removed (see factor loadings in parentheses in Table 1). Results indicated that the 17-item PFMS-II

still demonstrated a two-factor structure, and this factor structure showed strong measurement invariance across sex. The correlational and regression analyses were also re-run using the 17-item PFMS-II. All results were equivalent to those conducted with the 18-item PFMS-II indicating good internal reliability, convergent, and discriminant validity of the 17-item PFMS-II (results available from Alyson K. Zalta). Thus, the 17-item solution was established as the final PFMS-II measure (see Appendix A).

Discussion

Our findings indicate that the Parental Facilitation of Mastery Scale – II (PFMS-II) is a reliable and valid measure of parenting behaviors that predict self-efficacy and well-being later in life. The expanded version revealed two factors reflecting parental overprotection (10 items) and parental challenge (seven items), consistent with the original measure. This factor solution was stable across two different samples (undergraduates and community members with exposure to trauma), was invariant across sex in the undergraduate sample, and was invariant across race in the community sample. Moreover, the factors demonstrated good internal reliability, which was improved from the original version of the scale, meeting one of the goals of adding items to the measure. Tests of convergent and discriminant validity further supported the construct validity of the expanded measure. The overprotection factor was strongly associated with overprotection scales on the Parental Bonding Instrument, a gold standard measure in the field. Additionally, both PFMS-II scales demonstrated strong discriminant validity with measures of psychopathology with correlations ranging from null to small. Given the high correlation between the PFMS and PFMS-II, findings from the original 2011 study lend further confidence to the current findings, including the support of informant data.

Although parental challenge has historically been overlooked in the literature, our findings suggest that this construct is important in predicting meaningful outcomes for children later in life. In Study 2, parental challenge was associated with generalized self-efficacy, optimism, and measures of well-being whereas parental overprotection was not. These findings are consistent with research showing that exposure to some adversity early in life enhances resilience to stress (e.g., Seery et al., 2010) and suggests that positive parenting is not just a matter of taking a laissez-faire stance or avoiding overprotection, but involves the active promotion of behaviors that are associated with mastery, positive coping, and long-term well-being in children.

It is noteworthy that parental overprotection was associated with generalized self-efficacy in the undergraduate sample (Study 1), but not in the community sample (Study 2). One possible explanation is that overprotective parenting is harmful to self-mastery in contexts where children are unlikely to encounter life-threatening stressors, but has no impact on self-mastery in adverse and threatening environments. Previous studies have demonstrated that the environment is an important moderator of the relationship between parenting styles and child outcomes (Deater-Deckard, Dodge, Bates, & Pettit, 1996). All of the participants in Study 2 had been exposed to a traumatic life event. Alternatively, age differences in the sample may have made overprotection more relevant for adjusting to university life than to life as an adult. It is unclear if our results with respect to parental overprotection would

replicate in a community sample in which rates of trauma exposure were low. By contrast, parental challenge remained a predictor of generalized self-efficacy in the community sample, suggesting that the relationship between parental challenge and child outcomes may be less susceptible to environmental influences.

These findings have important clinical implications for parenting strategies that lead to well-being (e.g., flourishing and satisfaction with life) in children. Specifically, our findings suggest that parents should be encouraged to give children independence by challenging children to take on new and difficult experiences. Encouraging children to take on challenges may be particularly important in more impoverished communities. Additionally, our findings suggest that children with overprotective parents who did not challenge them to take risks may be more vulnerable to poorer perceived control and well-being later in life. Longitudinal research is needed to establish the causal relationships between parenting behaviors and child outcomes. Additionally, further research is needed to determine whether assessments of reports of parenting behaviors in early adolescents may help to identify those who would benefit from preventative interventions.

Our overprotection scale was strongly associated with the PBI, but also demonstrated some differences from the PBI. Namely, the PBI overprotection scales were more strongly correlated with measures of psychopathology in some instances than our overprotection scale. In developing the PFMS and PFMS-II, we aimed to develop items that differed from the PBI in two important ways. First, we aimed to create items that were behaviorally based rather than global impressions (e.g., "Tried to control everything I did") to reduce the likelihood that they would be influenced by current mood state. Second, we aimed to avoid items that would require participants to deduce their parents' intentions (e.g., "Did not want me to grow up"). It is possible that in doing so, we were successful in developing a measure that is less contaminated with neuroticism and psychopathology. Future research is needed to establish how our overprotection scale functions relative to the PBI overprotection scales, particularly in the extent to which these scales can predict observable parenting behaviors.

