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Parental self-efficacy for reducing the risk of adolescent depression and anxiety: Scale development and validation

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Abstract

Burgeoning research suggests that parents can reduce the risk of anxiety and depression in their adolescents, and that parental-self efficacy (PSE) may be related to parental risk and protective factors for these disorders. As there are currently no measures available to assess PSE in relation to parenting behaviors that may reduce adolescent risk for depression and anxiety, we developed and validated a measure of PSE, the Parental Self-Efficacy Scale (PSES). Using a sample of 359 parents and 332 adolescents (aged 12-15), the PSES was found to have high reliability, confirmatory factor analysis supported its validity, and most of the hypothesized relationships between the PSES and other measures of parenting practices and adolescent depressive and anxiety symptoms were supported.

Introduction

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Approximately half of the cases of mood and anxiety disorders across the lifespan begin by the age of 14 years, and three quarters by the age of 24 years (Kessler et al., 2005). The onset of mood and anxiety disorders during this critical period of development can result in deleterious consequences, such as impairing social, emotional, and functional development, as well as increasing the likelihood of school absences and suicide (Asselmann, Wittchen, Lieb, & Beesdo-Baum, 2018; Carballo et al., 2019; Lawrence et al., 2016). For parents, even if their children do not experience such disorders, the task of guiding their offspring from childhood to adolescence can be daunting, and the early adolescent developmental period marks a low point in parental confidence in their parenting abilities (Glatz & Buchanan, 2015a). Parents continue to play an important role in providing adolescents with the structure and support they require to flourish during a time of rapid neurological, physical, emotional, and social change (Patton et al., 2016). However, many parents feel ill-equipped to manage challenges in their relationship with their child, which are often driven by their adolescent's increasing need for autonomy (Steinberg, 2001). Burgeoning research indicates that the way parents manage such challenges can have an important role in the prevention of adolescent internalizing disorders (Yap, Pilkington, Ryan, & Jorm, 2014).

We define preventive parenting as parenting behaviors that can reduce risk factors and increase protective factors for adolescent depression and anxiety. Risk factors include parental over-involvement, defined as controlling behaviors that prevent age-appropriate autonomy and encourage emotional dependence, and aversiveness, defined as parental hostility towards their child thought to be reflective of a lack of acceptance (Yap et al., 2014). Protective factors include parental warmth, defined as expressed positive regard and pleasant interactions, monitoring, defined as parental awareness of their adolescent's whereabouts, friends, and activities, and age-appropriate autonomy granting, defined as encouragement of the adolescent contributing to decisions and developing opinions of their own (Yap et al., 2014). The enactment of preventive parenting behaviors requires parents to have confidence in their ability to carry them out effectively (Jones & Prinz, 2005).

Parental self-efficacy

Parental self-efficacy (PSE) is a component of general self-efficacy, outlined in Bandura's (1977) Social Cognitive Theory. The construct of self-efficacy is grounded in theories of human agency, whereby people take actions to influence their

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environments based on their level of confidence in their ability to perform these actions effectively (Bandura, 2006, 2008). That is, the more strongly people believe they have the capability to achieve a desired outcome, the more likely they are to take action. PSE is a product of the interaction between a parent's knowledge of the behaviors required to raise children effectively, their level of confidence in their ability to carry out these behaviors, and their belief that carrying out these behaviors will result in positive outcomes for their child (Bandura, 1997; Coleman & Karraker, 1998). According to self-efficacy theory, a parent's level of self-efficacy is likely to guide the amount of effort they invest in parenting, and the amount of time for which they sustain this effort. When faced with adversity, a parent with high PSE is more likely to persist until they are successful, thereby validating their high PSE, whereas a parent with low PSE is more likely to give up, thereby confirming their low PSE (Ardelt & Eccles, 2001).

PSE and parenting behaviors

The vast majority of research into the role of PSE in parenting behaviors and child outcomes has focused on infancy and childhood (Coleman & Karraker, 1998). Given that parenting behaviors can influence adolescent outcomes across various domains of functioning, including mental health (Hoskins, 2014), we need a better understanding of the role of PSE in this developmental period. The few studies that have addressed the relationship between PSE and parenting of adolescents have found that PSE plays a role in parents carrying out behaviors that are known risk and protective factors for adolescent depression and anxiety. During the adolescent developmental stage, correlational studies suggest that parents with higher PSE tend to exhibit higher levels of positive parenting practices such as warmth (de Haan, Prinzie, & Dekovic, 2009), age-appropriate limit setting and monitoring (Shumow & Lomax, 2002), and responsiveness, defined as parental acceptance of the adolescent and encouragement of autonomy (Gondoli & Silverberg, 1997). Further, a longitudinal study found PSE to be predictive of 'promotive parenting', operationalized as parental involvement in their teenager's life, warmth and positive interactions, and discussions about the consequences of actions during discipline (Glatz & Buchanan, 2015b). Such behaviors are consistent with factors that have been found to be protective against depression and anxiety in adolescents, including parental warmth, monitoring, and age-appropriate autonomy granting (Yap et al., 2014). Alternatively, low PSE has been associated with negative parenting practices

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such as inconsistent discipline strategies (Dumka, Stoerzinger, Jackson, & Roosa, 1996), as well as over-reactivity, defined as a tendency for parents to respond with anger to their adolescent (de Haan et al., 2009). These behaviors are consistent with parental over-involvement and aversiveness, which are evidence-based risk factors for adolescent depression and anxiety (Yap et al., 2014).

PSE and youth mental health outcomes

Despite past research establishing a link between PSE and preventive parenting, there is a dearth of research linking PSE to adolescent mental health outcomes. One study examined the relationship between PSE and adolescent depressive symptoms, comparing parents with PSE levels falling below the 25th percentile (low PSE) of the distribution in their study with parents above the 75th percentile (high PSE; Steca, Bassi, Capara, & Fave, 2011). Adolescents whose parents had high PSE reported lower levels of depressive symptoms than adolescents whose parents had low PSE. These differences were found in early adolescence, when the adolescent participants were approximately 13, and late adolescence, when participants were approximately 17.

