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Development and Psychometric Evaluation of the Paternal Involvement With Infants Scale

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A growing body of research reflects the need to focus on fathers' involvement with their infants. For many years, this was assessed by such domains as cohabitation, financial contributions, and/or asking mothers to rate the quality and quantity of the father's interactions with their children. Current scholarship has designated father involvement as a multifaceted construct, reflective of changing gender roles of men and fathers in the United States. However, there exists no self-report instrument of father's involvement with their infants that adequately measures the multifaceted components of the construct. The current project aims to develop a psychometrically sound, theoretically grounded instrument of father involvement. The Paternal Involvement With Infants Scale (PIWIS) is a self-report instrument that assesses a variety of ways in which new fathers are involved with their infant. In Sample 1, fathers of infants ($N = 456$) completed the PIWIS. Exploratory factor analyses ($n = 250$) and confirmatory factor analyses ($n = 206$) supported a 5-factor solution including positive engagement, indirect care, frustration, warmth and attunement, and control and process subscales. Sample 2 ($N = 57$) participants completed the PIWIS 4 weeks apart in order to provide test–retest reliability scores (r's $> .51$). Concurrent evidence of validity was established via significant positive correlations with theoretically related measures of social support, paternal engagement, infant care self-efficacy, parental alliance, parental satisfaction, and overall life satisfaction as well as negative correlations with gender role conflict and depression. Clinical implications and implications for future research are discussed.

Keywords: paternal involvement, scale development, father, infants, postpartum

Throughout the last few decades, changing gender roles and sociodemographic shifts in families within the United States (e.g., the increased role of women in the workplace) have influenced a cultural shift in which many men are taking on a greater portion of responsibility for the care of their children (W. L. Coleman, Garfield, & the American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health, 2004). There is evidence in the United States and United Kingdom that fathers are spending more time with their children than previous generations of fathers (Parker & Wang, 2013; Sevilla & Borra, 2015). The number of stay-at-home fathers continues to rise, up to 7% of fathers in 2015 from 4% in 1989 (Livingston, 2014). Those statistics are also reflective of changing gender roles and norms among fathers—a shift away from an exclusionary adherence to the breadwinner, provider, and disciplinarian roles and toward more involved, coparenting, and nurturing roles (Isacco, Garfield, & Rogers, 2010). Negative stereotypes of "deadbeat dads" have decreased as data from the Fragile Families and Child Wellbeing project have documented the nuanced and varied ways that fathers across residential, socioeconomic, and marital statuses are capable of being involved with their children (Yogman, Garfield, & the Committee on Psychological Aspects of Child and Family Health, 2016).

Across various child ages (infancy, toddler, adolescence), a robust body of literature has demonstrated that increased positive father involvement has a positive, significant influence on child developmental outcomes (Lamb, 2010). Fathers play a significant role in the cognitive, social, and emotional development of their children, especially during the first year of life (Parke, 1996). The

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infancy period is a time of joy, excitement, stress, and potential problems as families experience an intense transition with a new child (Cowan & Cowan, 1992). The stress and difficulty of the transition may help explain why some mothers and fathers develop postpartum depression (Paulson & Bazemore, 2010). Yet fathers may be able to assume positive roles in the family that protect against the development of psychopathology and experience new fatherhood as transformative (Garfield & Isacco, 2009; Knoester & Eggebeen, 2006). Indeed, results from several studies reflect that infants with involved, nurturing, and playful fathers tend to have higher IQs, more developed language and cognitive abilities, and enhanced emotional self-regulation throughout childhood (Cabrera, Shannon, & Tamis-LeMonda, 2007; McWayne, Downer, Campos, & Harris, 2013).

Although scholarly work on fatherhood in general and paternal involvement in particular are maturing areas, there is a noted lack of study focusing specifically on fathers and infants (Barry & Kochanska, 2010). A number of researchers have stressed the need to expand studies that push beyond the mother–infant relationship to a full-family approach that includes the father–infant relationship. Paternal involvement has been consistently related to a number of key psychosocial aspects of fatherhood including depression (Bronte-Tinkew, Moore, Matthews, & Carrano, 2007; Don & Mickelson, 2012; Isacco et al., 2010), the parental alliance (Feinberg, 2003), social support (Isacco et al., 2010), and paternal self-efficacy (de Haan, Prinzie, & Dekovic, 2009). Although life satisfaction has not been directly related to paternal involvement, previous research has shown it to be significantly positively associated with highly related constructs such as paternal self-efficacy (Rochlen, McKelley, Suizzo, & Scaringi, 2008). Although there is no known empirical work addressing gender role conflict and paternal involvement with infants, previous theory suggests that contemporary fathers working to balance new expectations of increased involvement in domestic duties may also experience gender role strain when also attempting to enact more traditional fatherhood roles (O'Neil & Lujan, 2009; Silverstein, Auerbach, & Levant, 2002).

Furthermore, past studies demonstrate associations between paternal involvement with infants, secure infant attachment, and decreased risk of externalizing behaviors at one year of age (Pruett, 2000; Ramchandani et al., 2013). These early gains are still evident when these infants reach adolescence (Trautmann-Villalba, Gschwendt, Schmidt, & Laucht, 2006; Yeung, Duncan, & Hill, 2000). Reflecting the benefits of fathers spending more time with their families and infant, the U.S. Department of Labor issued a recent policy statement (2015) advocating for increased paid paternity leave (Bureau of Labor Statistics, http://www.bls.gov).

Theory and Measurement of Father Involvement

Paternal "involvement" has been typically measured by whether or not the father resided in the household with the child and provided some type of financial assistance. In the last 30 years, two major models of paternal involvement have emerged to expand on such measurement. The first model of paternal involvement (Lamb, Pleck, Charnov, & Levine, 1985) consisted of three domains including paternal engagement (interacting directly with the child via play, caretaking, or leisure), accessibility (meaning being available) to the child, and responsibility (ensuring that the child is cared for and has adequate resources). This model emphasized the importance of active caregiving behaviors in addition to being a provider. Pleck (2010) provided a reconceptualization of paternal involvement to reflect more modern experiences of fathers. Pleck's reconceptualized model consisted of three primary domains of positive engagement activities, warmth and responsiveness, and control along with two "auxiliary domains" consisting of indirect care and process responsibility. Indirect care includes behaviors that are not directly interacting with their children, but involve arranging for the child to have important resources. Selecting a child care program, preschool, or school is the most frequently studied aspect of indirect care (Pleck, 2010). Process responsibility reflects a type of "meta-involvement" in which the father monitors the other four domains.

Despite the current conceptualization, there is not a corresponding self-report scale of the multidimensional construct. Studies are still relying on measuring paternal involvement by calculating the total amount of time men spend with their children, their financial contribution, residential status, mother report of paternal involvement, or inclusion of only one dimension of the construct (e.g., engagement; Day & Lamb, 2004; Fagan & Palkovitz, 2011). There are limitations to such approaches. For example, Day and Lamb (2004) analyzed how large-scale studies including the national evaluation of Early Head Start, the Fragile Families Study, and the Childhood Longitudinal Study—Birth Cohort measured father involvement. They concluded that researchers tend to use a mother–child template to study the father-child interaction, which does not account for the unique and varied ways that fathers are involved with their child (Day & Lamb, 2004; Yogman et al., 2016).

Coding self-report qualitative diaries of time spent in certain activities and having trained coders rate videotaped interactions yield useful information regarding paternal interactions with infants, yet these approaches are complex, costly, and do not allow for a direct understanding of the father's own perception of the extent to which he is involved in the care of his infant. Time diary data is often collapsed and reported as the total time fathers spend parenting, excluding important information on the specific activities fathers engage in while caring for their children. Multiple studies have found that total time spent with children is a poor predictor of children's developmental outcomes (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Pleck, 1997, 2010). Time study data of paternal involvement is disconnected from conceptualizations of paternal involvement, thus limiting the theoretical grounding.

A more nuanced and accurate understanding of the varied ways that fathers are involved with their child requires the use of subscale scores. For example, sole reliance on a total score from a frequency-based measure of engagement precludes the measurement of separate dimensions of paternal involvement (Pleck, 2010). Most analyses of dimensions of paternal involvement demonstrate that the three common primary components of paternal involvement (engagement, accessibility, and responsibility) are moderately interrelated (Pleck, 2010). However, support for unidimensionality versus multidimensionality is somewhat inconsistent. Ryan, Martin, and Brooks-Gunn (2006) concluded that activity engagement and warmth-responsiveness were elements of one dimension, whereas subsequent studies (e.g., Brown, McBride, Shin, & Bost, 2007) found only weak correlations. Pleck (2010) noted that inconsistencies about the dimensionality of the construct

is likely a function of several factors such as item wording, number of items, and demographics of the sample. Thus, empirical analysis of the construct benefits from a specific examination of the dimensionality given the specifics of the study design.

