



Published in final edited form as:

Res Child Adolesc Psychopathol. 2022 November ; 50(11): 1445–1455. doi:10.1007/s10802-022-00941-1.

Agreement, Stability, and Validity of Parent- and Youth-Reported Anxiety Symptoms from Childhood to Adolescence

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Abstract

The current study examined changes in the agreement, stability, and concurrent and predictive validity of parent- and self-reports on a frequently used measure of youth anxiety symptoms, the Screen for Child Anxiety Related Emotional Disorders (SCARED), from age 9 to 15.

A community sample of 531 families (youth, mothers, and fathers) completed the SCARED and a semi-structured diagnostic interview when children were ages 9, 12, and 15. Agreement between youth and each parent on youth anxiety symptoms was weak at age 9 ($r = .12-.17$),

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All procedures in the current study were approved by the Stony Brook University Institutional Review Board.

Authors' Contributions: Sarah Hyland, Daniel M. Mackin, and Daniel N. Klein contributed to the study conception and design. Material preparation and data analysis were performed by Sarah Hyland and Daniel M. Mackin and overseen by Daniel N. Klein. Data collection and scoring was performed by Daniel M. Mackin, Brandon L. Goldstein, and Megan C. Finsaas. The first draft of the manuscript was drafted by Sarah Hyland, Daniel M. Mackin, and Daniel N. Klein. Substantial revisions to the original manuscript were provided by Brandon L. Goldstein and Megan C. Finsaas. Daniel M. Mackin oversaw manuscript revisions and responses to reviewers, with assistance from Sarah Hyland and Daniel N. Klein.

Disclosure Statement:

The authors have no conflicts of interest to report.

Declarations

Conflicts of Interest: The authors have no conflicts of interest to report.

Availability of Data and Material: Not applicable

Code Availability: Not applicable

Ethics Approval: All procedures in the current study were approved by the Stony Brook University Institutional Review Board. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Consent to Participate: All adult participants provided informed consent for their and their child's participation. All youth participants provided informed assent for their participation.

Consent to Publish: All adult and child participants provided informed consent and assent, respectively, for their data to be used in publications.

but moderate at age 12 ($r = .31-.36$) and 15 ($r = .31-.46$); mother-father ($r = .50-.53$) agreement was greater than youth-parent agreement at every wave. Stability of youth-reported symptoms was low between age 9 and 12 ($r = .25$), but much higher from age 12 to 15 ($r = .57$); mother- and father-reported youth anxiety symptoms demonstrated high stability ($r = .53-.74$) at both intervals. Self- and parent-reported youth symptoms were both significantly associated with youth anxiety disorder status, cross-sectionally and prospectively. When considered simultaneously at age 9, only parent-reported anxiety symptoms uniquely predicted concurrent and subsequent youth anxiety diagnoses. However, by age 12, parent- and youth-reported anxiety symptoms were each independently associated with concurrent and subsequent anxiety diagnoses. Agreement, stability, and concurrent and predictive validity of youth self-reported anxiety symptoms are poorer than parent-reports in middle childhood, but comparable by middle adolescence. However, all reporters provide unique information about youth anxiety at each of the developmental periods examined.

Keywords

Anxiety; youth; stability; agreement; validity

Anxiety disorders frequently manifest in childhood (Essau et al., 2018) and are among the most common disorders in children and adolescents (Ghandour et al., 2019; Merikangas et al., 2010). Youth anxiety disorders are associated with high rates of comorbidity and impairment in multiple domains, including poor academic performance and difficulties initiating and maintaining peer relationships (Langley et al., 2014). Additionally, youth anxiety disorders often persist into adulthood, contributing to significant lifelong impairment (Strawn et al., 2020).

The assessment of anxiety disorders in youth frequently relies upon multiple reporters (Wei et al., 2013). Prior research indicates that discrepancies between reporters are common (De Los Reyes, Alfano & Beidel, 2009; Niditch & Varela, 2010), raising questions about the relative validity of different informants' reports of youth symptoms for research and clinical purposes. Importantly, the validity of informants' reports may vary as a function of development. Children may become better reporters as their cognitive capacities and insight mature, while parents may have less contact with and know less about their children as the youth become more independent and begin to separate and individuate.

Unfortunately, there is a paucity of longitudinal studies of the agreement, stability, and validity of parent- and self-reported symptoms of youth anxiety over the course of development from childhood to adolescence. Additionally, while prior research has highlighted the value of using multiple informants (Hughes & Gullone, 2010), fathers are historically underrepresented in research on youth (Parent, Forehand, Pomerantz, Peish, & Seehuus, 2017; Phares & Compas, 1992). Therefore, it is also important to examine the validity of father-reported youth symptoms. Direct comparisons of the agreement, stability, and validity of mother, father, and self-reports of youth anxiety symptoms over the course of development can provide important context for interpreting these data.