As with much research in the area of PSE, other studies have focused on younger age groups. Children of parents with lower levels of PSE tend to have higher levels of depression, generalized anxiety, and separation anxiety (Aminayi, Chesli, Shairi, & Moharreri, 2015; Herren, In-Albon, & Schneider, 2013; Hill & Bush, 2001). Given the link between PSE and preventive parenting behaviors for adolescent depression and anxiety, and that adolescents whose parents have higher PSE levels have been found to have lower levels of depression (Steca et al., 2011), it is likely that the association between PSE and childhood anxiety and depression would continue into adolescence. However, further research is required to test this possibility.

The need for a new PSE measure

A key limitation noted in research addressing PSE is the lack of reliable and valid measures of PSE (Coleman & Karraker, 1998; Jones & Prinz, 2005; Sevigny, Loutzenhiser, & McAuslan, 2016). In Jones and Prinz's (2005) review, the authors categorize measures of PSE into three categories: general PSE; task-related PSE; and narrow-domain PSE. General PSE measures assess how parents feel about their competence as parents overall, rather than pertaining to specific tasks (e.g. Parenting Sense of Competence Scale; PSOC; Johnston & Mash, 1989). Task-related PSE measures assess a parent's levels of confidence in completing a variety of tasks,

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which then yield a summary of overall PSE (e.g. Ballenski & Cook, 1982). Narrow-domain measures determine a parent's level of confidence in carrying out a specific task, such as setting rules about their child's internet use (Internet-specific PSE; Glatz, Crowe, & Buchanan, 2018).

Task-related PSE measures are the most widely used (Jones & Prinz, 2005). The popularity of task-related measures follows from Bandura's (1989) conceptualization of self-efficacy; that it does not represent a generalized disposition, but rather that it can vary depending on the behavior the individual is attempting to carry out. Accurately assessing self-efficacy beliefs therefore requires examples of the specific tasks that contribute to the domain being measured (Bandura, 1997). The theoretical assumption that task-related measures have greater predictive validity than general measures has empirical support. One study found that a task-related measure of PSE better predicted improvements in disciplinary strategies than did a measure of general PSE (Sanders & Woolley, 2005). A randomized controlled trial (RCT) of an internet based parenting skills training intervention for managing conflict with adolescents included both a general measure of PSE and a task-related measure. The task-related measure was designed to assess confidence in carrying out parenting behaviors taught in the intervention (Cotter, Bacallao, Smokowski, & Robertson, 2013). They found larger effect sizes for improvement in PSE as measured by the task-related scale compared to the measure of general PSE (Cotter et al., 2013). This suggests that the task-related PSE scale captured a different latent construct to the general measure, and that PSE improved more in relation to carrying out the behaviours taught in their intervention than in relation to their role as a parent overall.

A recent systematic review of PSE measures identified no measures of PSE that had been developed specifically for parents of adolescents (Wittkowski, Garrett, Calam, & Weisberg, 2017). However, this review excluded narrow-domain measures. In our own review of the literature, we identified several measures that were developed for parents of adolescents. Two were narrow-domain measures, that measured PSE in relation to specific parenting behaviors associated with setting rules about alcohol (Glatz & Koning, 2016) and internet use (Glatz et al., 2018). Two others were task-related measures: one focused on PSE in relation to parenting strategies to manage oppositional behaviors taught in the intervention that the study was evaluating (Irvine, Gelatt, Hammond, & Seeley, 2015); the other examined PSE in relation to solving community problems and assisting their adolescent in avoiding

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peer-related problems such as alcohol and drug use (Shumow & Lomax, 2002). With increasing evidence that PSE is associated with preventive parenting of adolescents, there is an increased need for task-specific measures that capture PSE in relation to the evidence-based parenting risk and protective factors for internalizing disorders during this developmental period. Due to a lack of such measures, previous studies have tended to use general measures that are not of specific relevance to parenting adolescents (e.g. de Haan et al., 2009; Gondoli & Silverberg, 1997). One frequently used measure of general PSE is Dumka and colleagues' (1996) Parenting Self-Agency Measure (PSAM). The items in this measure are general enough to make it applicable across a number of developmental stages (e.g. "I feel secure about myself as a mother/father"). General measures are helpful when researchers wish to capture parents' overall sense of competence in their parenting role. However, task-specific measures allow researchers to better understand parents' level of confidence in carrying out specific behaviors that may differ depending on the developmental stage of their children.

Recognizing that parenting tasks differ across developmental stages, Ballenski and Cook (1982) created a measure of PSE that includes five subsections from infancy to adolescence. The 15 items in the adolescent subsection assess parental comfort in managing tasks such as "dealing with your child's moodiness", "helping your child to leave home", and "helping your child establish some direction in his/her life." The items were developed based on parenting books, primarily those by Duvall (1971) and Havighurst (1972).The adolescent subsection of this measure has been used in several recent studies (e.g. Glatz & Buchanan, 2015a; Glatz & Buchanan, 2015b), and is helpful in measuring PSE in relation to managing adolescent behaviors and helping adolescents to reach their developmental milestones. However, it does not include items assessing PSE in relation to parenting behaviors that recent research has suggested are important to preventing internalizing disorders in adolescents, such as parental warmth and involvement (Yap et al., 2014). It also includes items that do not have evidence for being relevant to preventive parenting, such as responding to sexual and financial pressures. As such, there is a need for a scale that captures PSE in relation to the full range of preventive parenting with items based on more recent research evidence.

Validation of PSE Measures

Studies of PSE commonly use measures created by the researcher for the

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purposes of their study, which often are minimally validated (Coleman & Karraker, 1998; Jones & Prinz, 2005). Most researchers select items based on a review of the literature, followed by evaluation by a panel of experts (e.g. Abidin, 1990; Ballenski & Cook, 1982; Dumka et al., 1996). A systematic review of measures of PSE found that of the 34 measures included, only 41.18% of studies used a factor analytic approach as part of their validation, and 20.59% reported no information on internal consistency (Wittkowski et al., 2017). Validation of the above-mentioned scale created by Ballenski and Cook (1982) was limited to establishing two-week test-retest reliability with a subsample of 23 mothers who participated in their study. It was unclear how many of these mothers completed the adolescent subsection of the measure. Of note, Glatz and Buchanan (2015b) later tested the factor structure of this measure using exploratory factor analysis (EFA), and using Cronbach's alphas, found that the reliability of the scale ranged from unacceptable to acceptable levels across the three time points at which they collected data.