It is also important to note that mothers and fathers often have overlapping roles in family dynamics and as a result exert similar influences on child developmental outcomes. Indeed, several theorists have questioned the usefulness of conceptualizing mothers' and fathers' involvement behavior with their children in different ways. Pleck (2010, p. 36) summarizes this position: "Average differences by parental gender are not large, within-gender variation is substantial, and as a result the overlap in fathers' and mothers' distributions on parenting variables is considerable." Similarly, Fagan and colleagues' review (Fagan, Day, Lamb, & Cabrera, 2014) of the parental behavior literature concluded that there is not enough empirical evidence to support the idea that mothering and fathering involvement constructs are unique, and encouraged researchers to move toward gender-neutral formulations of parenting. However, the current study exclusively focuses on fathers' involvement with their infants. Therefore, it is important to describe how research and theory stemming from the "essential father" hypothesis relates to our study (Silverstein & Auerbach, 1999, p. 197).

The essential father hypothesis posits that "fathers are understood as having a unique and essential role to play in child development, especially for boys who need a male role model to establish a masculine gender identity" (Blankenhorn, 1995; Popenoe, 1996). In terms of unique effects on child development, some longitudinal, correlational studies have reported on the unique contributions that father involvement has made to child outcomes when controlling for mother involvement, mother engagement, and mother sensitivity (e.g., Amato & Rivera, 1999; Ramchandani et al., 2013; Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004). The unique roles of fathers in their families is likely to vary greatly, but some theory and research has indicated that active play and gross motor movements is a common parenting behavior that fathers engage in with their infant and children more so than mothers (Berger, 2009; Dixon et al., 1981; Hewlett, 1992; Lamb, 2010; MacDonald & Parke, 1986). According to "father–child activation" theory, active play with fathers fosters more control and risk-taking in toddlers (Paquette, 2004; Paquette & Dumont, 2013). Understanding that play was a primary component to father involvement over a 16-year longitudinal study, Grossmann and colleagues (2002) concluded that fathers and mothers likely impact children's sense of security in the attachment relationship in distinct ways. Given those theoretical and empirical influences, it made logical sense to conclude that it is likely that fathers assume distinct roles with their children and that their involvement has unique effects on their children's development. The same can be assumed for mothers as well as the likelihood that parents function similarly and have shared effects on their children's development. Therefore, we developed a parenting involvement instrument exclusively for fathers. We acknowledge that the existing literature is equivocal and that this study does not examine overlapping and distinct roles and involvement dimensions between mothers and fathers with infants. Rather, we drew on the existing scholarly literature in an effort to formulate a psychometrically sound self-report assessment of fathers' involvement with their infants.

Summary and Purpose of the Current Study

Assessment of paternal involvement has not kept pace with the current conceptualizations of paternal involvement as a multidimensional construct and has not adequately captured evolving gender norms for fatherhood. Additional limitations of existing measures include the lack of information regarding fathers' behavior and emotional experiences along with an overreliance on maternal reports of paternal involvement, time diaries, and measurement of a singular dimension. Therefore, the purpose of this study was to develop and evaluate a psychometrically sound self-report measure of paternal involvement grounded in Pleck's (2010) paternal involvement domains: The Paternal Involvement with Infants Scale (PIWIS). To our knowledge, the current study is the first to develop a theory-informed, self-report instrument measuring fathers' involvement with their infants.

Method

Item Development

The first step in developing the PIWIS involved generating a pool of items that reflected previous paternal involvement research (Lamb, 2010) and the five paternal involvement domains delineated by Pleck (2010; positive engagement activities, indirect care, warmth and responsiveness, control, and process responsibility). The initial bank of items was developed by having each of the researchers develop five items to reflect concrete behaviors related to each of the five paternal involvement domains in Pleck's (2010) model. Because the scale is intended to assess specific behaviors related to fathering infants during their first year postpartum, items were tailored to reflect common aspects of caring for infants (e.g., diapering, bathing, reading, playing, arranging for medical care, etc.). The authors aggregated all of the items into one pool and reviewed them in an iterative fashion to ensure their fit with the intended dimension. After deleting redundant items, the authors reached consensus on a 43 item pool.

The next step in PIWIS development involved having another panel of subject matter experts (different experts than those who participated in the initial item generation) review the items (as recommended in Streiner, Norman, & Cairney, 2014). The subject matter experts included four research professors of psychology with expertise in men and masculinity, one postdoctoral student engaged in early fatherhood studies, and three nonacademic fathers of infants. Each of these subject matter experts reviewed the initial PIWIS items and their intended dimensions and offered feedback regarding items to add, delete, or alter. Two of the experts (one professor and one nonacademic father) noted that the behavioral item referents did not assess a father's sense of his emotional involvement or frustration with his baby, and recommended several items that were intended to capture this dimension of paternal involvement. The researchers acted on this feedback by generating six items to assess the dimension of a father's sense of emotional involvement or frustration with his baby. Further discussion among the team members led to consensus regarding a pool of 49 items intended to measure the six dimensions.

The PIWIS response mode uses concrete temporal referents (1 = *Not At All*, 2 = *Rarely*, 3 = *Once or Twice A Month*, 4 = *A Few Times A Month*, 5 = *A Few Times A Week*, 6 = *About Once A Day*, 7 = *More than Once A Day*).

Participants and Procedures

The study consists of different samples. The first sample (Sample 1) was used to explore and confirm the PIWIS' multidimensional internal structure, provide evidence of internal consistency ($\alpha > .70$), and provide concurrent evidence of validity via theoretically consistent correlations with established covariates of general paternal involvement. The second sample (Sample 2) was used to provide evidence of moderate to strong (.50 to .80) 4-week test–retest reliability, given that the frequency of certain paternal involvement behaviors (e.g., feeding baby, taking baby to medical appointments, determining what media is appropriate for baby) should be expected to shift in response to the changing needs of one's partner and the child's rapid development at this early stage (see Bianchi, Robinson, & Milkie, 2007; Parke, 1996).

Sample 1. Following approval by the Institutional Review Board (IRB), 456 fathers were recruited by Qualtrics Panels. Qualtrics Panels utilizes a database of potential participants that was developed with multiple sampling techniques (e.g., recruitment in over 15,000 mobile applications, in person recruitment, telephone sampling, and pay-per-click website recruitment) to recruit convenience samples for online research. The panel service identified potential participants in their database and provided them with a link to the survey and an invitation to participate. Inclusion criteria included being a father, cohabiting with the child's other parent, and living with an infant between the ages of 0 and 12 months ($M = 6.86$, $SD = 3.32$). To improve representativeness of the sample, participants were recruited from panels throughout the United States using quotas to match the racial diversity of the 2013 U.S. Census. All participants in Sample 1 were recruited by the Qualtrics Panels service.

In terms of demographics, fathers' mean age was 32.4 years old ($SD = 5.3$). For 58.5% of the participants this was their first child, and 41.5% had previous children. 87.3% of the fathers worked full-time, 4.8% worked part-time, 1.5% were unemployed, 2.9% were stay-at-home fathers, 2.0% were students, 0.9% were disabled, and 0.7% indicated having an "other" employment status. 88.4% of the participants were married, 9.0% were partnered, 1.3% were single or dating, 0.2% were divorced, and 0.2% indicated having an "other" relationship status. Participants reported a mean household income of $86,432.46 ($SD = $52,673.02), and reported spending a mean of 54.8 ($SD = 54.2$) months in a relationship with the child's other parent. All of the participants self-identified as male, and 62.1% of their babies were reported to be male and 37.9% were reported to be female. Their ethnicity composition included 61.6% White/European American, 17.1% Hispanic/Latino, 12.9% Black/African American, 5.3% Asian/Asian American, 1.1% Native American or American Indian, and 2.0% Biracial or Multiracial.

Sample 2. An additional sample ($N = 57$) was recruited in order to conduct 4-week test–retest analyses. Participants in Sample 2 were recruited in the community using advertisements at pediatricians' offices as well as online via social media including Facebook and Reddit. Inclusion criteria were the same as for Sample 1, with fathers' mean age of 33.5 years ($SD = 5.5$), and babies' mean age of 11.2 weeks ($SD = 7.2$). All participants identified as males and were cohabiting with the babies' mothers. Ethnicity composition included 79.3% White/European, 6.9% Asian/Asian American, 5.2% Biracial/Multiracial, 3.4% Hispanic/Latino/a, 1.7% Black/African American, 1.7% "Other," and 1.7% declined to state their ethnicity. No other demographic information was collected in this sample, and these participants' scores were not included in any other analyses apart from test–retest reliability.