Agreement Between Reporters of Youth Anxiety Symptoms

In prior research, agreement between parents' and youths' reports of youth anxiety symptoms has been low (Hughes & Gullone, 2010; Niditch & Varela, 2010). However, cross-sectional investigations using the Behavior Assessment System (BASC-2) for Children, Revised Children's Manifest Anxiety Scale (RCMS), and Diagnostic Interview Schedule for Children-Predictive Scale (DISC-R) suggest that agreement increases over the course of development, reaching a moderate level by adolescence (Goolsby et al., 2018; Hughes & Gullone, 2010; Schwab-Stone et al., 1994). Unfortunately, due to the cross-sectional nature of prior investigations, it is not possible to draw firm conclusions regarding the magnitude of this change and at what age it occurs. Additionally, while the majority of studies have focused on either mother-reported or aggregate parent-reported youth anxiety symptoms, the few studies examining parents separately suggest that there is greater concordance between mothers and fathers than between parents and children with regards to reports of youth anxiety symptoms, and that agreement between mothers and youth tends to be greater than between fathers and youth, at least when examined with the Screen for Child Anxiety Related Emotional Disorders (SCARED; Jansen et al., 2017).

Stability of Parent- and Youth-Reported Anxiety Symptoms

Few longitudinal studies have examined the longer-term stability of self- and parent-reported anxiety symptoms. However, there appears to be a high level of stability of youth-reported anxiety symptoms during late childhood and adolescence when examined at an interval of 12 months via the Multidimensional Anxiety Scale for Children (MASC) and the SCARED (Baldwin & Dadds, 2007; Leikanger & Larson, 2012). Similarly, examinations of parent-reported anxiety symptoms in youth assessed via the MASC show moderate to high levels of stability regardless of their offspring's age (Baldwin & Dadds, 2007). However, neither the level of stability in youth-reported anxiety symptoms, nor the stability of parent-reported youth anxiety symptoms, over longer intervals (i.e., > 12 months) has been investigated. Additionally, little is known regarding the stability of father-reported youth anxiety as most studies examining the stability of parent-reported youth anxiety symptoms have focused on mothers.

Concurrent and Predictive Validity of Self- and Parent-Reported Youth Anxiety

Few studies have examined the concurrent and predictive validity of youth self-reported anxiety symptoms with regard to concurrent and subsequent anxiety disorders. One prior investigation using a sample of youth aged 7–14 found that self-reported anxiety symptoms on the Youth Self Report (YSR) were not associated with contemporaneous anxiety disorder diagnoses (Ebesutani et al., 2011). In contrast, research examining mother-reported youth anxiety symptoms assessed via the Childhood Behavior Checklist (CBCL) in early childhood accurately predicted anxiety disorder diagnoses in adolescence (Bosquet & Egeland, 2006). Additionally, in 12-year-olds, mother-reported youth symptoms assessed via the SCARED were superior to youth self-reports in predicting anxiety levels rated by independent observers in a laboratory task designed to provoke social anxiety (Bowers et al.,

2019). However, due to the paucity of research pertaining to the concurrent and predictive validity of self-reported and parent-reported youth anxiety symptoms, the conclusions that can be drawn regarding the relative concurrent and predictive validity of youth- and parent-reported anxiety symptoms is limited. Specifically, the independent contributions of parent and youth reports of anxiety symptoms in predicting concurrent and future anxiety disorder diagnoses are not well understood. Additionally, how the utility of reports changes over development, and at what ages these changes occur, is not known.

The Current Study

To address these gaps in the literature, the aim of the current study is to investigate the agreement, stability, and predictive utility of youth-, mother-, and father-reported ratings of youth anxiety symptoms in a cohort of 609 youth and their parents from middle childhood through middle adolescence. Participants each completed a widely used measure of anxiety symptoms and an interview assessing anxiety disorders when youth were aged 9, 12, and 15 years. Based on the existing cross-sectional investigations, we hypothesized that: 1) the magnitude of agreement between youth- and parent-reported symptoms of youth anxiety will increase over development, but remain small to medium in size, with agreement between youth-mother dyads being greater than between youth-father pairs, while agreement between parents will demonstrate consistently large effects; 2) stability of youth-reported anxiety symptoms will increase over time and will reach the level of stability of mother- and father-reported youth anxiety symptoms by age 15; and 3) the concurrent and predictive validity of youth-reported anxiety symptoms with respect to anxiety diagnoses will increase with age and reach the level of parent-reported youth symptoms by age 15.

Method

Participants

Data come from the Stony Brook Temperament Study, a large longitudinal study examining temperament and its relation to emotional disorders (Klein & Finsaas, 2017). Youth participants and at least one co-participating biological parent were recruited via commercial mailings lists from communities within twenty miles of Stony Brook University. Children with no developmental disabilities and at least one biological English-speaking parent were eligible. Although at least one biological parent was required for participation, non-biological parents or other primary caregivers were also invited to partake in the study as informants, although this was exceptionally rare ($n_{\text{age } 9} = 0$, $n_{\text{age } 12} = 0$, $n_{\text{age } 15} = 1$). Written consent from a primary caregiver was obtained, and families were compensated for participation in the study. All procedures were approved by the Stony Brook University Institutional Review Board. The initial sample consisted of 559 three-year old children. An additional 50 children were added at age 6 to increase the diversity of the sample. Participants have been assessed every 3 years since entering the study. This paper uses data from the three most recently completed waves: age 9 ($M = 9.17$, $SD = 0.37$), 12 ($M = 12.67$, $SD = 0.42$), and 15 ($M = 15.16$, $SD = 0.40$). Of the 609 families in the larger study, 531 families were included; inclusion required at least one participating family member (e.g., mother, father, or youth) to complete at least one measure (e.g., SCARED or K-SADS)