A number of limitations should be considered when interpreting our results. The current study used a cross-sectional design; therefore, we cannot determine the causal relationships between the observed constructs. It is possible that one's current sense of mastery and self-efficacy influences how individuals recall their early childhood experiences. However, we validated the original PFMS using sibling informants, and the expanded measure is highly correlated with the original measure. Additionally, our study relied exclusively on the use of self-report forms. Observational studies that assess parenting behaviors would help to provide greater support for the construct validity of the scale. In Study 2, a measure of PTSD symptoms was used to assess discriminant validity, and this measure differs somewhat from the published version of the scale. Accordingly, the reliability and validity of the PTSD measure we used are not well-established; however, the two versions of the PTSD scale are so similar that we think it unlikely that our results are invalidated by this difference.

Conclusion

The Parental Facilitation of Mastery Scale – II appears to be a reliable and valid measure of parenting behaviors that predict participants' self-efficacy and well-being later in life. The

measure captures two relevant domains: parental overprotection, which has been studied extensively using the Parental Bonding Instrument, and parental challenge, which has largely been overlooked to date. Our findings suggest that parenting interventions designed to promote well-being in children should not only aim to reduce parental overprotection, but should also teach parents ways to effectively challenge their children to take on difficult tasks and persist in the face of barriers. Future research should explore how different environmental factors impact the effects of parenting styles on perceived control and well-being.

Acknowledgments

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Appendix A. Parental Facilitation of Mastery Scale – II

The following questions ask about your childhood and teenage experiences. Think about the ways in which your parent(s) or primary guardian(s) helped to guide your activities and behavior during the first 16 years of your life.

During the first 16 years of life…

1)   my activities were strictly supervised

2)   I was encouraged to participate in physical sports

3)   I was encouraged to learn to take care of myself

4)   I was given household responsibility

5)   I was encouraged to try things on my own before getting help

6)   I was protected from unknown experiences

7)   I was encouraged to try something even if I wasn't sure I would succeed

8)   I was encouraged to develop a difficult skill

9)   I was allowed to spend time with friends without parental supervision

10)   decisions regarding my time and activities were made for me

11)   I was allowed to do things that my parent(s)/guardian(s) weren't familiar with

12)   I was encouraged to stick with things that were hard for me

13) I was allowed to dress how I wanted

14) I was given freedom to make independent decisions

15) I was sheltered from topics that might have been considered taboo or distressing

16) I had sleepovers at my friends' homes

17) I had little say in most things I did

Response Choices: Never = 1, Rarely = 2, Sometimes = 3, Often = 4, Always = 5

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Table 2

Multiple Imputation Estimated Means, Standard Deviations, Internal Consistency, and Correlations of Parenting Measures with Measures of Perceived Control and Psychopathology in the Undergraduate Sample

	Mean	SD	PFMS-II-OP	PFMS-II-C	PFMS-LP	PFMS-C	PBI-M	PBI-F
PFMS-II-OP	27.37	6.61	(.83)					
PFMS-II-C	27.28	4.36	−.32 ***	(.73)				
PFMS-LP	17.59	3.41	−.92 ***	.25 ***	(.70)			
PFMS-C	15.36	2.81	−.49 ***	.82 ***	.40 ***	(.62)		
PBI-M	12.99	7.37	.73 ***	−.28 ***	−.69 ***	−.38 ***	(.87)	
PBI-F	10.42	7.05	.60 ***	−.20 ***	−.52 ***	−.32 ***	.54 ***	(.86)
SMS	23.08	3.48	−.32 ***	.35 ***	.28 ***	.34 ***	−.37 ***	−.24 ***
GSE	32.28	4.56	−.30 ***	.40 ***	.28 ***	.41 ***	−.34 ***	−.26 ***
PSWQ	49.83	14.03	.06	−.05	−.07	−.04	.07	.16 **
DASS-D	8.86	9.69	.19 ***	−.14 **	−.16 **	−.13 **	.26 ***	.25 ***
DASS-A	6.91	7.98	.17 ***	−.09	−.13 **	−.09	.22 ***	.21 ***
DASS-S	12.36	9.20	.08	−.03	−.08	−.01	.17 ***	.22 ***

Note. $N = 387$. Cronbach's alpha values are presented in parentheses along the diagonal. PFMS-II-OP = Parental Facilitation of Mastery Scale – II: Overprotection Subscale; PFMS-II-C = Parental Facilitation of Mastery Scale – II: Challenge Subscale; PFMS-LP = Original Parental Facilitation of Mastery Scale: Low Protection Subscale; PFMS-C = Original Parental Facilitation of Mastery Scale: Challenge Subscale; PBI-M = Parental Bonding Instrument: Maternal Control; PBI-F = Parental Bonding Instrument: Paternal Control; SMS = Self-Mastery Scale; GSE = Generalized Self-Efficacy Scale; PSWQ = Penn State Worry Questionnaire; DASS-D = DASS-21: Depression Scale; DASS-A = DASS-21: Anxiety Scale; DASS-S = DASS-21: Stress Scale.