Measures

The Edinburgh Postnatal Depression Scale. The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) is a measure of postpartum depression. The scale consists of 10 items rated on a 0–4 Likert-type scale, with higher scores indicating more depressive symptoms. Due to the issue of managing participants' potential self-report of thoughts related to self-harm, one item ("The thought of harming myself has occurred to me") was omitted due to ethical concerns noted in the IRB application process. Full scale scores were determined by summing the remaining 9 items, resulting in a potential range of scores from 0 to 36. A sample item includes "In the past 7 days, I have blamed myself unnecessarily when things went wrong." Previous studies have shown the EPDS to have adequate internal consistency (Cronbach's alpha = .84) when completed by fathers of infants (Fisher, Kopelman, & O'Hara, 2012). In this study, the obtained mean was 0.9 ($SD = .56$) and Cronbach's alpha = .85.

The Parenting Sense of Competence Scale. (PSOC; Gibaud-Wallston & Wandersman, 1978). The PSOC is measure of a parent's overall sense of competence in child rearing tasks (Ohan, Leung, & Johnston, 2000). The scale consists of 17 items rated on a Likert-type scale (1 = *Strongly Disagree*; 7 = *Strongly Agree*). For this study, we examined the Parental Satisfaction Subscale, which contains nine items. Scores on this subscale reflect one's satisfaction with parenting a young child, with higher scores indicating a greater sense of parenting competence. A sample item includes "Being a parent is manageable, and any problems are easily solved." Previous studies (Johnston & Mash, 1989) have shown adequate internal consistency for the Paternal Satisfaction subscale (Cronbach's alpha = .75), and has shown significant positive correlations (Ohan et al., 2000; $r = .37$, $p < .01$) with measures of fathers' child rearing practices. In the current study, the obtained mean was 3.9 ($SD = 1.3$) and the Cronbach's alpha = .92.

The Self-Efficacy in Infant Care Scale. (SEICS; Froman & Owen, 1989). The SEICS is a measure of a parent's perceived ability to successfully and competently care for a baby's needs during the first 12 months of the infant's life. The scale consists of 40 items rated on a Likert-type scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*). For this study, we used the13-item Health Skills subscale, to measure paternal self-efficacy in caring for an infant's health needs, with higher scores indicating higher self-efficacy to care for an infant. A sample question from the Health Skills subscale includes "I am confident that I am able to decide when I should give my baby a tepid sponge when she/he has a fever." Previous studies (Prasopkittikun, Tilokskulchai, Sinsuksai, & Sitthimongkol, 2006) of the Health Skills subscale have shown adequate internal consistency (Cronbach's alpha = .89), and construct validity with fathers involvement was determined via regression analyses showing that this scale showed positive correlations with age and number of children (Froman & Owen, 1989). In this study, the obtained mean score was 3.8 ($SD = .9$) and the Cronbach's alpha = .94.

Satisfaction With Life Scale. (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). The SWLS is a measure of an individual's evaluation of satisfaction with his or her life. The scale consists of 5 items rated on a Likert-type scale (1–7; 1 = *Strongly Disagree*; 7 = *Strongly Agree*) and shows convergent validity with Campbell, Converse, and Rodgers' (1976) Semantic Differential Scale of life satisfaction (r = .75), with higher scores indicating more satisfaction with one's life. A sample item includes "In most ways, my life is close to my ideal." Previous studies (Pavot, Diener, & Suh, 1998) have shown the SWLS to have high internal consistency (Cronbach's alpha = .91). In this study, the obtained mean score was 5.5 (*SD* = 1.1) and the Cronbach's alpha = .88.

Gender Role Conflict Scale. (GRCS; O'Neil, Helms, Gable, David, & Wrightsman, 1986). The GRCS Scale consists of 37 items that assess the extent to which men experience stress related to conflict with traditional masculine gender roles. The response mode ranges from 6 = *Strongly Agree* to 1 = *Strongly Disagree*), and higher scores reflect a higher level of conflict experienced when violating traditional masculine gender roles. For this study, we used only the Restrictive Emotionality and Conflicts Between Work and Leisure—Family Relations subscales with 8 and 6 items, respectively. Previous research (O'Neil et al., 1986) has shown the Restrictive Emotionality subscale (Cronbach's alpha = .82) and the Conflicts Between Work and Leisure—Family Relations subscale (Cronbach's alpha = .75) to have adequate internal consistency. In this study, the obtained mean score was 3.4 (*SD* = 1.3) and the Cronbach's alpha = .95.

Multidimensional Scale of Perceived Social Support. (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). The MSPSS is a 16-item self-report scale that assesses respondents' perceived availability of social supports from friends, family, military peers, and intimate partners. MSPSS items are rated on a 7-point Likert-type scale (1 = *very strongly disagree* to 7 = *very strongly agree*). A sample item from the family support subscale is "I get the emotional help and support I need from my family." The MSPSS full-scale score has shown adequate internal consistency reliability in previous studies with a McDonald's (1999) omega hierarchical coefficient of .87 (Osman, Lamis, Freedenthal, Gutierrez, & McNaughton-Cassill, 2014). In this study, we did not include the military peers subscale, resulting in 12 items. In this study, the obtained mean score was 5.5 (*SD* = 1.1) with Cronbach's alpha = .94.

Parental Alliance Inventory. (PAI; Abidin & Brunner, 1995). The PAI is 20-item self-report survey to assess the degree to which parents believe that they have a sound working relationship with their child's other parent. The response mode ranges from 5 = *Strongly Agree* to 1 = *Strongly Disagree*, with higher scores reflecting a relatively higher perception of a good working relationship with their child's other parent. An example item includes "My child's other parent makes my job of being a parent easier." In previous studies, the PAI had demonstrated adequate internal consistency (Cronbach's alpha = .97), and has also been shown to have significant positive correlations with fathers' warm parenting style with their children (Abidin & Brunner, 1995). In this study, the obtained mean score was 4.3 (*SD* = .6) and Cronbach's alpha = .95.

Data Analysis

All 456 participants in Sample 1 were used to examine the PIWIS' concurrent evidence of validity. Sample 1 was split into Subsample A and Subsample B to facilitate factor analyses using independent samples (Worthington & Whittaker, 2006). Two hundred fifty Sample 1 participants were randomly selected to create Subsample A; the remaining 206 participants composed Subsample B.

Sample 1, Subsample A. SPSS (Version 20) was used to conduct a series of exploratory factor analyses (EFAs) on Subsample A to explore the initial factor structure of the instrument. We first conducted an EFA using principal axis factor (PAF) extraction and direct oblimin (oblique) rotation. One thousand random parallel analysis data sets were then computed. Parallel analysis and examination of scree plot were then used to arrive at a factor solution. Empirical (e.g., item loadings) and conceptual (e.g., theoretical alignment) criteria were then used to select items for the final version of the instrument. Next, a final EFA on the refined set of items was conducted, and internal consistency coefficients for all subscales calculated.

Sample 1, Subsample B. We used a series of CFAs on Subsample B to confirm the factor structure and determine the internal consistency of the instrument (Worthington & Whittaker, 2006). Four competing measurement models (i.e., one-factor, five-factor oblique, second-order, bifactor) were tested. Because items were measured on 7-point ordinal scales, we treated them as categorical variables and used the robust weighted least squares estimator. Model fit was evaluated using the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Weighted Root Mean Square Residual (WRMR; Hu & Bentler, 1999; Weston & Gore, 2006; Yu & Muthen, 2002). According to Weston and Gore (2006), the criteria for fit are as follows: CFI and TLI $>$ .95 for good fit and $>$ .90 for acceptable fit; and RMSEA $<$ .06 for good fit and $<$ .10 for acceptable fit. According to Yu and Muthen (2002), values close to or below 1.0 for the WRMR indicate good fit.

