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Correlates and Consequences of Suicidal Cognitions and Behaviors in Children Ages 3–7

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Abstract

Objective—Despite research documenting the existence of depression and other psychiatric disorders in early childhood, little is known about the nature and consequences of suicidal cognitions and behaviors (SI) in young children ages 3–7. The identification of trajectories of SI across childhood is a critical step towards preventing childhood suicide.

Method—Participants were 306 children enrolled in a prospective longitudinal investigation of young children and their families. Children and their families completed a baseline assessment between ages 3–7, and 1 follow-up assessment (ages 7–12). Child psychopathology, suicidal thoughts, plans, and behaviors were assessed via parent and trained interviewer report before age 9, and also with self-report after age 9. Data on maternal history of psychopathology, as well as maternal and family history of suicide attempts were also obtained through parent report.

Results—Controlling for a range of clinical and demographic variables, early childhood SI (as defined as suicidal thoughts, behavior or any expression of plans/attempts occurring prior to age 7) and suicidal themes in play were concurrently associated with childhood attention-deficit/hyperactivity (ADHD) and oppositional defiant/conduct disorders (ODD/CD). Early-childhood SI

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also predicted school-age depression and ODD/CD; however, these findings were no longer significant after controlling for the same diagnoses at the childhood baseline. Longitudinal analysis indicated that early-childhood SI was a robust predictor of school-age SI, even after accounting for psychiatric disorders at both time points.

Conclusion—Extending current research, these findings demonstrate that early-childhood SI confers significant risk for continuation into school-age and is concurrently associated with ADHD and ODD/CD. While the meaning of early-childhood SI remains unclear, results suggest that it is a clinically important phenomenon that should be carefully assessed and taken seriously as a marker of risk for ongoing suicidal ideation/behavior. These findings suggest that early screening for SI in childhood is indicated in clinical settings, particularly in children under age 7 with depression and externalizing disorders.

Keywords

early childhood; suicidality; longitudinal; psychopathology

INTRODUCTION

After more than a decade of research documenting the existence of depression and other mental health disorders early in childhood¹, we still know very little about the nature and consequences of suicidal cognitions and behaviors (SI) in young children ages 3–7. As such, it is unknown whether SI earlier in childhood represents transient developmental and non-specific expressions of distress, or whether it predicts persistent suicidal cognitions and behaviors later in development. The identification of the trajectory of SI across childhood is an important first step towards preventing childhood suicide.

To date, several empirical studies have focused on childhood-onset SI, with very few studies to inform SI occurring prior to age 7. In one of the first studies to assess childhood-onset SI, Pfeffer et al. found that 72% of psychiatrically hospitalized children (N = 58) aged 6–12 exhibited some SI². These children endorsed more depression, hopelessness/worthlessness, wanting to die, and preoccupations with death. A recent review identified several risk factors for suicide in childhood³. Specifically, parental history of suicidal attempts and psychopathology, child's previous history of SI, and child's psychopathology, particularly affective and disruptive disorders, emerged as risk factors among children under age 14. For example, in a longitudinal study spanning nearly six years, children who had a parent attempt suicide were at almost a five-fold greater risk for attempting suicide⁴. In addition to parental history of psychopathology and suicide attempts, psychopathology is often present in children with SI, with rates of diagnosable disorders averaging around 50%^{5,6} and rates of subsyndromal difficulties likely much higher⁷. Compared to youth without SI, children and adolescents with SI are more likely to have serious psychopathology, such as major depressive disorder, internalizing, and externalizing disorders^{8–10}.

There is also evidence for longitudinal associations between childhood SI and adolescent/adult SI. The high rates of previous SI among children who later committed suicide^{5,6,8,9} suggest that SI, even in children, is likely to be chronic and persistent. In addition, childhood SI, defined as occurring prior to age 11 in the study cited, predicted adult SI in a longitudinal

study⁸. However, little is known about the long-term outcomes of SI that begins even earlier in children ages 3–7.