Alternatively, Dumka and colleagues' (1996) PSAM was validated by conducting a confirmatory factor analysis (CFA) for a single factor solution, so as to establish whether the scale was measuring a single underlying factor of PSE. The authors then removed items with low factor scores, resulting in a 5-item scale with good internal structure. Internal consistency established through Cronbach's alpha was found to be acceptable. The researchers also conducted tests of measurement invariance, and found that the PSAM had the same internal structure across diverse groups (English speaking Anglo mothers compared to Mexican immigrant mothers). Further, they examined the relationship of their scale with other constructs that are related to PSE, including parenting practices. As these examples indicate, the approach used to validate measures pertaining to assess PSE has varied widely across studies in terms of its rigor.

Studies that have examined the relationship between PSE and preventive parenting and adolescent mental health outcomes have mostly used measures that are well validated. Some of these measures are general, rather than task-related measures of PSE (e.g. Aminayi et al., 2015; de Haan et al., 2009; Dumka et al., 1996; Gondoli & Silverberg, 1997; Herren et al., 2013; Hill & Bush, 2001). Others have used well-validated task-related measures of PSE that are relevant to specific parenting tasks such as the ability to influence the impact of peers on their adolescents and improve community resources (Shumow & Lomax, 2002), or influence their adolescent's free-

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time activities and school adjustment (Glatz & Buchanan, 2015a, 2015b). Taken together, while some scales exist that measure PSE in parents of adolescents, none assess the full range of parenting behaviors implicated in the development of adolescent internalizing disorders.

In sum, past research has shown that PSE is associated with preventive parenting of adolescents (e.g. de Haan et al., 2009; Glatz & Buchanan, 2015b; Gondoli & Silverberg, 1997; Shumow & Lomax, 2002) and youth depressive and anxiety symptoms (Aminayi et al., 2015; Herren et al., 2013; Hill & Bush, 2001; Steca et al., 2011). However, a lack of rigorously validated measures of PSE for tasks related to parenting adolescents has resulted in past research largely relying on general measures of PSE. To better understand the role of PSE as it relates to preventive parenting of adolescents, we need a task-specific measure of PSE in relation to the range of evidence-based parental risk and protective factors for adolescent depression and anxiety. Practitioners working with parents of adolescents may find a measure of confidence in carrying out preventive parenting behaviors relating to depression and anxiety more useful than general PSE measures, as it helps to identify particular areas to target for intervention and relapse prevention, rather than an indication of overall confidence in the parenting role. Rigorously validating the measure will allow future researchers and practitioners to administer the scale with confidence that it accurately captures a parent's PSE relating to preventive parenting.

Aims and hypotheses

The aim of this paper was to develop a measure of PSE specific to preventive parenting of adolescents, and to gather evidence for its reliability and validity. We used a sample of parents of 12 to15 year-olds to validate the newly developed Parental Self-Efficacy Scale (PSES). The reliability of the scale was assessed using McDonald's omega. In line with previous studies that have adopted a rigorous approach to validating measures of PSE, the validity of the PSES was assessed using CFA for a single factor solution. To assess the convergent validity of the PSES, the scale was correlated with previously validated measures of parenting behaviors. To assess the concurrent validity of the measure, the PSES was correlated with previously validated measures of youth depressive and anxiety symptoms. Based on the literature reviewed above, it was expected that the PSES would be positively correlated with measures of positive parenting practices, and negatively correlated

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with measures of negative parenting practices and adolescent depressive and anxiety symptoms.

Methods

Participants

Participants were parent-adolescent dyads who participated in an RCT of an online parenting program designed to teach parents evidence-based strategies for preventing depression and anxiety in adolescents. Ethical approval for the trial was obtained from the [information removed for blinded peer review] (approval no. [information removed for blinded peer review]). Recruitment primarily took place through schools, as well as through community and mental health organizations within Australia. Eligibility criteria required parent participants to be parents or primary caregivers of an adolescent aged 12 to 15 years, reside in Australia, be fluent in English, and have regular access to the Internet. One parent-adolescent dyad per family was permitted to register. Parent participation was not contingent on that of their adolescent. Baseline assessments were completed by 359 parents and 332 adolescents. The mean age of parent participants was 45.15 (SD = 5.20), and the mean age of adolescent participants was 13.64 (SD = 1.04). Parent participants were mostly mothers (87.1%), who were highly educated (58.2% reported completing graduate or post-graduate qualifications). Further, 15.9% of parent participants reported that they spoke a language other than English at home, which is lower than the national rates in Australia (22.2%; Australian Bureau of Statistics, 2016). Current or past mental health problems were reported by 59.8% of parents.

Procedures

Parent participants accessed explanatory statements and registered themselves and their adolescent via the trial website. A researcher then contacted the adolescent by telephone to invite them to take part in the study. Upon obtaining the adolescent's verbal assent to participate, the researcher assisted them to access and complete their baseline assessment via the trial website. If an adolescent did not wish to complete their assessment, a researcher skipped their assessment. Either the skipping or completion of the adolescent assessment triggered an automated email to the parent participant, to invite the parent to complete their baseline assessment via the trial website. We used baseline data from both parent and adolescent participants to validate the PSES. Further information about the intervention and findings from the follow-up assessment is available in Yap and colleagues (2018).

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Measures

Parental Self-Efficacy Scale (PSES). The PSES was developed to measure how confident a parent feels about their ability to carry out parenting behaviors with a robust evidence base for preventing adolescent depression and anxiety. Specifically, the PSES assesses a parent's level of confidence in carrying out behaviors outlined in a set of parenting guidelines, titled "How to Prevent Depression and Clinical Anxiety in Your Teenager: Strategies for Parents", henceforth the Parenting Guidelines (Parenting Strategies Program, 2013). The development of the Parenting Guidelines involved a systematic review of research examining parental risk and protective factors for adolescent depression and anxiety (Yap et al., 2014), followed by a Delphi study of international expert consensus to identify parenting strategies that reduce the risk of depression and anxiety in adolescents (Yap, Pilkington, Ryan, Kelly, & Jorm, 2015). As a task-related measure of PSE, the PSES covers nine domains of parenting outlined in the Parenting Guidelines, and is then summarized to provide a total score relating to PSE in carrying out parenting behaviors associated with preventing depression and anxiety in adolescents. Items were selected based on expert consensus of the developing authors. Items were answered on a 4-point Likert-type scale (not at all confident, a little confident, somewhat confident, very confident). The items were then summed to yield a total PSES score. The PSES was administered in conjunction with the Parenting to Reduce Adolescent Depression and Anxiety Scale (PRADAS; Cardamone-Breen, Jorm, Lawrence, Mackinnon, & Yap, 2017) which measures self-rated parenting behaviors based on the Parenting Guidelines. Table 1 presents the Parenting Guidelines subheading, corresponding section of the PRADAS, and the corresponding PSES item. Each of the nine PSES items was presented to participants following the section of the PRADAS that it was relevant to. This provided participants with task-specific examples of the behaviors they were rating their confidence in performing, which is thought to be helpful in yielding an accurate measure of self-efficacy beliefs (Bandura, 1997).