Sample 1, Subsample A and Subsample B combined. To examine concurrent evidence of validity for the PIWIS subscale scores, we examined the correlations between the five PIWIS subscale scores and the scores of instruments measuring theoretically related constructs. Previous research has shown that fathers' involvement with their babies and young children is positively correlated with reported social support (Bronte-Tinkew et al., 2007), parenting self-efficacy (P. K. Coleman & Karraker, 2003), the parental alliance (Isacco et al., 2010), parenting satisfaction (Cole & Singley, 2015), and overall life satisfaction (Goeke-Morey & Cummings, 2007). Studies have also reported negative correlations between paternal involvement with infants and fathers' self-reported depression (Bronte-Tinkew et al., 2007) and gender role conflict (Levant & Pollack, 1995). Although these seven criterion variables have been found to relate to overall paternal involvement, the literature does not provide clear theoretical or empirical guidance on how the specific dimensions of paternal involvement measured by the PIWIS should correlate with these seven criterion variables. Therefore, to remain consistent with the literature on overall paternal involvement, we hypothesized positive correlations between the five PIWIS subscales and self-efficacy, parenting alliance, social support, life satisfaction, and parenting satisfaction. We also hypothesized negative correlations between the five PIWIS subscales and gender role conflict and depression.

Sample 2. To assess the temporal stability of PIWIS subscale scores, test–retest reliability was calculated for a subset ($N = 57$) of participants who completed the PIWIS four weeks after the initial administration.

Study and consent procedures were approved in accordance with Chatham University's Institutional Review Board, project # 1596, title "Toward a Unified Model of Men's Adjustment to Fatherhood."

Results

Exploratory Factor Analysis

Eigenvalues for the first five factors were higher in the actual data set (i.e., 11.27, 9.39, 2.69, 1.91, 1.74, 1.28) than in the parallel analysis (i.e., 1.99, 1.89, 1.81, 1.72, 1.69, 1.64). These results and the scree plot supported a five-factor solution.

Approximate simple structure is demonstrated when each factor is composed of several (i.e., ≥ 3) items that load ≥ .32 on the primary factor, load ≤ .32 on the other factors, and load at least .15 higher on the primary factor than on the other factors (Worthington & Whittaker, 2006). Examination of the pattern coefficients (see Table 1) revealed that at least 3 items loaded on each of the five factors based on these item retention criteria. The initial variance accounted for by the five factors (55.10% in total) was as follows: 22.99%, 19.17%, 5.48%, 3.90%, and 3.54%. The first factor primarily consisted of items from Pleck's Positive Engagement dimension (i.e., "Positive Engagement"). The second factor consisted of items from the Indirect Care dimension (i.e., "Indirect Care"). The third factor primarily consisted of negatively keyed items from the Emotional Involvement dimension (i.e., "Frustration"). These Frustration items were reverse-coded in all subsequent analyses to retain consistency of valence with the other items, such that higher scores on the Frustration items indicate less self-reported frustration. The fourth factor consisted of items from the Warmth and Emotional Involvement dimensions ("Warmth & Attunement"). The fifth factor consisted of items from the Control and Process Responsibility dimensions (i.e., "Control & Process Responsibility"). Use of varimax (orthogonal) rotation resulted in a similar pattern of item loadings. In summary, although items were initially generated to measure six theoretical dimensions, these factor analysis results indicate that is it more empirically sound to conceptualize these items as measuring five theoretical dimensions. Such an outcome is common in scale development (e.g., Lewis & Neville, 2015), and demonstrates the cyclical nature of how theory guides measurement and vice versa.

Regarding item retention, we sought to create a measure that minimizes participant burden, aligns with the guiding theory of the instrument, and provides coverage of the breadth of the content domain defined by the six dimensions (i.e., Pleck's, 2010 dimensions plus emotional involvement/frustration). Fourteen items were dropped to create the final version of the instrument (i.e., PIWIS-35), as follows. First, seven items that failed to meet the above item retention criteria were dropped. Second, a Control item ("Running errands while your baby is with you") that attempted to load inversely onto the Indirect Care factor was dropped due to inadequate conceptual consistency with other items on the factor (Worthington & Whittaker, 2006). Third, a Warmth item ("Playing with your baby") was dropped because it was redundant with a stronger loading item ("Interactive playing with your baby [e.g., "using stuffed animals or other toys]") on the Warmth & Attunement factor (Clark & Watson, 1995). Fourth, two Warmth items ("Your baby becomes calmer when you attempt to soothe her/him"; "Feeling that your baby is attached to you") were dropped from the Warmth & Attunement factor because the items did not measure the father's self-report behavior, the construct of interest (i.e., these items contained construct-irrelevant variance; American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014). Fifth, a Control item ("Monitoring your baby while also doing other activities in the house") was dropped from the Warmth & Attunement factor due to inadequate conceptual consistency with other items on the factor. Sixth, a Process Responsibility item ("Monitoring safety information regarding what toys are appropriate/safe for your baby") and a Control item ("Decision making for establishing systems regarding your baby's safety [choosing car seat, cabinet latches, baby gates, gauging appropriateness of toys, etc.]") were dropped from the Control & Process Responsibility factor because they were redundant with an existing item ("Determining which toys/play objects are appropriate for baby") on the Control & Process Responsibility factor that was less prone to cross-loading on other factors.

A new EFA using PAF extraction and direct oblimin (oblique) rotation was conducted on this refined set of 35 items. The initial variance accounted for by the five factors (58.53% in total) was as follows: 26.05%, 16.70%, 6.88%, 4.66%, and 4.23%. All items loaded on their respective factors and met item retention criteria. Table 2 presents the factor loadings, initial communality estimates, corrected item-total correlations, *M*, and *SD* for the items, as well as the *M*, *SD*, internal consistency, and factor intercorrelations of the five factors. Internal consistency estimates ranged from $\alpha = .81$ to $\alpha = .92$. Factor intercorrelations highlight that some factors are positively correlated whereas others are inversely correlated, suggesting that neither a second-order model nor a bifactor model are likely to account for the covariation of the items. A copy of the PIWIS is provided in the Appendix.

Confirmatory Factor Analysis

Both the bifactor model and second-order models did not produce interpretable results: The second-order model produced a latent variable covariance matrix that was not positive definite, and the bifactor model did not converge. This makes sense in light of the mix of positive and negative factor intercorrelations found with Subsample A. Given that the bifactor model did not converge, we ran the bifactor model using all 456 participants of Sample 1. The bifactor model converged and demonstrated poor fit, $\chi^2[525] = 3904.02$, $p < .001$; RMSEA = .12 [90% CI of .115, .122], CFI = .84, TLI = .82, WRMR = 2.51.

The unidimensional model demonstrated poor fit, $\chi^2[560] = 3311.47$, $p < .001$; RMSEA = .15 [90% CI of .15, .16], CFI = .72, TLI = .71, WRMR = 2.67. The five-factor oblique model demonstrated adequate fit, $\chi^2[550] = 1339.99$, $p < .001$; RMSEA = .08 [90% CI of .08, .09], CFI = .92, TLI = .91, WRMR =

Table 1
Factor Loadings for Five-Factor Exploratory Factor Analysis of the 49 PIWIS Items