during at least one assessment wave (e.g., age 9, 12, and/or 15). The age 9 wave included 481 youth, 487 mothers, and 420 fathers. At the age 12 wave, 470 youth, 467 mothers, and 377 fathers were included. The age 15 wave included 448 youth, 454 mothers, and 371 fathers. Of children assessed at the age 9 wave, 46.5% were female and 79.7% were of Caucasian non-Hispanic descent. Of their parents, 80.2 % were married or cohabitating, 9.0 % were divorced or separated, 2.8% had never married, and 0.6% were widowed. With respect to education, 52.0 % of their mothers and 41.1% of fathers had a bachelor's degree or higher.

To examine the effects of attrition, participants who completed at least one of the age 9, 12, and 15 assessments were compared those who completed none of the three assessments on child gender, race/ethnicity, parental marital status, and maternal and paternal education at entry into the study. No significant differences were found between groups (all p 's > .18).

Measures

Youth Anxiety Symptoms—Mothers, fathers, and youth completed the 41-item SCARED (Birmaher et al., 1997) at the age 9, 12, and 15 waves. The SCARED is one of the most commonly used tools to assess self- and parent-reported anxiety symptoms in both clinical and research contexts. Participants rate items on a 3-point scale (0 = almost never, 1 = sometimes, 2 = often). Responses are summed, with scores reflecting total youth anxiety symptoms over the past three months. The SCARED demonstrates good internal consistency, test-retest stability, discriminant validity, and concurrent validity (Birmaher et al., 1997). The internal consistency of both parents' (α 's = .87 - .91) and youths' (α 's = .87 - .91) scores were excellent in the current sample (see Table 1).

Youth Anxiety Disorders—The diagnosis of any current (within the past month) anxiety disorder was assessed via the Kiddie Schedule for Affective Disorders and Schizophrenia - Present and Lifetime version (K-SADS; Kaufman et al., 1997). The K-SADS was administered separately to the youth and one parent at the age 9, 12, and 15 waves. Trained interviewers integrated the information from both informants to make diagnoses of generalized anxiety disorder (GAD), panic disorder (PD), agoraphobia (AG), social phobia (SOC), specific phobia (SP), and separation anxiety disorder (SEP). The use of semi-structured interviews that integrate information from both the child and a parent reduces shared reporter and method variance between measures of symptoms and diagnoses, and allows for interviewers to consider information from both reporters when using clinical judgement to make diagnoses based on the K-SADS.

The K-SADS was administered by trained research staff (master's level and clinical psychology Ph.D. students) closely supervised by a clinical psychologist (Dr. Daniel N. Klein) and a child and adolescent psychiatrist (Dr. Gabrielle Carlson). Inter-rater reliability estimates, expressed as kappas, from video recordings of the K-SADS ranged from $\kappa = .57$ (GAD) to $\kappa = 1.00$ (SEP; $N = 74$) at age 9, and from $\kappa = 0.75$ (SP) to $\kappa = 1.00$ (SAD; $N = 25$) at ages 12 and 15.

Data Analysis

Cross-sectional Pearson's bivariate correlations and intraclass correlations (ICC; two-way random with absolute agreement) were calculated between youth-, mother-, and father-reported anxiety symptoms at ages 9, 12, and 15 to examine agreement between reporters at each wave. Fisher's Z transformation was used to convert Pearson's correlation estimates into z-scores, which were then statistically compared to evaluate whether degree of agreement (i.e., correlations) varied between reporter pairs and across intervals (Fisher, 1921). Pearson's correlations and ICCs for self-, mother-, and father-reported youth anxiety symptoms were then calculated within reporters between waves (i.e., age 9–12, 12–15, and 9–15) to examine the stability of reports. Again, Fisher's Z transformation was used to convert Pearson's correlation estimates into z-scores, which were then statistically compared to evaluate whether stability coefficients varied between reporter pairs and across intervals (Fisher 1921). Next, point-biserial correlations were used to examine concurrent and prospective associations between parent and youth reports of anxiety symptoms and K-SADS past-month diagnoses. As only one parent completed the K-SADS interview, only the corresponding parent-report of youth anxiety symptoms was included in these analyses to avoid the outcome variable sharing unequal reporter variance with certain predictor variables (e.g., if the mother completed the age 12 K-SADS interview, then the mother-reported SCARED, but not the father-reported SCARED, was used). Finally, youth- and parent-reported youth anxiety symptoms were simultaneously entered as independent variables (IVs) in a series of logistic regression models with concurrent and subsequent wave K-SADS anxiety disorders at each wave as the dependent variables (DVs). These analyses provide information about which informant contributed significant unique variance to the diagnosis, beyond the variance contributed by the other reporter. A one degree-of-freedom Wald's chi-square (χ^2) test (Fox, 1997) was used to determine whether the magnitude of the associations of parent- and youth-reported anxiety symptoms with youth anxiety disorder diagnoses differed significantly within logistic regression models.