Parenting to Reduce Adolescent Depression and Anxiety Scale (PRADAS). The PRADAS is a criterion-referenced measure developed to assess a parent's level of concordance with behaviors recommended in the Parenting Guidelines (Cardamone-Breen et al., 2017). The scale consists of 73 items, each of which corresponds with a specific parenting recommendation in the Parenting Guidelines. The items address eight of the nine aforementioned domains of the

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Parenting Guidelines. During the process of validating the PRADAS, items in the domain "Your teenager's relationship with others" were removed due to poor psychometric properties. Parents complete the PRADAS items on a four-point Likert-type frequency scale for items assessing specific behaviors (never, rarely, sometimes, often), or a four-point Likert-type likelihood scale for items assessing hypothetical scenarios (very unlikely, unlikely, likely, very likely). As a criterion-referenced scale, each PRADAS item has pre-defined responses which were deemed as concordant (scored as 1) or non-concordant with the Parenting Guidelines (scored as 0). Scores from all 73 items were added to generate a total score, which represented overall concordance with the Parenting Guidelines. Test-retest reliability was acceptable for the PRADAS total score, and convergent validity was demonstrated via moderate correlations with two previously validated parenting measures (Cardamone-Breen et al., 2017). The agreement coefficient was used to determine reliability, as conventional internal consistency indices used for norm-referenced scales are deemed inappropriate for criterion-referenced tests (Subkoviak, 1988). The PRADAS total score was found to have high reliability in the PRADAS validation sample, which included participants in the current sample (Cardamone-Breen et al., 2017). The agreement coefficient was greater than .97 for the PRADAS total score in our sample, indicating high reliability.

Parenting to Reduce Adolescent Depression and Anxiety Scale, Adolescent Report (PRADAS-A). The PRADAS-A is a 43-item adolescent-report version of the aforementioned PRADAS (Cardamone-Breen, Jorm, Lawrence, Mackinnon, & Yap, Manuscript in preparation). Items assess adolescents' perceptions of their parents' performance of behaviors outlined in the Parenting Guidelines. During the validation process, the "Relationships with others" subscale was removed due to poor psychometric properties. As such, the PRADAS-A assesses the same eight subscales as the PRADAS. Response options were the same as the PRADAS, and items are scored as either concordant or non-concordant with the Parenting Guidelines. The scale has been shown to have excellent reliability with an agreement coefficient of .97, and good 3-month test-retest reliability (.81; Cardamone-Breen et al., Manuscript in preparation). The agreement coefficient was .97 in the current sample, indicating high reliability.

Inventory of Parent and Peer Attachment – Parent Report (IPPA-P). The 25-item IPPA-P (McElhaney, Porter, Thomson, & Allen, 2008; JP Allen, pers.

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comm., 2013) used in the present study was developed based on an adolescent-report measure of parent-child attachment (Armsden & Greenberg, 1987). The parent-report version mirrors the original adolescent-report version, with questions relating to the cognitive and affective components of the parent-adolescent relationship across three dimensions: mutual trust, quality of communication, and alienation in relationships. We calculated scores for each of these three dimensions, as well as a total score. Items were scored on a 5-point Likert scale (never true, seldom true, sometimes true, often true, almost always true). All items from the alienation subscale were reverse scored before computing the total score, such that higher scores reflect stronger parent-child attachment. Reliability was calculated using the omega coefficient, and was high for the total score (.93), as well as for trust (.89) and communication (.85), and was acceptable for the alienation subscale (.79).

Emotions as a Child Scale (EAC). The EAC (O'Neal & Magai, 2005) is a 45-item parent-report measure used to assess how parents socialize their children's negative emotions, namely anger, sadness, and fear. The inventory has five global subscales which represent strategies parents use to encourage or discourage their child's expression of these emotions. These are "reward" (support, empathize with, and assist the child), "punish" (show disapproval or criticism towards the child), "override" (distraction or minimizing the emotion), "neglect" (ignore the emotional expression), and "magnify" (responding with unhelpfully strong emotions). We calculated the five global subscales, as well as the 15 emotion-specific subscales that relate to the strategies parents use in each emotional context (e.g., punishment of sadness). The EAC has shown good internal consistency and acceptable one-week test-retest reliability (O'Neal & Magai, 2005). We used the global subscales, as they demonstrated higher reliability in our sample than the emotion-specific subscales (omegas: reward = .91, punish = .89, neglect = .85, override =.91, magnify = .87).

Short Mood and Feelings Questionnaire (SMFQ). The SMFQ is a 13-item version of the Mood and Feelings Questionnaire (Angold et al., 1995). Both parent (SMFQ-P) and child (SMFQ-C) versions have been widely used to assess depressive symptoms in children aged 6 to17 years, including in community samples (e.g. Thapar & McGuffin, 1998). Items relate to depressive symptoms experienced (SMFQ-C) or observed (SMFQ-P) in the last two weeks, and are rated on a three-point scale (not true, sometimes true, or true). Reliability was high in the present

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sample for both adolescents and parents (SMFQ-C: omega = .93; SMFQ-P: omega = .93).

Spence Children's Anxiety Scale (SCAS). The SCAS is used to assess anxiety symptoms in children and adolescents through a 45-item child-report (SCAS-C; Spence, 1997) and a 39-item parent-report measure (SCAS-P; Spence, 1999). It assesses six domains of anxiety (separation anxiety, social phobia, obsessive-compulsive disorder, panic/agoraphobia, generalized anxiety, and fear of physical injury), the scores from which contribute to a total anxiety score. The frequency of anxiety symptoms is scored on a 4-point scale (never, rarely, sometimes, or always). The total anxiety score has shown high internal consistency and adequate test-retest reliability, and has been normed in a sample of Australian school children (Spence, 1997, 1998; Spence, Barrett, & Turner, 2003). Reliability was high in the present sample for both adolescents and parents(SCAS-C: omega = .95; SCAS-P: omega = .93).