Item	Factor				
	PE	IC	F	WA	CPR
PIWIS2 Changing your baby's diaper	**.59**	−.11	.05	.22	−.07
PIWIS7 Burping your baby	**.56**	−.01	−.07	.04	−.14
PIWIS8 Putting your baby down for nap/sleep	**.51**	−.17	.00	.18	−.32
PIWIS11 Feeding your baby	**.48**	−.03	.04	.19	−.14
PIWIS1 Bathing your baby	**.47**	.27	−.15	−.10	−.16
PIWIS4 Reading to/with your baby	**.45**	.19	.01	.11	−.07
PIWIS9 Waking up during the night to take care of your baby	**.42**	.24	−.11	.09	−.20
PIWIS5 Swaddling your baby	**.40**	.25	−.10	.03	−.02
PIWIS31 Taking your baby to/picking up from child care	.21	**.75**	.07	−.09	.13
PIWIS45 Arranging for child care (e.g., babysitter, day care)	.20	**.66**	−.02	−.20	.00
PIWIS32 Taking your baby to medical appointments	.06	**.59**	−.17	−.17	−.10
PIWIS44 Arranging for your baby to attend medical care visits	−.15	.58	−.07	−.10	−.41
PIWIS43 Setting appointments for your baby's medical care	−.15	.56	−.07	−.09	−.44
PIWIS46 Determining when your baby needs new clothes because s/he has outgrown them	.06	.50	−.15	−.16	−.36
PIWIS30 Bringing your baby along with you to one of your own leisure activities away from home	−.06	**.47**	−.20	.26	−.15
PIWIS26 Feeling jealous of your partner's connection with your baby*	−.01	−.07	**.80**	.18	−.07
PIWIS22 Feeling frustrated when caring for your baby*	−.04	.20	**.78**	.13	.03
PIWIS27 Giving your baby to your partner or other caregiver when your baby is crying*	−.02	.08	**.68**	−.06	−.16
PIWIS13 Feeling resentful of your baby due to increased responsibilities*	.05	−.23	**.56**	.15	.01
PIWIS14 Running errands while your baby is with you	.14	.26	−.37	.14	−.09
PIWIS18 Kissing your baby	.05	.07	.08	**.87**	.10
PIWIS20 Feeling close to your baby	−.06	−.08	.03	**.79**	−.04
PIWIS24 Smiling at your baby	−.03	−.07	.03	**.78**	.03
PIWIS19 Responding to your baby's facial expressions so that s/he can see your response	.02	−.09	.06	**.78**	−.01
PIWIS28 Feeling that your involvement with your baby is important	.00	−.05	.09	**.75**	.01
PIWIS17 Interactive playing with your baby (e.g., using stuffed animals or other toys	.06	.13	.02	**.72**	.02
PIWIS23 Laughing with your baby	−.12	.00	.06	**.72**	−.11
PIWIS10 Hugging your baby	.19	.01	.08	**.66**	.08
PIWIS12 Missing your baby when you are not with her/him	.06	.08	−.01	**.63**	.04
PIWIS3 Playing with your baby	.24	−.15	.05	**.59**	−.01
PIWIS6 Talking to your baby	.21	−.20	.06	**.58**	.11
PIWIS29 Your baby becomes calmer when you attempt to soothe her/him	−.05	.05	.04	**.58**	−.14
PIWIS21 Feeling that your baby is attached to you	−.08	−.06	−.02	**.57**	−.04
PIWIS16 Soothing your baby when s/he is crying	.27	.10	−.15	**.56**	.04
PIWIS25 Monitoring your baby while also doing other activities in the house	.17	−.20	−.09	**.47**	−.14
PIWIS42 Making decisions regarding your baby's well-being	−.01	−.20	.01	.06	**−.69**
PIWIS35 Monitoring safety information regarding what toys are appropriate/safe for your baby	−.06	.20	.04	.06	**−.67**
PIWIS39 Setting your baby's general schedule/activities	.05	.07	−.04	.04	**−.65**
PIWIS47 Determining which toys/play objects are appropriate for baby	.08	.10	.00	−.05	**−.65**
PIWIS48 Anticipating specific ways (monitoring health, availability of clothes, have proper amount/type of food, etc.) to assure that your baby's needs will be taken care of	.22	−.09	−.01	−.09	**−.65**
PIWIS34 Decision making for establishing systems regarding your baby's safety (choosing car seat, cabinet latches, baby gates, gauging appropriateness of toys, etc.)	−.04	.20	−.05	.04	**−.60**
PIWIS37 Determining what media (TV, DVD's, music) is appropriate for your baby	−.02	.20	.16	.05	**−.60**
PIWIS36 Determining when to feed your baby	.23	−.13	.09	.02	**−.57**
PIWIS40 Knowing what foods (milk, formula, soft food) to give your baby and how much s/he eats	.21	−.09	.15	.00	**−.53**
PIWIS41 Making decisions regarding your baby's medical care (e.g., selecting a pediatrician or which vaccinations to have administered)	−.02	.33	−.10	−.07	−.52
PIWIS49 Discuss the division of parenting responsibilities with your partner	.14	.14	−.05	−.05	**−.48**
PIWIS38 Buying new goods (toys, furniture, bottles, media, etc.) for your baby	−.04	.44	−.10	.01	−.46
PIWIS33 Choosing play activities for your baby	.15	−.05	−.01	.16	**−.43**
PIWIS15 Taking direct action to prevent harm to your baby	−.04	−.03	−.15	.21	−.32

Note. Results of exploratory factor analysis using principal axis factor extraction with oblique rotation (direct oblimin) when five factors were specified for extraction. $N = 250$. Bold loadings indicate the strongest factor loadings for each item that met established item retention criteria. Bold items indicate items retained for the PIWIS-35. PIWIS = Paternal Involvement With Infants Scale; PE = Positive Engagement; IC = Indirect Control; F = Frustration; WA = Warmth & Attunement; CPR = Control & Process Responsibility.
* Reverse-scored items.

Table 2
Items, Factor Loadings, Initial Communality Estimates, Corrected Item-Total Correlations, Means, Standard Deviations, Factor Internal Consistency, and Factor Intercorrelations for the PIWIS-35

Item	Sample 1 (N = 250)								
	PE	IC	F	WA	CPR	h^2	Item-total r	M	SD
7 Burping your baby	**.71**	−.09	−.04	−.04	.02	.54	.46	5.88	1.52
2 Changing your baby's diaper	**.57**	−.13	.07	.21	.04	.61	.55	6.23	1.20
8 Putting your baby down for nap/sleep	**.51**	−.15	.03	.15	.28	.44	.63	6.04	1.14
4 Reading to/with your baby	**.50**	.16	.04	.08	.03	.52	.46	5.43	1.44
9 Waking up during the night to take care of your baby	**.50**	.16	−.09	.04	.17	.55	.51	5.38	1.56
5 Swaddling your baby	**.49**	.21	−.07	−.01	−.01	.43	.34	5.32	1.86
11 Feeding your baby	**.48**	−.03	.07	.16	.14	.57	.54	6.02	1.37
1 Bathing your baby	**.45**	.23	−.14	−.10	.20	.54	.38	4.99	1.34
31 Taking your baby to/picking up from child care	.08	**.90**	.08	.03	−.06	.65	.16	3.81	2.31
45 Arranging for child care (e.g., babysitter, day care)	.08	**.69**	−.05	−.12	.12	.67	.14	3.76	2.01
32 Taking your baby to medical appointments	.02	**.57**	−.20	−.14	.20	.58	.09	3.87	1.57
26 Feeling jealous of your partner's connection with your baby*	.02	−.10	**.84**	.08	.00	.68	.20	4.87	2.23
22 Feeling frustrated when caring for your baby*	−.04	.16	**.79**	.06	−.06	.55	.17	4.09	2.19
27 Giving your baby to your partner or other caregiver when your baby is crying*	.01	.06	**.70**	−.12	.08	.44	.17	3.44	1.92
13 Feeling resentful of your baby due to increased responsibilities*	−.02	−.19	**.52**	.15	−.03	.55	.13	4.60	2.28
18 Kissing your baby	.04	.03	.03	**.88**	−.05	.78	.54	6.58	.87
19 Responding to your baby's facial expressions so that s/he can see your response	−.03	−.10	.02	**.79**	.07	.77	.50	6.50	.86
24 Smiling at your baby	−.05	−.08	.02	**.77**	.01	.65	.43	6.54	.94
20 Feeling close to your baby	−.07	−.10	.00	**.76**	.09	.70	.47	6.58	.81
17 Interactive playing with your baby (e.g., using stuffed animals or other toys	−.01	.15	−.02	**.75**	.04	.63	.51	6.30	1.05
23 Laughing with your baby	−.14	.02	.04	**.72**	.13	.62	.45	6.44	.99
28 Feeling that your involvement with your baby is important	.00	−.09	.07	**.71**	.03	.59	.46	6.38	1.01
10 Hugging your baby	.15	.02	.07	**.67**	−.05	.64	.50	6.55	.97
12 Missing your baby when you are not with her/him	.10	.06	−.01	**.62**	−.04	.51	.42	6.19	1.17
6 Talking to your baby	.22	−.23	.08	**.55**	−.13	.61	.37	6.59	.84
16 Soothing your baby when s/he is crying	.29	.04	−.17	**.54**	−.01	.57	.49	6.30	1.08
47 Determining which toys/play objects are appropriate for baby	−.11	.17	−.06	.03	**.77**	.63	.49	4.99	1.49
39 Setting your baby's general schedule/activities	−.02	.06	−.08	.04	**.71**	.58	.51	5.23	1.38
48 Anticipating specific ways (monitoring health, availability of clothes, have proper amount/type of food, etc.) to assure that your baby's needs will be taken care of	.09	−.03	−.04	−.05	**.71**	.60	.52	5.32	1.35
42 Making decisions regarding your baby's well-being	−.04	−.15	.01	.06	**.66**	.43	.45	5.90	1.22
37 Determining what media (TV, DVD's, music) is appropriate for your baby	−.01	.20	.12	.05	**.56**	.56	.49	5.26	1.67
36 Determining when to feed your baby	.21	−.12	.08	−.01	**.55**	.52	.53	5.70	1.46
40 Knowing what foods (milk, formula, soft food) to give your baby and how much s/he eats	.19	−.13	.15	−.04	**.53**	.53	.50	5.80	1.26
49 Discuss the division of parenting responsibilities with your partner	.11	.16	−.08	−.02	**.47**	.46	.41	4.98	1.54
33 Choosing play activities for your baby	.08	.04	−.01	.18	**.45**	.47	.49	5.78	1.21
Factor Mean	5.66	3.81	4.25	6.45	5.44				
Factor Standard Deviation	.96	1.72	1.73	.73	.96				
Factor Internal Consistency (Cronbach Alpha)	.82	.83	.81	.92	.86				
PE Interfactor Correlations	1.00								
IC Interfactor Correlations	.17	1.00							
F Interfactor Correlations	−.09	−.27	1.00						
WA Interfactor Correlations	.38	−.26	.27	1.00					
CPR Interfactor Correlations	.47	.21	.01	.23	1.00				

Note. Results of exploratory factor analyses using principal axis factor extraction with oblique rotation (direct oblimin) when five factors were specified for extraction. Bold loadings indicate the strongest factor loadings for each item that met established item retention criteria. PE = Positive Engagement; IC = Indirect Control; F = Frustration; WA = Warmth & Attunement; CPR = Control & Process Responsibility.