All analyses were conducted using Mplus 8 (version 8.3; Muthen & Muthen, 2012–2018). Full information maximum likelihood (FIML) estimation techniques were employed with a maximum likelihood (ML) estimator to account for missing data, allowing us to incorporate data from all participants who provided data at one or more of the age 9, 12, or 15 assessments. We interpreted effect sizes using Cohen's (1988) conventions (e.g., small: $r = .10$; medium: $r = .30$; and large: $r = .50$).

Results

Descriptive Statistics and Correlations

Means, standard deviations, reliability coefficients, and the proportion of participants diagnosed with an anxiety disorder at each assessment are reported in Table 1.

Agreement Between Reporters

Results of analyses examining cross-sectional agreement across youths', mothers', and fathers' reports on the SCARED, and Fisher's Z transformation comparisons, are presented in Table 2. At age 9, there was a small but statistically significant level of agreement

between both mother- and youth-, and father- and youth-, reports according to both Pearson correlations and ICCs. Comparisons of the magnitudes of the correlations using Fisher's Z transformation indicate that the magnitude of mother-youth and father-youth correlations did not differ, but they were both significantly weaker than the agreement between mother- and father-reported youth symptoms at age 9. At age 12, agreement between parents' and youths' reports increased; this increase was significant from age 9 for both mother-youth and father-youth pairs. Pearson's correlations for mother-youth and father-youth agreement were medium-sized, while ICCs were in the small-medium range. Similar to at age 9, the magnitude of mother-youth and father-youth correlations did not differ in magnitude, but they were both significantly weaker than the agreement between mother- and father-reported youth symptoms at age 12. At age 15, agreement between mother-youth reports continued to increase. However, these increases were non-significant according to the Fisher's Z transformation comparisons; Pearson correlations were still in the medium range for mother-child and father-child agreement, and the ICCs remained in the small-medium range. In contrast, mother- and father-reports of anxiety symptoms demonstrated a consistently high level of agreement across all three waves according to both Pearson's correlations and ICC, and the magnitude of the agreement correlations between mother-father pairs did not differ significantly at any ages.

Stability of Reports Across Time

Results of analyses examining the temporal stability of youth's, mothers', and fathers' reports of anxiety symptoms on the SCARED, and results from Fisher's Z transformation comparisons, are presented in Table 3. According to both Pearson correlations and ICCs, youth-reported anxiety symptoms exhibited a small-medium level of stability from ages 9 to 12 and from 9 to 15. Additionally, the magnitude of the stability correlations from ages 9 to 12 and 9 to 15 did not differ significantly according to Fisher's Z transformation comparisons. However, youth-reported anxiety symptoms from age 12 to 15 demonstrated a high level of stability, indicating a marked and statistically significant increase in stability from childhood to adolescence. Effect sizes for the stability of mother- and father-reports of anxiety symptoms were consistently large in magnitude across intervals, although some significant differences were present (e.g., stability across the longest interval [i.e., age 9–15] was significantly less than either of the shorter intervals [i.e., ages 9–12 and 12–15] for both mother- and father-reported anxiety symptoms). The stability of mother- and father-reported symptoms did not differ from one another at ages 9–12 or 9–15, but mother-reports demonstrated significantly greater stability from age 12–15 than father-reports. Moreover, despite significant improvement in the stability of reporting for youth by ages 12–15, the stability of both mother- and father-reported anxiety symptoms were still significantly greater than youth-reported symptoms.

Concurrent and Predictive Validity of Youth and Parent Reports

Concurrent and longitudinal point biserial correlations—Cross-sectional and longitudinal point-biserial correlations between youth- and parent-reported anxiety symptoms on the SCARED and K-SADS youth anxiety disorders at ages 9, 12, and 15 are presented in Table 4. Results indicate that self- and parent-reported youth symptoms were both significantly associated with youth anxiety disorder diagnostic status, cross-sectionally

and prospectively. At age 9, the magnitude of the association between parent-reported anxiety symptoms and youth anxiety diagnoses were considerably larger than those between youth-reported symptoms and diagnoses, both concurrently and prospectively. At age 12, the correlations between parent-reported anxiety symptoms and concurrent and subsequent youth anxiety diagnoses remained larger than the correlations between self-reported youth symptoms and youth diagnoses; however, the magnitude of the difference had narrowed substantially. Finally, at age 15 there was a reversal. The association between youth-reported anxiety symptoms and youth anxiety disorders was now larger than the magnitude of the relationship between parent-reported symptoms and disorders.

Concurrent logistic regression models—The logistic regression models examining simultaneous associations of youth- and parent-reported anxiety symptoms with concurrent youth anxiety diagnoses are presented in Table 4. At age 9, parent-reported anxiety symptoms, but not youth-reported symptoms, were independently associated with age 9 youth anxiety disorder diagnoses. The magnitude of the association with K-SADS diagnosis was significantly stronger for parent-reported anxiety symptoms than for youth-reported symptoms (Wald $\chi^2 = 15.60$, $p < .001$).