Statistical methods

Reliability. Reliability was calculated using McDonald's omega (McDonald, 1970, 1999), as it is a less biased reliability index than Cronbach's alpha (Dunn, Baguley, & Brunsden, 2014). This is of particular pertinence for calculating the reliability of scales where items may differ on how strongly they relate to the underlying construct being measured, as omega does not carry the assumption that factor loadings are equal (McNeish, 2018). Omega for the PSES was calculated using package R (R Development Core Team, 2014).

Construct Validity. To assess the construct validity of the PSES, we conducted a CFA to determine the extent to which the nine items converged to reflect a single, homogenous dimension. The CFA analyses were conducted using Mplus version 7.4 (Muthén & Muthén, 1998-2012). Model fit was interpreted based on the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker-Lewis Fit Index (TLFI). The RMSEA takes into account degrees of freedom and provides an indication of the goodness of fit of the model when compared to a hypothesized model, with fit indices < .08 suggesting an acceptable model fit (Browne & Cudeck, 1993). Hu and Bentler (1999) suggest that CFI and TLFI should both be > .95 to suggest a good model fit.

Convergent validity. To assess convergent validity, bivariate Pearson correlations between total scores on the PSES and scores on measures of preventive

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parenting (PRADAS and PRADAS-A), and the parent report of parent-adolescent attachment (IPPA-P) and parental socialization of their adolescent's emotions (EAC Scale) were examined.

Concurrent validity. To assess concurrent validity, bivariate Pearson correlations between total scores on the PSES and scores on the parent and adolescent reports of adolescent depressive symptoms (SMFQ-P/C), and anxiety symptoms (SCAS-P/C) were examined.

Results

Missing data and distributional assumptions. A web programming error resulted in data collected for PSES item 8 not being stored, despite parents entering an answer to this question. This error was detected and amended partway through data collection. Missing values analysis revealed that 59.6% of data for item eight was missing. Full information maximum likelihood (FIML) is considered the least biased method of handling missing data of this proportion (Dong & Peng, 2013), and was used for all analyses. There was no further missing data for parents on other measures. Less than 5% of adolescent participants had missing data on the PRADAS-A, SCAS-C, and SMFQ-C. FIML was also used to handle this data.

PSES descriptive statistics. Table 2 displays the means, standard deviations, and correlations between PSES items and the PSES total score. The average score for each item on the PSES corresponded with parents being between *'a little confident'* and '*somewhat confident'* in their ability to carry out the behaviors they were being asked about. Eyeball observations suggested that parents reported the highest level of confidence in their ability to build a strong relationship with their adolescent, encourage good health habits, and seek professional help for their adolescent when needed.

Reliability. Reliability for the total PSES score in our sample was deemed high (McDonald's omega = .91).

Construct validity. The first way we tested validity was through assessing construct validity by conducting a CFA for a single-factor solution, using the full sample (N=359) with missing item-8 data replaced. In Model 1, all items loaded significantly on a single factor ($p < .01$), with loadings > .50. However, the model did not have acceptable fit (RMSEA = 0.09 [90% CI: 0.07 – 0.11]; p = 0.00; CFI = 0.97; TLI = 0.96). Modification indices suggested that the model could be improved by allowing for the correlation of residuals between items 7 ("How confident do you feel

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about your ability to support your teenager when they face problems in their life?") and 8 ("How confident do you feel about your ability to help your teenager cope with anxiety?"), and items 8 and 9 ("If you noticed a persistent change in your teenager's mood or behavior, how confident do you feel about your ability to help your teenager seek appropriate professional help?"). When item residuals can be correlated, this suggests that they are measuring the same concept, and one item can be removed (Brown, 2006). As the error for item 8 was correlated with both item 7 and item 9, we removed item 8. A CFA for a single-factor solution was then conducted for the 8-item version of the PSES. All items loaded significantly onto a single factor ($p < .01$), with loadings >.40. The model had acceptable fit (RMSEA = 0.07 [90% CI: 0.05 – 0.10]; p = 0.03; CFI = 0.98; TLI = 0.98).

Given the large proportion of missing data on the PSES item 8, we re-ran the CFA for a single factor solution using data from the 40.4% of participants (n=143) whose answers were stored for item 8. As with the full sample, the 9-item version of the PSES had poor fit (RMSEA = 0.09 [90% CI: 0.07 – 0.11]; p = 0.00; CFI = 0.97; TLI = 0.96). Modification indices suggested that residuals between items 7 and 8, and items 8 and 9 could be correlated. Once again, removing item 8 improved the fit of the model (RMSEA = 0.07 [90% CI: 0.05 – 0.10]; p = 0.04; CFI = 0.99; TLI = 0.98), and all items loaded significantly onto a single factor ($p < .01$), with loadings >.50. Factor loadings for the 8-item PSES for the entire sample, as well as the sub-sample with complete data, are displayed in Figure 1. Taken together, these findings support our hypothesis that items from the PSES are measuring a single underlying factor: PSE for preventive parenting.

Convergent validity. To assess the convergent validity of the PSES we conducted bivariate correlations between parents' total score on the PSES and previously validated measures of parenting. We examined associations between the total scores on the parent and adolescent report versions preventive parenting (measured by the PRADAS and PRADAS-A). The preventive parenting behaviors measured in these scales included parental warmth, aversiveness, involvement, age-appropriate autonomy granting, consistent discipline, problem solving, anxiety management and professional help seeking. As displayed in Table 3, there were significant moderate positive correlations between PSES total scores and total scores on the measure of preventive parenting behaviors reported by parents (PRADAS). Higher PSES scores were associated with higher scores on this measure of preventive

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parenting, hence higher concordance with the Parenting Guidelines. There were small but significant positive correlations between the PSES and the adolescent report of preventive parenting; as predicted, higher scores on the PSES were associated with higher scores on the PRADAS-A.

We also examined correlations between the PSES and attachment in the parent-adolescent relationship across three dimensions: mutual trust, quality of communication, and alienation in relationships (measured by the IPPA-P). We found moderate significant positive correlations between the PSES and the trust and communication subscales, as well as a moderate significant inverse relationship between the PSES and the alienation subscale. There was a small but significant positive correlation between the PSES and the total score for this measure, with higher PSES scores being associated with greater parent-adolescent attachment.