1.46. These CFA results suggest that the PIWIS-35 best conforms to the five-factor oblique structure identified by the EFA. Standardized factor loadings of the five-factor oblique model ranged from .42 to .91, internal consistency estimates ranged from α = .77 to α = .92, and factor intercorrelations ranged from −.57 to .81 (see Table 3). In summary, results from Subsample A and Subsample B support the internal consistency of the five subscales and provide structural evidence of validity.

Table 3
Standardized Factor Loadings and Internal Consistency for Five-Factor Oblique Model of the PIWIS-35

Item	Factor				
	PE	IC	F	WA	CPR
7 Burping your baby	.72				
2 Changing your baby's diaper	.78				
8 Putting your baby down for nap/sleep	.83				
4 Reading to/with your baby	.59				
9 Waking up during the night to take care of your baby	.60				
5 Swaddling your baby	.58				
11 Feeding your baby	.78				
1 Bathing your baby	.42				
31 Taking your baby to/picking up from child care		.84			
45 Arranging for child care (e.g., babysitter, day care)		.82			
32 Taking your baby to medical appointments		.85			
26 Feeling jealous of your partner's connection with your baby*			.94		
22 Feeling frustrated when caring for your baby*			.69		
27 Giving your baby to your partner or other caregiver when your baby is crying*			.58		
13 Feeling resentful of your baby due to increased responsibilities*			.69		
18 Kissing your baby				.78	
19 Responding to your baby's facial expressions so that s/he can see your response				.90	
24 Smiling at your baby				.88	
20 Feeling close to your baby				.91	
17 Interactive playing with your baby (e.g., using stuffed animals or other toys				.86	
23 Laughing with your baby				.86	
28 Feeling that your involvement with your baby is important				.83	
10 Hugging your baby				.88	
12 Missing your baby when you are not with her/him				.62	
6 Talking to your baby				.83	
16 Soothing your baby when s/he is crying				.82	
37 Determining what media (TV, DVD's, music) is appropriate for your baby					.77
36 Determining when to feed your baby					.85
40 Knowing what foods (milk, formula, soft food) to give your baby and how much s/he eats					.77
49 Discuss the division of parenting responsibilities with your partner					.55
33 Choosing play activities for your baby					.76
Factor Mean	5.88	4.02	4.31	6.49	5.58
Factor Standard Deviation	.78	1.81	1.72	.65	1.06
Factor Internal Consistency (Cronbach Alpha)	.77	.84	.80	.92	.88
PE Interfactor Correlations	1.00				
IC Interfactor Correlations	.36	1.00			
F Interfactor Correlations	.06	−.57	1.00		
WA Interfactor Correlations	.81	−.11	.42	1.00	
CPR Interfactor Correlations	.78	.53	−.02	.59	1.00

Note. Results of confirmatory factor analysis using WLSMV estimation. $N = 206$. All loadings were significant at $p < .001$. PIWIS = Paternal Involvement With Infants Scale; PE = Positive Engagement; IC = Indirect Control; F = Frustration; WA = Warmth & Attunement; CPR = Control & Process Responsibility.
* Reverse-scored.

Concurrent Evidence of Validity for the PIWIS Subscale Scores

After determining that a five-factor solution was most appropriate, evidence of convergent validity was examined by exploring the degree and direction of associations between the five PIWIS subscales[1] and a number of related constructs. Isacco and colleagues (2010) found that depression was negatively associated with parent–child interaction. Thus, a small negative association was expected between the five PIWIS subscales and scores on the EPDS. Although there is no known research that directly links paternal satisfaction as measured by the Satisfaction subscale of the PSOC, based on the above-cited research on depression (which is conceptually the opposite of satisfaction), we reasoned that scores on this scale would likely show a small positive association with the PIWIS subscales. Previous studies have demonstrated that parenting self-efficacy is positively associated with engaged parenting, therefore, a small positive association was predicted between the five PIWIS subscales and scores on the SEICS (Donovan & Leavitt, 1985; Donovan, Leavitt, & Walsh, 1997; Mash & Johnston, 1983). To date, no published research has examined relations between gender role conflict and paternal involvement, but past studies have found that experiences of gender role conflict are associated with decreased parenting satisfaction and parenting

[1] The PIWIS Frustration Subscale was reverse coded for this analysis, with higher scores indicating lower levels of frustration.

self-efficacy (Alexander, 1999). Furthermore, the authors of the current study theorize that endorsement of traditional masculine norms may conflict with positive engagement behaviors, emotional connection to infants, and engagement in indirect care due to men's fear of being perceived as feminine for engaging with their infants. Thus, it was hypothesized that the five subscales of the PIWIS would be negatively correlated to scores on the GRCS. Multiple studies have found that partner support is significantly and positively associated with paternal effectiveness (Aycan & Eskin, 2005; Isacco et al., 2010). Therefore, small positive associations were expected between scores on the five PIWIS subscales and scores on the MSPSS. Paternal well-being is an underrepresented field of research, however; Aycan and Eskin (2005) found a small positive association between time spent with children and well-being. As a result, a small positive correlation was predicted between the five PIWIS subscales and the SWLS. Lastly, past studies of parenting alliance have shown parenting alliance is a significant and positive predictor of father involvement (McBride & Rane, 1998). Thus, a small but positive association was expected between the five PIWIS subscales and Scores on the PAI.

As seen in Table 4, the Positive Engagement subscale correlated in theoretically expected ways with five criterion variables, but was not correlated with parenting satisfaction or depression. The Indirect Care subscale correlated in theoretically expected ways with one criterion variable, but correlated negatively with parenting satisfaction, correlated positively with gender role conflict and depression, and was not correlated with parenting alliance or social support. The Frustration subscale correlated in theoretically expected ways with five criterion variables, but was not significantly correlated with social support or life satisfaction. The Warmth and Attunement subscale correlated in theoretically expected ways with all seven criterion variables. The Control and Process Responsibility subscale correlated in theoretically expected ways with four criterion variables, but was not correlated with parenting satisfaction, gender role conflict, or depression.

Test–Retest Reliability of the PIWIS Subscale Scores

The four-week test–retest reliability for the PIWIS subscale scores were as follows (all $ps < .001$): Positive Engagement $r = .58$, Indirect Care $r = .59$, Frustration $r = .51$, Warmth and Attunement $r = .74$, and Control and Process Responsibility $r = .73$. As anticipated, these test–retest correlation coefficients suggest that some PIWIS subscale scores are fairly stable while others exhibit moderate change over the four-week testing period.

Discussion

Measuring paternal involvement has not kept pace with the broadening familial roles of fathers and current conceptualizations of the construct (Schoppe-Sullivan, McBride, & Ho, 2004). The purpose of this study was to develop a psychometrically sound and theoretically grounded self-report measurement of paternal involvement with infants. We used Pleck's (2010) reconceptualization of paternal involvement as well as input from content experts to guide item development. EFA and CFA suggested that the PIWIS is best conceptualized as a multidimensional instrument with five related but independent subscales that measure five theory-based dimensions of paternal involvement: Positive Engagement, Indirect Care, Frustration, Warmth and Attunement, and Control and Process Responsibility. These five subscales demonstrated adequate internal consistency ($\alpha = .77$ to .92) and moderate to strong 4-week test–retest reliability ($r = .51$ to .74). As noted previously, the more moderate test-reliability coefficients for certain subscales make sense, given that the frequency of certain paternal involvement behaviors (e.g., feeding baby) should be expected to shift over the four-week testing period in response to the changing needs of one's partner and the child's rapid development at this early stage (see Bianchi et al., 2007; Parke, 1996).