Age 12 parent- and youth-reported anxiety symptoms were each independently associated with age 12 youth anxiety disorders. However, at age 12, the association between parent-reported anxiety symptoms and age 12 youth anxiety disorder was significantly stronger than the association of youth-reported symptoms and anxiety diagnoses (Wald $\chi^2 = 11.52$, $p = .001$).

Finally, at age 15, both parent- and youth-reported anxiety symptoms were independently associated with age 15 anxiety disorder diagnoses. The magnitude of these associations was not significantly different (Wald $\chi^2 = 0.32$, $p = .55$).

Longitudinal logistic regression models—The logistic regression models with youth- and parent-reported anxiety symptoms predicting subsequent youth anxiety diagnoses are presented in Table 5. Both parent- and youth-reported anxiety symptoms at age 9 independently predicted age 12 youth anxiety disorders. However, parent-reported anxiety symptoms were a significantly more powerful predictor of age 12 youth anxiety disorders than youth-reported symptoms (Wald $\chi^2 = 11.43.05$, $p < .001$).

Only parent-reported anxiety symptoms at age 9 independently predicted anxiety disorders at age 15. Parent-reported anxiety symptoms were a significantly better predictor of age 15 youth anxiety disorders than age 9 youth-reported symptoms (Wald $\chi^2 = 7.05$, $p < .01$).

Finally, in the model examining the predictive validity of age 12 parent- and youth-reported anxiety symptoms, both parent- and youth-reported anxiety symptoms independently predicted age 15 youth anxiety disorders. The magnitude of these associations was not significantly different (Wald $\chi^2 = 1.30$, $p = .26$).

Discussion

The current study examined the agreement, stability, and concurrent and predictive validity of parent- and youth-reported anxiety symptoms on the SCARED from childhood through adolescence. There was a small but statistically significant level of agreement between both mother-child and father-child dyads at age 9, which increased significantly over time and reached a moderate level by ages 12. When examining statistical significance, results were similar for agreement of mother-child and father-child pairs using both Pearson's r s and intraclass correlations. The magnitudes of the Pearson's r s were slightly, but consistently, larger than the ICCs, which reflects the fact that Pearson's r indexes only rank-order agreement, whereas the ICC takes both rank-order and mean-level agreement into account. In contrast, agreement between the two parents on youth anxiety symptoms was consistently large and comparable in magnitude across waves, in terms of both Pearson's r and ICC approaches, reflecting high levels of both rank-order and mean-level agreement.

Similarly, the stability of youth-reported anxiety symptoms in the current investigation was low but statistically significant from ages 9–12 and 9–15. However, stability increased significantly between ages 12–15, with a large effect size that approached the high level of stability observed for mother- and father-reported youth anxiety symptoms, although it remained significantly weaker than the stability of either parent's reports. These findings are consistent when examining both the Pearson's correlation and ICC approaches.

We also examined the concurrent and predictive validity of parent- and youth-reported anxiety symptoms across development. The results from both the bivariate associations and logistic regression models indicated that at age 9, parent-reports of youth symptoms were superior to youth self-reports in predicting youth anxiety disorders, both concurrently and prospectively. By age 12, youth improved as reporters of their anxiety symptoms, and self-reported symptoms significantly predicted concurrent and prospective anxiety disorders; however, the magnitude of concurrent associations of parent-reported youth symptoms with youth disorders remained larger than that with youth-reported symptoms. Finally, by age 15, parent- and youth-reported anxiety symptoms were comparable in their associations with concurrent youth anxiety disorders. Taken together, we see that both youth and parents provide important and useful information about anxiety across all ages, as indexed by the significant and sizable point-biserial correlations. Additionally, these results suggest that youths' reporting of anxiety symptoms improves over the course of the transition from late childhood into adolescence, and models examining incremental validity show that youth reports match the validity of parent reports by age 12 and age 15 when predicting prospective and concurrent anxiety disorders, respectively. In contrast, the concurrent and predictive validity of parent-reports of youth anxiety is consistent across development.

The increases in agreement, stability, and concurrent and predictive validity of youth reported anxiety symptoms from childhood to adolescence are likely attributable to developmental changes in cognitive abilities (Muris, Vermeer & Horselenberg, 2008; Reueterskiold, Lars-Goran, & Ollendick, 2008). Specifically, as children transition into adolescence, their ability to understand and interpret their emotions, report on their physical symptoms, and recognize the links between physical symptoms and internal mood states

improves (Muris et al., 2008). Similarly, the cognitive development that occurs during these ages likely contributes to improved understanding of how to represent internal feelings on a likert-type scale. Furthermore, some adolescents may be more willing or able to verbalize and disclose symptoms than at younger ages, contributing to the increase in parent-youth agreement (Reueterskiold et al., 2008). An alternative explanation is that the settings that youth and parents are basing their reports of youth anxiety on become increasingly different over the course of development as adolescents have greater autonomy. Indeed, prior work has demonstrated that low levels of correspondence between youth and parent reports of youth symptomology may reflect, at least in part, differences in the settings in which the informants observe the behaviors being assessed (e.g., home vs. school; Comer & Kendall, 2004; De Los Reyes & Kazdin, 2005; De Los Reyes, Thomas, Goodman, & Kundery, 2013; Ohannessian & De Los Reyes, 2014). A final possibility is that parents fail to alter their views of their children's anxiety despite changes, and that youth reports are more sensitive to fluctuations in their levels of symptoms over time.