The final parenting measure we used to examine convergent validity was a measure of the strategies that parents use to encourage or discourage their child's expression of emotions (EAC Scale). We found a small but significant positive correlation between the PSES and the reward subscale, which measures the extent to which parents support and empathize with their child's expression of emotions. We found small but significant negative correlations between the PSES and the punish subscale (measures parental disapproval or criticism of the child), neglect (ignoring the child's emotion), and magnify subscale (responding with unhelpfully strong emotions) of the EAC. The association between the PSES and the override subscale (distracting or minimizing the child's emotion) was not significant.

Concurrent validity. To assess concurrent validity, we conducted bivariate correlations between parent and adolescent reports of adolescent depressive (SMFQ-P/C) and anxiety symptoms (SCAS-P/C). There were small but significant negative correlations between parental reports of adolescent depressive and anxiety symptoms. Higher scores on the PSES were associated with lower adolescent depressive and anxiety symptoms as reported by parents. The correlations between the PSES and adolescent report of their own depressive or anxiety symptoms were not significant.

Discussion

In this study, we developed and validated a measure of PSE related to parenting behaviors that may reduce the risk of adolescent depression and anxiety. Results of a confirmatory factor analysis revealed the PSES had good internal structure, and a high omega coefficient supported its reliability. Correlations between

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the PSES and previously validated measures of parenting provided support for the convergent validity of the measure, as hypothesized relationships based on past literature were largely confirmed.

Construct validity

The final PSES contains 8 of the 9 items originally developed to assess PSE in relation to preventive parenting. The concept underlying the question ("How confident do you feel about your ability to help your teenager cope with anxiety?") appears to have been captured by two other questions in the scale ("How confident do you feel about your ability to support your teenager when they face problems in their life?" and "If you noticed a persistent change in your teenager's mood or behavior, how confident do you feel about your ability to help your teenager seek appropriate professional help?"). Helping their adolescent cope with anxiety seems to have been interpreted by parents as a combination of helping them deal with problems, and seek professional help when needed. The removal of the item on coping with anxiety resulted in a single factor solution with good internal structure. All items in the final model loaded significantly onto one factor, suggesting that they were measuring the same underlying construct: PSE. The scale was found to be highly reliable in the current sample.

The factor structure of PSE scales in previous research tends to vary depending on the design of the scale. For example, like the PSES, the commonly-used Parenting Sense of Agency Measure created by Dumka and colleagues (1996) was designed to measure only the latent construct of PSE. CFA revealed items cohered as a single underlying factor. Elsewhere, scales of PSE have been designed to simultaneously measure multiple constructs. The Parenting Sense of Competence Scale created by Johnston and Mash (1989) measures two latent constructs: parenting stress and PSE. Multiple factor analytic studies have supported the two-factor structure of this scale (Bui et al., 2017; Johnston & Mash, 1989; Ohan, Leung, & Johnston, 2000). Our scale was designed as a brief task-related scale, with each item capturing confidence in carrying out a different set of parenting behaviors (e.g. minimizing conflict in the home versus encouraging good health habits). The behaviors being measured were independent of one another, and were not intended to form multiple subscales. As such, the coherence of the items as a single underlying dimension supports the construct validity of the PSES in measuring PSE.

Convergent validity

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As expected, positive correlations were found between the PSES and preventive parenting behaviors as reported by parents (PRADAS), as well as small but significant correlations between the PSES and preventive parenting reported by adolescents (PRADAS-A). This is consistent with previous research that has found links between PSE and the various parenting behaviors measured in these scales of preventive parenting, including parental warmth and responsiveness (de Haan et al., 2009; Glatz & Buchanan, 2015b; Gondoli & Silverberg, 1997; Izzo, Weiss, Shanahan, & Rodriguez-Brown, 2000) limit setting and monitoring (Shumow & Lomax, 2002), age appropriate autonomy granting (de Haan et al., 2009; Shumow & Lomax, 2002), inconsistent discipline (Dumka, Gonzales, Wheeler, & Millsap, 2010), and discussion about the consequences of the adolescent's actions during discipline (Glatz & Buchanan, 2015b). The PRADAS and PRADAS-A assess each of these preventive parenting behaviors in a single scale. The correlations between the PSES and the PRADAS and PRADAS-A lend support to the convergent validity of the PSES, as this replicates and extends findings of previous studies that have used different measures of PSE and parenting.

The IPPA-P assesses parent-adolescent attachment through questions about trust, communication, and alienation. Moderate associations were found between the PSES and each of these subscales, suggesting higher levels of trust and communication, and lower levels of alienation, were associated with higher PSE. While this finding is intuitive, to our knowledge, the relationship between PSE and parent-adolescent attachment has not been examined in previous research. However, PSE in parents of one-month-old babies assessed using a task-specific measure of competence in parenting infants has been found to be predictive of attachment security at 24 months (Nievar, 2004). Our finding suggests that the relationship between PSE and attachment continues into the adolescent period, and that higher levels of PSE are related to the higher levels of trust and communication and lower levels of alienation, which characterize a secure parent-adolescent attachment (Armsden & Greenberg, 1987). Further research is required to discern the direction of the relationship between PSE and attachment. That is, whether parents of securely attached children are more likely to perceive themselves as efficacious, whether parents who are high in PSE are more likely to raise securely attached children, or whether this relationship is bi-directional.

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The EAC assesses parental socialization of their child's expressions of negative emotions (sadness, anger, and fear). The reward subscale of this measure assesses the degree to which parents encourage and support their adolescents' expression of emotions. This subscale had a moderate positive association with the PSES, similar to findings of previous studies that have found warmth and responsiveness to be related to PSE (de Haan et al., 2009; Gondoli & Silverberg, 1997; Izzo et al., 2000). This suggests that parents who scored higher on the PSES tended to respond to their adolescent's emotions by comforting them, showing empathy, and assisting them in solving the problem. The other EAC subscales (punish, neglect, magnify, and override) assess negative parental socialization of adolescents' expression of emotions. To our knowledge, previous research has not examined the relationship between PSE and negative parental responses to adolescents' emotions. We found that parents with lower PSE are more likely to respond to their adolescent's expression of emotion through unhelpful strategies such as showing disapproval, ignoring, or exaggerating the adolescent's emotional experience. Practitioners designing interventions for parents with low PSE may benefit from addressing such responses to adolescent emotions. However, PSE was not significantly related to minimizing adolescent negative emotions, by using strategies such as telling the adolescent to cheer up or not to worry about a problem. Our finding suggests that parents use this strategy regardless of their level of PSE. Many parents may not be aware of the potential negative impact of using such strategies. This suggests that regardless of PSE levels, parents may require education regarding the importance of validating rather than minimizing their adolescent's emotions.