In regard to concurrent evidence of validity, the paternal involvement literature provides guidance on how general paternal involvement should be expected to correlate with key cri-

Table 4
Correlations, Means, and Standard Deviations for Concurrent and Divergent Validity

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. PIWIS-PE	—											
2. PIWIS-IC	.30**	—										
3. PIWIS-F	−.07	−.39**	—									
4. PIWIS-WA	.47**	−.18**	.28**	—								
5. PIWIS-CPR	.60**	.36**	−.04	.34**	—							
6. ICSE	.20**	.04	.17**	.28**	.26**	—						
7. PAI	.20**	−.09	.23**	.51**	.23**	.32**	—					
8. PSCS	.05	−.38**	.65**	.34**	.01	.23**	.23**	—				
9. MSPSS	.20**	.08	.05	.26**	.22**	.21**	.40**	.14**	—			
10. SWLS	.22**	.29**	.02	.10*	.23**	.35**	.28**	.10*	.44**	—		
11. GRCS	−.11*	.28**	−.48**	−.27**	−.08	−.26**	−.20**	−.67**	−.22**	−.14**	—	
12. EDPS	−.04	.34**	−.48**	−.34**	.04	−.16**	−.27**	−.66**	−.28**	−.24**	.59**	—
M	6.47	5.50	4.28	3.91	5.76	49.39	86.10	34.70	66.55	27.57	46.85	8.34
SD	.69	1.01	1.72	1.76	.89	11.71	11.37	11.49	12.23	5.58	18.13	5.07

Note. PIWIS-WA = Paternal Involvement With Infants Scale Warmth and Attunement Subscale; PIWIS-CPR = Paternal Involvement With Infants Scale Control and Process Responsibility Subscale; PIWIS-FR = Paternal Involvement With Infants Scale Frustration Subscale; PIWIS-IC = Paternal Involvement With Infants Scale Indirect Care Subscale; PIWIS-PE = Paternal Involvement With Infants Scale Positive Engagement Subscale; ICSE = Indirect Care Self-Efficacy Subscale; PAI = Parenting Alliance Inventory; PSCS = Parenting Satisfaction subscale; MSPSS = Social Support Scale; SWLS = Satisfaction With Life Scale; GRCS = Gender Role Conflict Scale; EDPS = Edinburgh Postnatal Depression Scale.
* $p < .05$. ** $p < .01$.

terion variables (i.e., Parenting Alliance, Parental Satisfaction, Social Support, Satisfaction With Life, Parenting Self-Efficacy, Gender Role Conflict, Depression). However, it does not provide adequate guidance on how each of the five dimensions of paternal involvement captured by the PIWIS should be expected to differentially correlate with these criterion variables. Thus, it seemed most prudent to offer blanket hypotheses in which all subscales were hypothesized to correlate with the criterion variables in similar ways, knowing that the data would reveal a more complex reality. All subscales except the Indirect Care subscale demonstrated the theoretically anticipated correlations with the majority of the criterion variables, providing initial concurrent evidence of validity for these four subscales. The Indirect Care subscale's theoretically unanticipated correlations make more sense upon closer inspection of the three Indirect Care items: These items capture what are arguably more mundane or stressful behaviors. Thus, it seems understandable that the more frequent performance of these behaviors would be positively associated with greater depression and gender role conflict, less parenting satisfaction, and not related to self-efficacy, parenting alliance, or social support. Taken as a whole, the present results provide initial support for the reliability and validity of the PIWIS subscale scores.

The broader implication is that our five-factor model steeped in a multifaceted conceptualization of paternal involvement contributes to existing theory and research that has indicated that paternal involvement is a multidimensional construct. For example, the PIWIS measured more than paternal financial contributions to their child, time spent with their infant, or simple "clicks and ticks" of engagement behaviors (Hawkins & Palkovitz, 1999). Along with the multiple components of the PIWIS, strength of the PIWIS is in the design as a father self-report scale. Currently, paternal involvement is often assessed via mother report and can lead to differing results (Coley & Morris, 2002; Mikelson, 2008). The PIWIS more accurately assesses paternal involvement from the perception of the father. Therefore, our primary conclusion is that the PIWIS is a suitable self-report survey for researchers and practitioners to use to measure paternal involvement with their infants.

Based on mean scores of the PIWIS subscales, the average father in our sample reported involvement in Positive Engagement activities a few times a week, whereas he engaged in Indirect Care behaviors once or twice per month. Frustration subscale scores reflected having these types of experiences a few times per month, whereas Warmth & Attunement behaviors showed the highest frequency of paternal involvement at more than once per day. Finally, mean scores showed that the average father engaged in Control & Process Responsibility behaviors a few times each week. Although the response mode and scoring of PIWIS subscales is such that higher mean scores on each subscale reflect relatively higher levels of engagement, it is important to recognize that the specific behaviors will naturally vary in how much a father does them with a healthy baby. One would expect certain behaviors to happen more frequently than others; for example, the caretaking behaviors included in the Warmth & Attunement subscale (burping, feeding, bathing, etc.) would very likely be performed once a day or even more frequently. On the other hand, Indirect Care items such as arranging for child care and taking the child to medical appointments reflect behaviors that logically would be less frequent. In this sense, a lower overall mean score reflecting engaging in Indirect Care activities once or twice per month is not necessarily a reflection of poorer-quality involvement. PIWIS subscale score means should not be directly compared with each other in the sense that overall mean subscale scores do not reflect relatively "better" involvement in one area than another. On the other hand, an inspection of these mean subscale scores with a nationally representative sample does reflect a more nuanced picture of the frequency of specific early fatherhood involvement behaviors than does previous research examining simply financial contribution or time spent with the child. Instead of bland counting metrics, we can now see how these dimensions relate to key factors (i.e., the covariates included in this study) with an eye toward what outcomes each subscale predicts.

Given the multidimensional structure of the PIWIS, further discussion of the nuanced findings among the subscales is warranted. First, Positive Engagement and Indirect Care accounted for the most variance in the above mentioned models. The findings are congruent with our guiding theory of paternal involvement as both of those factors are primary domains in Pleck's (2010) conceptualization. Positive Engagement refers to such items as changing the infant's diaper, burping the infant, feeding the infant, and reading to the infant. Indeed, the infancy period is a developmental stage that requires a lot of parental attention and engagement. Most prior research has considered parental involvement with infants as the primary domain of mothers (Parke, 1996). Although mothers may assume a primary role in infant care, the mean PIWIS subscale scores found in our study indicate that fathers are also positively engaged. Such findings are congruent with other research (Fagan, 2014) that has found that fathers are involved with their infant—a finding often predicated upon the quality of coparenting and positive relationship dynamics between mother and father. Relatedly, Indirect Care makes sense within the relationship dynamics of the mother and father. As the mother may spend considerable time and effort caring for a newborn, our findings suggest that fathers can assume other tasks to remain involved such as arranging for childcare and taking the baby to medical appointments and childcare. Most measures of father involvement focus exclusively on direct engagement (e.g., Fagan & Palkovitz, 2011; Waller, 2012); our findings imply that fathers are also involved with their infants through indirect ways. Therefore, future studies that investigate paternal involvement with infants would benefit from using the PIWIS to capture both direct and indirect engagement.

The nuanced pattern of correlations among the five subscales requires explication. For example, unexpectedly, the Warmth & Attunement and Indirect Care subscales were significantly correlated in the negative direction. Similarly, there was a strong negative correlation between the Indirect Care and Frustration subscales. Those results shed some insight into the functionality of paternal involvement as a multidimensional construct. In other words, paternal involvement consists of multiple dimensions and fathers may exhibit those dimensions in various ways. In the context of the stated unexpected findings, fathers may experience a tradeoff in their involvement between direct interaction through play and their involvement in indirect, less

proximal care. Fathers may exhibit involvement in each domain, but not to the same degree. Another unanticipated finding was that the Frustration and Positive Engagement subscales were not significantly correlated. Although unanticipated, the finding indicates that fathers are not likely to become frustrated with increased "hands-on" work of childcare. That interpretation is situated within the "New Dad" model, which is reflective of changing sociodemographic trends in families and changing gender norms for some fathers in the United States and congruent with data that emphasize how fathers find meaning, satisfaction, and positive emotions in direct childcare roles (Chin, Hall, & Daiches, 2011; Genesoni & Tallandini, 2009; Harrington, 2010; Palkovitz, 2002). Yet other research (Bartlett, 2004) has found that the transition to fatherhood with an infant to be stressful for men, which underscores the need to continue to examine how direct involvement may impact the emotional experience of fathers during the infancy period.