Low to moderate levels of agreement between parent and youth reports of youth anxiety symptoms have been reported previously (Bowers et al., 2019; Goolsby et al., 2018; Hughes & Gullone, 2010). Additionally, prior studies examining agreement between parents have demonstrated a consistently high level of concordance (Hughes & Gullone, 2010). However, the aforementioned studies have employed cross-sectional designs, limiting the examination of agreement between reporters to single time points, and have rarely examined how concordance changes developmentally using a within-person design. The current findings add to the literature by demonstrating that the level of agreement between reporters of youth-anxiety symptoms increases from childhood through adolescence within parent-child dyads. Results also expand upon current literature by demonstrating a consistent level of agreement between mother- and father- reported youth anxiety, regardless of offspring age.

Prior investigations have demonstrated a high level of stability in youth-reported anxiety symptoms during late childhood and adolescence (Baldwin & Dadds, 2007 & Leikanger & Larson 2012). The current study extends this literature by examining youth stability at an earlier age (i.e., age 9) and across a longer period of time (i.e., ~36 – 72 months between assessments). Our results suggest a relatively lower level of stability in youth-reported symptoms between age 9 and age 12 compared to previous investigations, and significantly lower levels of stability compared to mother- and father-reported youth symptoms during the same interval. One possible explanation for this may be the longer follow-up assessment duration; prior studies utilized 12-month intervals between assessments whereas the current study included a three-year gap between each assessment. However, our findings show that the stability of youth-reported symptoms increased between the ages of 12–15, reaching a high level, yet the stability was still significantly lower than that of mothers or fathers. The increased stability of self-reported youth anxiety symptoms by age 15 may reflect improvements in the reliability and validity of their reports, corresponding to their greater introspective abilities and stability of their sense of self during this time. Additionally, few studies have examined the stability of father-reported youth anxiety symptoms. We extend the existing literature by using the largest sample of fathers to date and demonstrating that the level of stability of fathers' reports of youth anxiety is generally similar to that of mothers' reports.

Of the few prior studies that have compared the associations of parent- and youth-reported anxiety symptoms with anxiety disorders, all relied on cross-sectional designs. The current investigation is the first to use a longitudinal design and an outcome measure that does not advantage either informant, as diagnoses of youth anxiety disorders were made by trained clinical interviewers who obtained information from both a parent and the youth separately and then integrated the information using clinical judgment. These results highlight the incremental value of youth-reported symptoms as early as age 9, but demonstrate that youth improve as reporters of their symptoms as they get older.

The results from the present study have significant clinical implications. At younger ages (e.g., under age 12), youth-reported symptoms of anxiety alone are not sufficient, and parent reports are needed. However, given the significant unique associations of both parent and youth anxiety symptoms with youth anxiety disorders as early as age 9, it appears that parents and youth are reporting on somewhat different aspects of anxiety (i.e., youth may be reporting upon internal unobservable states whereas parents report more upon external displays of worry or physical symptoms) or differences in the settings in which the observations of anxiety occur (De Los Reyes & Kazdin, 2005; De Los Reyes, Thomas, Goodman, & Kundey, 2013; Ohannessian & De Los Reyes, 2014). Hence, even though the stability of youth self-reports and parent-youth agreement increase substantially during adolescence, it is advisable to obtain information about youth anxiety from both sources.

Finally, the current study included fathers who are typically neglected in psychopathology research. Exclusion of fathers from research in this area has repeatedly been noted as a significant gap in the literature (Baker, Iles & Ramchandani, 2017; Cassano, Adrian, Veits, Zeman, 2006; Parent et al., 2017; Phares & Compas, 1992), as they can provide an additional source of information to complement mothers' reports. Although few studies have examined paternal reporters in investigations of youth psychopathology, fathers' reports appear to have equivalent convergent validity as data from mothers (Parent et al., 2017). The present findings add to the limited existing literature and are consistent with prior studies showing that mother- and father- reports are similar to one another with regards to agreement with youth-reported symptoms and stability across time.

The current study had numerous strengths, including the use of a large sample and longitudinal design spanning 6 years and three separate assessments during the transition from childhood to adolescence. Consistent use of the same measures at all time points allowed for direct comparisons across this critical developmental period and three assessment points provided additional granularity in results that cannot be provided by two-timepoint studies. Additionally, the employment of an even-handed outcome (a diagnostic interview with both parent and child) reduced the impact of shared reporter and shared method variance. Finally, our sample included fathers who are typically underrepresented in the literature (Parent et al., 2017; Phares & Compas, 1992).