Taken together, the above findings largely support the convergent validity of the PSES, as most of the hypothesized relationships were confirmed. Previous research has established a relationship between PSE and a broad range of parenting practices that support and encourage optimal emotional development in children (Coleman & Karraker, 1998; Jones & Prinz, 2005). These findings strengthen those of previous correlational studies by demonstrating these relationships continue into adolescence, and exist when measured with a task-specific rather than general scale of PSE.

Concurrent validity

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To examine the concurrent validity of the scale, we looked at correlations between the PSES and measures of adolescent depression and anxiety symptoms. Small but significant correlations were found between the PSES and parent reports of adolescent depressive and anxiety symptoms. While previous studies have not examined whether a relationship exists between PSE and parent reports of adolescent depressive and anxiety symptoms, this association has been found in younger age groups (Cote et al., 2009; Herren et al., 2013). Adolescent reports of depressive and anxiety symptoms were not correlated with PSE in the current study. Given that the correlations between the PSES and parent report of adolescent symptoms were already quite low, it is unsurprising that correlations between the PSES and adolescent reports of their own symptoms were not significant. Discrepancies between adolescent and parent reports are not uncommon in parenting research (Bögels & Melick, 2004; De Los Reyes & Ohannessian, 2016; Human, Dirks, DeLongis, & Chen, 2016). However, this is contrary to findings by Steca et al. (2011), who found that compared to adolescents whose parents had low PSE, adolescents whose parents had high PSE tended to report lower levels of depressive symptoms. The differences in findings may be attributed to the analytic technique used. Our sample included parents with a full range of PSE levels, whereas Steca et al. (2011) excluded parents whose PSE levels were moderate, resulting in a smaller sample. They conducted t-tests between groups of adolescents whose parents had high compared to low PSE, rather than examining correlations across the full range of PSE scores. Future research including parents with a full range of PSE scores in a clinical sample of adolescents is required to evaluate whether the PSES is associated with adolescent reports of their own symptoms.

Strengths and limitations

This study was not without limitations. Firstly, the nine items of the PSES were presented separately, following the section of the PRADAS that covered the topic each PSES item was addressing. Items in both the PSES and the PRADAS are task-related. It is generally accepted in PSE literature that providing task-specific items enhances the accuracy of the measure of self-efficacy beliefs (e.g. Bandura, 1997; Bandura, 1989; Coleman & Karraker, 1997). As such, participants were presented with more task-specific examples of the behaviors that they were rating their confidence in performing, than if the PSES were presented on its own. This would not present a problem for researchers who wish to administer the PRADAS in

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conjunction with the PSES. However, some researchers may not wish to administer the PRADAS. Further, the design of the larger study from which we drew the sample to validate the measure did not allow us to examine test-retest reliability of the measure, as parents either received an intervention or an active control before their follow-up assessment. Further research is required to establish the reliability and validity of the PSES when presented separately to the PRADAS, as well as the test-retest reliability of the measure.

A second limitation was that our sample largely consisted of English speaking, highly-educated, parents, most of whom were mothers. This limited our ability to conduct tests of measurement invariance to determine whether the same underlying construct was being measured in different groups. A lack of diversity in samples is a common issue in PSE research (Coleman & Karraker, 1997). Some studies have found low socio-economic position to undermine the development of PSE in parents of adolescents (e.g. Shumow & Lomax, 2002). However, more recently it was found that the differences in PSE levels among groups of differing socio-economic positions did not exist after controlling for characteristics such as adolescent externalizing symptoms and the quality of the adolescent-parent relationship (Glatz & Buchanan, 2015a). Nevertheless, research including a more diverse sample is required, particularly given that PSE has been shown to function differently in different cultural groups (Glatz & Buchanan, 2015a). Further, there have been calls for research to examine the role of parents' gender in PSE, due to findings suggesting that mothers' parenting behaviors may be more likely to be impacted by low PSE levels than fathers' parenting behaviors (Glatz & Buchanan, 2015b). An inadequate number of fathers and of parents who spoke a language other than English limited our ability to conduct tests of measurement invariance on these groups. Should future researchers wish to use this scale to compare diverse groups, tests of measurement invariance will need to be conducted to be able to conclude that their findings represent differences in PSE rather than in participants' interpretation of the measure.

Also regarding the representativeness of our sample, current or past mental health problems were reported by 59.8% of parents. A number of factors could explain this large proportion. Firstly, parents who have experienced mental health problems may have been more likely to be on the email databases of mental health organizations we targeted during recruitment. Further, parents who have experienced mental health problems themselves may be more interested in prevention programs

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for their children than those who had not. Based on the health belief model (Rosenstock, 1974), parents will be more likely to engage in a program if they believe their child is susceptible to a problem and they perceive a program to be severe.

Despite these limitations, this study made an important contribution to PSE and adolescent development literature by creating and validating a scale specifically for the task and developmental period being assessed. PSE is increasingly becoming recognized as both an important target and outcome for parenting interventions (for reviews see: Coleman & Karraker, 1998; Jones & Prinz, 2005). The PSES is the first measure that assesses PSE in relation to the wide range of evidence-based parenting factors for the development of depression and anxiety in adolescents. The PSES offers future researchers and practitioners the option of using a task-related measure of PSE in relation to preventive parenting. In the broader literature on self-efficacy, task-related measures have been shown to be better able to predict performance of behaviors than general measures of self-efficacy (Coleman & Karraker, 1998). In this way, the PSES provides future researchers focusing on PSE in the context of adolescent mental health with a tool that is more likely than general measures of PSE to capture a parent's level of confidence in carrying out behaviors that are linked to adolescent depression and anxiety. Practitioners working with parents of adolescents may also find the PSES more useful than general PSE measures, as it tests PSE in relation to preventive parenting rather than their confidence in their role as a parent overall. As such, the PSES can highlight particular areas to target for intervention.