Practical Implications

The PIWIS is a new instrument that can be utilized by family health promotion programs. The five subscales can be utilized by practitioners to understand specific aspects of paternal involvement. The utilization of this tool can indicate both a father's areas of strength as well as to identify any possible points of intervention. Recent efforts have been made to include fathers in parenting programs as a result of the evidence indicating that fathers have an impact on child development (Bronte-Tinkew, Burkhauser, & Metz, 2012). The PIWIS can be utilized in these programs as an assessment of paternal involvement within the overall assessment of family functioning with parents of infants.

The PIWIS can further assist mental health practitioners in identifying fathers that may be in need of therapeutic intervention. For example, a significant score on the Frustration subscale may indicate that a father is experiencing stress related to his paternal involvement and may benefit from intervention around this difficulty. Frustration during infancy can be associated with depression and decreased paternal involvement (Giallo, Cooklin, Wade, D'Esposito, & Nicholson, 2014). Attention to father mental health during the first year of parenting has been steadily increasing in the literature with attention given to paternal postpartum depression (Giallo et al., 2012; Gressier, Tabat-Bouher, Cazas, & Hardy, 2015; Musser, Ahmed, Foli, & Coddington, 2013). Fathers often do not seek mental health services, as evidenced in a study of help-seeking in a diverse group of fathers, which found that only 3.2% of fathers sought help for mental health concerns (Isacco, Hofscher, & Molloy, 2016). Thus, the PIWIS may be a useful instrument to assess frustrations experienced when parenting an infant.

Limitations

The generalizability of the PIWIS is most appropriate to residential, middle-class fathers living with the infant and their partner. That being said, some limitations emerged with sampling techniques and generalizability to other subgroups of fathers. The participants participated in this study via online report, which limits the study participants to those with Internet access and may be biased by self-report and social desirability. Future research may include face-to-face interviews or mailed surveys to ensure inclusion of those without Internet access. Additionally, the fathers in this study all resided with their infant and the infant's other parent. Residency status is known as a key contextual variable that impacts father involvement and associated child outcomes (Carlson, 2006; Goldberg, 2015); future investigation of the PIWIS instrument with nonresidential fathers is needed to examine the psychometric evidence and factor structure with this subgroup. Similarly, other contextual factors (e.g., geographic location, marital status) and cultural identities (e.g., race/ethnicity, religion, and spirituality) could result in unique differences in the subscale scores, with correspondingly varied implications for practitioners and policymakers. Therefore, future research that conducts cross-cultural validity studies of the PIWIS instrument with diverse subsample of fathers are needed. Finally, we obtained a smaller sample for our test–retest reliability analysis, which limits longitudinal conclusions about the reliability of the instrument. Future research with the PIWIS would benefit from continued investigation of the changing developmental needs of the infant as well as mother and father characteristics over time, which may impact the psychometric properties of the instrument (Planalp & Braungart-Rieker, 2015; Planalp, Braungart-Rieker, Lickenbrock, & Zentall, 2013).

Conclusions and Future Directions

Paternal involvement with infants has been found to influence child development in many domains including cognitive, physical, and social-emotional (Bronte-Tinkew, Carrano, Horowitz, & Kinukawa, 2008; Lamb, 2010; Parfitt, Pike, & Ayers, 2014; Shannon, Tamis-LeMonda, London, & Cabrera, 2002). Fathers can provide a unique contribution to infant development (Yogman et al., 2016). Father's interactions with infants has been found to provide children with experiences that encourage exploration as well as the development of social and self-regulation skills above that which mothers provide (Downer & Mendez, 2005; Fletcher, St. George, & Freeman, 2013; Pellis & Pellis, 2007). Moreover, paternal involvement during infancy can predict later father and child interactions. Negative and disengaged interactions between father and infant at 3 months of age have been found to predict externalizing problems when the child is 1 year old (Ramchandani et al., 2013). This literature underscores the importance of understanding and assessing paternal involvement with infants. The results of this study provide initial support for the reliability and validity of the PIWIS subscale scores, which can be used to measure dimensions of self-reported paternal involvement with infants. The PIWIS extends current understandings of paternal involvement based on the reconceptualization of paternal involvement (Pleck, 2010). The PIWIS targets a critical developmental period in child development and parenting through the focus on fathering infants. The PIWIS could be a useful tool for both professionals who work with infants and parents as well as researchers. Finally, given the complex interrelationships found among subscale scores as well as the covariates included in this study, future research in father involvement could focus on developing psychosocial models that give a finer-grained understanding of the transition to fatherhood (Singley & Edwards, 2015).

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Appendix

Paternal Involvement With Infants Scale—35

Paternal Involvement With Infant Scale (PIWIS)

Name: _____ **Date:** _____

Instructions

Please rate the frequency with which you engage in or experience the following aspects of parenting. Lower numbers reflect a relatively lower amount of times you engage in the activity.

Not At All 1	Rarely 2	Once or Twice A Month 3	A Few Times A Month 4	A Few Times A Week 5	About Once A Day 6	More Than Once A Day 7

	Response
1. Talking to your baby	1 2 3 4 5 6 7
2. Hugging your baby	1 2 3 4 5 6 7
3. Feeling that your involvement with your baby is important	1 2 3 4 5 6 7
4. Missing your baby when you are not with her/him	1 2 3 4 5 6 7
5. Soothing your baby when s/he is crying	1 2 3 4 5 6 7
6. Interactive playing with your baby (e.g., using stuffed animals or other toys)	1 2 3 4 5 6 7
7. Kissing your baby	1 2 3 4 5 6 7
8. Responding to your baby's facial expressions so that s/he can see your response	1 2 3 4 5 6 7
9. Feeling close to your baby	1 2 3 4 5 6 7
10. Laughing with your baby	1 2 3 4 5 6 7
11. Smiling at your baby	1 2 3 4 5 6 7
12. Choosing play activities for your baby	1 2 3 4 5 6 7
13. Determining when to feed your baby	1 2 3 4 5 6 7
14. Determining what media (TV, DVD's, music) is appropriate for your baby	1 2 3 4 5 6 7
15. Setting your baby's general schedule/activities	1 2 3 4 5 6 7
16. Knowing what foods (milk, formula, soft food) to give your baby and how much s/he eats	1 2 3 4 5 6 7
17. Determining which toys/play objects are appropriate for baby	1 2 3 4 5 6 7
18. Anticipating specific ways (monitoring health, availability of clothes, have proper amount/type of food, etc.) to assure that your baby's needs will be taken care of	1 2 3 4 5 6 7
19. Discuss the division of parenting responsibilities with your partner	1 2 3 4 5 6 7
20. Making decisions regarding your baby's well-being	1 2 3 4 5 6 7
21. Feeling jealous of your partner's connection with your baby	1 2 3 4 5 6 7
22. Giving your baby to your partner or other caregiver when your baby is crying	1 2 3 4 5 6 7
23. Feeling resentful of your baby due to increased responsibilities	1 2 3 4 5 6 7
24. Feeling frustrated when caring for your baby	1 2 3 4 5 6 7
25. Taking your baby to/picking up from child care	1 2 3 4 5 6 7
26. Taking your baby to medical appointments	1 2 3 4 5 6 7
27. Arranging for child care (e.g., babysitter, day care)	1 2 3 4 5 6 7
28. Bathing your baby	1 2 3 4 5 6 7
29. Changing your baby's diaper	1 2 3 4 5 6 7
30. Reading to/with your baby	1 2 3 4 5 6 7
31. Swaddling your baby	1 2 3 4 5 6 7
32. Burping your baby	1 2 3 4 5 6 7
33. Putting your baby down for nap/sleep	1 2 3 4 5 6 7
34. Waking up during the night to take care of your baby	1 2 3 4 5 6 7
35. Feeding your baby	1 2 3 4 5 6 7

(*Appendix continues*)

Scoring Instructions

The PIWIS instrument assesses five key aspects of fathers' involvement with their babies. Higher mean scores on each subscale reflects a higher level of involvement.

Warmth and Attunement Subscale – Items 1–11
Sum the item responses and divide by 11.

Control and Process Responsibility – Items 12–20
Sum the item responses and divide by 9.

Frustrations – Items 21–24
Reverse-score these items and divide by 4.

Indirect Care – Items 25–27
Sum the item responses and divide by 3.

Positive Engagement – Items 28–35
Sum the item responses and divide by 8.

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