However, the study also had several limitations. First, in models comparing youth- and parental-reports as predictors of anxiety disorders, reports may be biased towards parent-reports at younger ages depending on how interviewers weigh the reliability of the information gathered from each reporter. However, interviewers were trained to carefully

weigh all information gathered, including information gathered from the youth during the interview, substantially reducing potential bias. Additionally, we expect the bias to be roughly equivalent across reporters, given that both sources are considered when making diagnoses. Second, the sample is primarily comprised of families from middle-class, white non-Hispanic backgrounds, limiting the generalizability of the findings. Third, although non-biological parents and parents who are divorced are included in our sample, the majority of parents were biological and married, potentially limiting generalizability to other groups of parents. Fourth, due to the non-clinical community-based nature of our sample, rates of specific anxiety disorders were too low to examine specific forms of anxiety. Finally, we relied on a single measure when examining parent and self-reported anxiety, although the SCARED is one of the best-validated and most widely used measures of youth anxiety.

In summary, this study extends the literature by examining the agreement, stability, and concurrent and predictive validity of parent- and youth-reported anxiety symptoms in the context of a longitudinal design, which begins earlier and follows youth longer than prior investigations, spanning childhood and adolescence. We found that the effect sizes for agreement between parent- and youth-reported anxiety symptoms were small in childhood but increased with development, reaching a medium-large effect size by age 15. This contrasted with the large effects for agreement between mothers and fathers over the same developmental span. We also observed an increase in the stability in youth-reported anxiety symptoms over development, which, in adolescence, reached similar levels to those seen in parents; although the stability of mothers' reports remained superior to youth, and mothers demonstrated greater stability than fathers' reports of youth anxiety symptoms, youth demonstrated similar levels of stability in their reports of symptoms compared to fathers, and the magnitude of the discrepancy between youth and mothers was much smaller than at younger ages. Finally, we found increases in the concurrent and predictive validity of youth-reported anxiety symptoms as youth transitioned from childhood to adolescence. Taken together, these findings support conventional wisdom that in childhood, although youths' self-reports of anxiety symptoms have some value, parents' reports should generally be given greater weight. However, by mid-adolescence, youths' self-reports of anxiety symptoms appear to be comparable in reliability and validity to parents' reports. Additional research is needed to examine if similar patterns exist across more diverse samples and to examine the role of gender in youths' self-reported anxiety symptoms.

Financial Support:

This study was supported by National Institute of Mental Health grant R01 MH069942 awarded to D.N.K.

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Table 1

Descriptive statistics for age 9, 12, and 15 youth anxiety symptom and disorder variables

Variable	N/%	M/%	SD	α
Age 9 Self-report	481/90.6	19.80	11.40	0.89
Age 9 Mother-report	487/91.7	7.97	8.02	0.90
Age 9 Father-report	420/79.1	6.72	6.54	0.88
Age 12 Self-report	470/88.5	16.70	10.53	0.90
Age 12 Mother-report	467/87.9	7.95	7.89	0.91
Age 12 Father-report	377/71.0	7.03	6.82	0.89
Age 15 Self-report	448/84.4	17.29	12.36	0.93
Age 15 Mother-report	454/85.5	6.75	7.65	0.91
Age 15 Father-report	371/69.9	6.05	6.67	0.90
Age 9 Anxiety disorders	487/91.7	12%	--	0.85
Age 12 Anxiety disorders	476/89.6	13%	--	0.96
Age 15 Anxiety disorders	458/86.3	12%	--	0.96

Note. N/% corresponds to the number and percentage of the eligible 531 participants who completed the given assessment measure. α = Internals consistency for questionnaire measures and inter-rater reliability for interview measures

Table 2

Agreement of self-, mother-, and father-reported youth anxiety symptoms

	Child with Mother		Child with Father		Mother with Father	
	<i>r</i>	<i>ICC</i>	<i>r</i>	<i>ICC</i>	<i>r</i>	<i>ICC</i>
Age 9 Anxiety Symptoms	.17 ^{**} _{a,1}	.09 ^{**}	.12 [*] _{a,1}	.05 [*]	.50 ^{**} _{b,1}	.56 ^{**}
Age 12 Anxiety Symptoms	.36 ^{**} _{a,2}	.24 ^{**}	.31 ^{**} _{a,2}	.18 ^{**}	.53 ^{**} _{b,1}	.52 ^{**}
Age 15 Anxiety Symptoms	.46 ^{**} _{a,2}	.27 ^{**}	.31 ^{**} _{b,2}	.16 ^{**}	.52 ^{**} _{a,1}	.52 ^{**}

Note.

^{***} $p < .001$ (2-tailed).

^{**} $p < 0.01$ (2-tailed).

^{*} $p < 0.05$ (2-tailed).

Anxiety symptoms were assessed using the Screen for Child Anxiety Related Disorders (SCARED). Results of Fisher's Z Transformation comparisons are specified using subscripts. Letters are used to demonstrate which correlations differ in magnitude across rows. Numbers are used to demonstrate which correlations differ in magnitude across columns. The same letters/numbers indicate that the magnitude of the correlations does not differ significantly across that row/column, respectively. Different letter/numbers indicate those correlation pairs differ significantly in magnitude across that row/column, respectively.