Conclusions

This paper discussed the development and validation of the Parental Self-Efficacy Scale (PSES). The results lend support to the reliability and validity of the PSES. Despite some differences between parent and adolescent reports, the associations between PSES and previously validated measures of parenting and adolescent depression and anxiety symptoms lend support to the convergent validity of the measure. Given the evidence that PSE continues to play an important role in parenting behaviors during the adolescent developmental period, the PSES may prove to be a useful tool in future research and child and family therapeutic interventions.

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Table 1

Guidelines topics, corresponding sections of the PRADAS, and corresponding PSES survey item.

Guidelines subheading	Corresponding PRADAS subscale	PSES survey item
Establish and maintain a good relationship with your teenager	Your relationship with your teenager	How confident do you feel about your ability to build and maintain a close relationship with your teenager?
Be involved and support increasing autonomy	Your involvement in your teenager's life	How confident do you feel about your ability to find a balance between being involved in your teenager's life and encouraging age-appropriate independence?

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Encourage supportive relationships	Your teenager's relationships with others	How confident do you feel about your ability to help your teenager to build their social skills?
Establish family rules and consequences	Your family rules	How confident do you feel about your ability to establish family rules and consequences?
Minimize conflict in the home	Your home environment	How confident do you feel about your ability to solve conflicts with your teenager in a constructive manner?
Encourage good health habits	Health habits	How confident do you feel about your ability to influence your teenager to make healthy lifestyle choices?
Help your teenager to deal with problems	Dealing with problems in your teenager's life	How confident do you feel about your ability to support your teenager when they face problems in their life?
Help your teenager to deal with anxiety	Coping with anxiety	How confident do you feel about your ability to help your teenager cope with anxiety?
Encourage professional help seeking when needed	Getting help when needed	If you noticed a persistent change in your teenager's mood or behavior, how confident do you feel about your ability to help your teenager seek appropriate professional help?

Table 2

Correlations, means, standard deviations, and total score for PSES items

Item	1	2	3	4	5	6	7	8	9
1. Relationship	-								
2. Involvement	.55	-							
3. Social skills	.48	.52	-						
4. Family rules	.38	.45	.42	-					

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5. Conflicts	.48	.53	.46	.52	-				
6. Health habits	.46	.41	.44	.47	.42	-			
7. Problem solving	.52	.47	.54	.42	.53	.48	-		
8. Help seeking	.32	.32	.30	.33	.25	.21	.43	-	
9. Total score	.74	.74	.74	.71	.74	.68	.77	.56	-
M	3.21	2.96	2.79	2.80	2.73	3.20	2.82	3.22	23.80
SD	.81	.74	.85	.83	.81	.78	.79	.85	4.58

Note. all correlations were significant at $p < .01$.

Table 3

Correlations between PSES Total Scores and PRADAS, PRADAS-A, SMFQ, SCAS, IPPA-P, EAC.

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Scale	N	Pearson's correlation with PSES Total Score
Parent report measures		
PRADAS	359	.63*
IPPA-P total score	359	.37*
IPPA-P trust subscale	359	.51*
IPPA-P communication subscale	359	.57*
IPPA-P alienation subscale	359	-.50*
EAC reward global subscale	359	.43*
EAC punish global subscale	359	-.30*
EAC neglect global subscale	359	-.38*
EAC override global subscale	359	-.10
EAC magnify global subscale	359	-.33*
SMFQ-P	359	-.31*
SCAS-P	359	-.19*
Adolescent report measures		
PRADAS-A	332	.21*
SMFQ-C	332	-.10
SCAS-C	332	-.03

Note. PSES = Parental Self-Efficacy Scale, PRADAS = Parenting to Reduce Adolescent Depression and Anxiety Scale, IPPA-P = Inventory of Parent and Peer Attachment – Parent Report, EAC = Emotions as a Child Scale, SMFQ-P = Short Mood and Feelings Questionnaire, parent-report, SCAS-P = Spence Children's Anxiety Scale, parent-report, PRADAS-A = Parenting to Reduce Adolescent Depression and Anxiety Scale, Adolescent Report, SMFQ-C = Short Mood and Feelings Questionnaire, child-report, SCAS-C = Spence Children's Anxiety Scale, child-report.

*p< .01

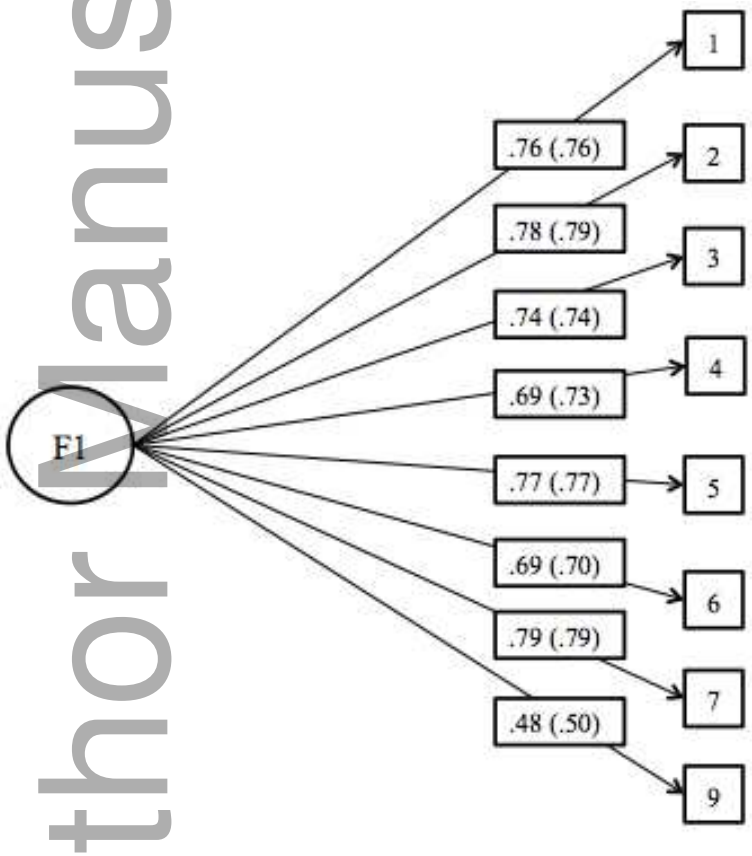
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Figure Caption

Figure 1. Factor loadings for CFA of the 8-item PSES for the entire sample (n = 359) and subsample with complete data (n = 143). Factor loadings for entire sample are displayed first; factor loadings for sub-sample with complete data are displayed in parentheses.



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