*
$p < .05,$

**
$p < .01,$

***
$p < .001.$

Table 3

Multivariate Multiple Regression of the PFMS-II Factors Predicting Measures of Perceived Control in the Undergraduate Sample

Variable	GSE			SMS		
	B	*SE*	*p*	*B*	*SE*	*p*
PFMS-II overprotection	−0.136	0.036	<.001	−0.128	0.028	<.001
PFMS-II challenge	0.361	0.055	<.001	0.220	0.042	<.001

Note. N = 387. GSE = Generalized Self-Efficacy Scale; SMS = Self-Mastery Scale.

Table 4

Study 2 Sample Characteristics

Variable	n (%)
Race (N = 168)	
African American	83 (49.4)
European American	79 (47.0)
American Indian/Alaskan Native	3 (1.8)
Hispanic	2 (1.2)
Native Hawaiian/Pacific Islander	1 (0.6)
Marital Status (N = 181)	
Never married	66 (36.5)
Married	57 (31.5)
Separated/Divorced	50 (27.6)
Widowed	8 (4.4)
Education	
9th – 12th grade, no diploma	13 (7.1)
High school graduate	29 (15.9)
Some college/Associate degree	69 (37.9)
Bachelor's degree	45 (24.7)
Master's/Doctorate degree	26 (14.3)
Household income (N = 176)	
< $10K	47 (26.7)
$10K-30K	45 (25.6)
$30K-50K	41 (23.3)
$50K-70K	25 (14.2)
> $70K	18 (10.2)
Trauma exposure	
Natural disaster	15 (8.2)
Fire or explosion	7 (3.9)
Transportation accident	36 (19.8)
Serious accident at work or recreational activity	23 (12.6)
Exposure to toxic substance	4 (2.2)
Physical assault	42 (23.1)
Assault with a weapon	12 (6.6)
Sexual assault	13 (7.1)
Other unwanted sexual experience	24 (13.2)
Exposure to combat or war zone	1 (0.6)
Captivity (e.g., kidnapped, prisoner of war)	3 (1.7)
Life threatening illness or injury	47 (25.8)
Severe human suffering	17 (9.3)
Sudden unexpected death of someone close to you	107 (58.8)
Serious injury, harm, or death that you caused to someone else	4 (2.2)

Variable	*n* (%)
Other event or stressful experience	103 (56.6)

Note. *N* = 182 unless otherwise indicated.

Table 5

Multiple Imputation Estimated Means, Standard Deviations, Internal Consistency, and Correlations of Parenting Measures with Measures of Perceived Control, Well-Being, and Psychopathology in the Community Sample

	Mean	SD	PFMS-II-OP	PFMS-II-C	PFMS-LP	PFMS-C
PFMS-II-OP	27.80	7.26	(.80)			
PFMS-II-C	24.70	5.45	$-.18^{*}$	(.79)		
PFMS-LP	16.59	4.12	$-.92^{***}$	.09	(.71)	
PFMS-C	12.29	3.75	$-.38^{***}$	$.85^{***}$	$.27^{***}$	(.74)
GSE	31.55	4.27	.04	$.31^{***}$	$-.02$	$.32^{***}$
LOT-R	15.77	5.40	.05	$.27^{***}$	.01	$.21^{**}$
SWLS	17.29	7.77	.08	$.18^{*}$	$-.03$	$.19^{**}$
FS	42.78	9.04	.06	$.35^{***}$	$-.03$	$.36^{***}$
PDS	21.79	13.91	.02	$-.10$	$-.04$	$-.14$

Note. N = 182. Cronbach's alpha values are presented in parentheses along the diagonal. PFMS-II-OP = Parental Facilitation of Mastery Scale – II: Overprotection Subscale; PFMS-II-C = Parental Facilitation of Mastery Scale – II: Challenge Subscale; PFMS-LP = Original Parental Facilitation of Mastery Scale: Low Protection Subscale; PFMS-C = Original Parental Facilitation of Mastery Scale: Challenge Subscale; GSE = Generalized Self-Efficacy Scale; LOT-R = Life Orientation Test – Revised; PDS = Posttraumatic Diagnostic Scale; SWLS = Satisfaction With Life Scale; FS = Flourishing Scale.

*
$p < .05$,

**
$p < .01$,

***
$p < .001$.