Table 3

Stability of self-, mother-, and father-reported youth anxiety symptoms

	Youth		Mother		Father	
	<i>r</i>	<i>ICC</i>	<i>r</i>	<i>ICC</i>	<i>r</i>	<i>ICC</i>
Age 9 - Age 12	.25 ^{***} _{a,1}	.23 ^{***}	.65 ^{***} _{b,1}	.65 ^{***}	.68 ^{***} _{b,1}	.68 ^{***}
Age 9 - Age 15	.24 ^{***} _{a,1}	.22 ^{***}	.55 ^{***} _{b,2}	.55 ^{***}	.53 ^{***} _{b,2}	.53 ^{***}
Age 12 - Age 15	.57 ^{***} _{a,2}	.57 ^{***}	.74 ^{***} _{b,3}	.73 ^{***}	.65 ^{***} _{a,1}	.64 ^{***}

Note.

^{***} $p < .001$ (2-tailed).

^{**} $p < 0.01$ (2-tailed).

^{*} $p < 0.05$ (2-tailed).

Anxiety symptoms were assessed using the Screen for Child Anxiety Related Disorders (SCARED). Results of Fisher's Z Transformation comparisons are specified using subscripts. Letters are used to demonstrate which correlations differ in magnitude across rows. Numbers are used to demonstrate which correlations differ in magnitude across columns. The same letters/numbers indicate that the magnitude of the correlations does not differ significantly across that row/column, respectively. Different letter/numbers indicate those correlation pairs differ significantly in magnitude across that row/column, respectively.

Point-biserial correlations between anxiety symptoms and disorders across youth- and parent-reporters

Table 4

	Age 9 Anxiety Disorders	Age 12 Anxiety Disorders	Age 15 Anxiety Disorders
	<i>r</i>	<i>r</i>	<i>r</i>
Age 9 Child-report	.23**	.26*	.17*
Age 9 Parent-report	.47***	.47***	.35***
Age 12 Child-report	--	.42***	.38***
Age 12 Parent-report	--	.57***	.42***
Age 15 Child-report	--	--	.55**
Age 15 Parent-report	--	--	.47**

Note.

p < .001 (2-tailed).

**
p < 0.01 (2-tailed).

*
p < 0.05 (2-tailed).

r = point-biserial correlations. Only one biological parent completed the interview. Of the 487, 476, and 458 K-SADS interviews completed at age 9, 12, and 15, respectively, 449 (92.2%), 426 (89.5%), and 407 (91.3%) were completed by mothers, with the remaining interviews being completed by fathers. The "Parent-report" on the SCARED corresponds to the parent who completed the K-SADS interview.

Table 5

Results from multiple regression analyses of self- and parent-reported anxiety symptoms predicting youth anxiety disorders

	Age 9 Anxiety Disorders					Age 12 Anxiety Disorders					Age 15 Anxiety Disorders								
	<i>R</i> ²	<i>b</i>	S.E.	β	OR	95% CI	<i>R</i> ²	<i>b</i>	S.E.	β	OR	95% CI	<i>R</i> ²	<i>b</i>	S.E.	β	OR	95% CI	
Model <i>R</i> ²	.24						.24						.13						
Age 9 Child-report		0.02	0.01	0.13	1.02	1.00, 1.05		0.03	0.01	0.15	1.03*	1.00, 1.06		0.02	0.01	0.11	1.02		0.99, 1.05
Age 9 Parent-report		0.12	0.02	0.44	1.12 ^{***, †}	1.08, 1.16		0.11	0.02	0.42	1.11 ^{***, †}	1.10, 1.15		0.08	0.02	0.32	1.08 ^{***, †}		1.05, 1.12
Model <i>R</i> ²						.36							.22						
Age 12 Child-report		--	--	--	--	--		0.05	0.02	0.23	1.05 ^{***}	1.02, 1.08		0.05	0.01	0.27	1.05 ^{***}		1.03, 1.08
Age 12 Parent-report		--	--	--	--	--		0.14	0.02	0.50	1.15 ^{***, †}	1.11, 1.20		0.08	0.02	0.31	1.09 ^{***}		1.05, 1.13
Model <i>R</i> ²						.35													
Age 15 Child-report		--	--	--	--	--		--	--	--	--	--		0.08	0.02	0.42	1.08 ^{***}		1.05, 1.11
Age 15 Parent-report		--	--	--	--	--		--	--	--	--	--		0.09	0.01	0.30	1.10 ^{***}		1.06, 1.14

Note.

*** *p* < .001 (2-tailed).

** *p* < .01 (2-tailed).

* *p* < .05 (2-tailed).

OR = Odds ratio.

† = predictor is significantly more powerful than the other variable in the model.

CI = Confidence interval. CIs that do not overlap with 1.00 indicate statistically significant predictors in the logistic regression models. Only one biological parent completed the interview. Of the 487, 476, and 458 K-SADS interviews completed at age 9, 12, and 15, respectively, 449 (92.2%), 426 (89.5%), and 407 (91.3%) were completed by mothers, with the remaining interviews being completed by fathers.