Most work on childhood SI has focused on older children, with a few participants as young as age 5 included. Consequently, there is limited work addressing the correlates and consequences of SI, and whether and under what circumstances SI could arise earlier in development during the ages of 3–7^{11–15}. While it may be questioned whether young children can understand these constructs, empirical evidence has shown that while children's conceptions of death and suicide change across development, they vary as a function of personal experiences with death, suicide, religion, and education^{16–21}. However, empirical evidence indicates that young children possess a more elaborate understanding of death and even suicide than generally assumed. Thus, while a younger child's conception of death or suicide is less complex than an older child's or adult's concepts, studies suggest that around age 4, children understand that death leads to a cessation of the ability to act and is distinguished from sleep^{16,18,22,23}.

While most young children (ages 4–8) are able to verbalize the inevitability and irreversibility of death^{17,24}, few are able to state the ways in which people die,²⁴ and little is known about young children's understanding of suicide. However, it appears that children's concepts of suicide are related to their concepts of death^{17,25}. In a study of first through fifth graders, all but three children (all first graders) were able to define and discuss “killing oneself¹⁶.” All children who could define and discuss “killing oneself” were able to mention viable methods for doing so, such as using a knife or firearm¹⁶. Although not specific to early childhood, the results from this study might suggest that children between 6–10 years of age “know full well that an intentional act of suicide will result in death and understand that death is permanent and final,” (16; p. 115). In both studies, children's understanding of suicide was related to their cognitive maturity and their experiences (both personal and in the media) with suicide^{16,17}. However, there have been no studies to our knowledge that focus specifically on children's conceptions of suicide during ages 3–7.

A growing preliminary research base documents the presence of SI in young children often assumed to be too emotionally immature to contemplate and understand the consequences of such actions. In one of the only available studies using young children (ages 2 ½ – 5 years old), a small sample referred to an outpatient psychiatry clinic due to SI (N = 16) were also found to be more hyperactive/impulsive, higher on depressive symptoms, more likely to run away from home, and have higher rates of abuse or neglect when compared to a matched group of young children with behavior problems but without SI¹². Further, most (n = 13) of these young children had made multiple suicide attempts prior to enrollment in the study (despite being a relatively rare phenomenon). Given this suggestive data, and the validity of depressive disorders in early childhood²⁶, studies that investigate the clinical correlates of SI in young children are now needed.

Four of the known risk factors for childhood SI (e.g., parental history of suicidal attempts and psychopathology; child's previous history of SI and psychopathology)³ have yet to be explored with children ages 3–7. For instance, children aged 3–7 may not comprehend the meaning of SI in caregivers (e.g., may see it as non-specific distress), or may be more

protected from the impact of SI (e.g., mothers may be less likely to express SI to younger children). It may be that general parental psychopathology exerts a more influential role in the development of early SI²⁷. Alternatively, there may be important familial influences in SI, in which case it would be expected that SI earlier in childhood would be strongly predicted by parental history of suicide attempts. The psychopathological correlates of SI during ages 3–7, and specifically whether this is associated with depressive disorders or other, more non-specific psychopathology, also remain under investigated. In one study, preschoolers with both bipolar and unipolar depression endorsed SI, with the bipolar group exhibiting SI at significantly higher rates²⁸. Given that SI has both a mood component and an impulsivity component, an association with either or both mood disorders and externalizing disorders, such as oppositional defiant disorder (ODD) earlier in childhood seems possible.

To our knowledge, no empirical studies have longitudinally investigated outcomes among children ages 3–7 expressing SI. This research is particularly important given the increasing prevalence rates of SI from childhood into adolescence²⁹, the increasing rates of suicide in specific groups of children³⁰, and enhanced risk for completed suicide once a child has made an attempt. Furthermore, research has consistently demonstrated the risk, etiology, and deleterious psychological and neurobiological outcomes associated with early childhood psychopathology, such as depression^{1,31–33}. Given the homotypic continuity and stability of childhood psychopathology, research in the area of SI occurring earlier in childhood may elucidate additional trajectories of chronic impairment at younger ages, extending opportunities for intervention.

The purpose of this study was to investigate the occurrence and correlates of childhood SI occurring during ages 3–7 in a high-risk sample studied longitudinally. Given that SI likely exists on a continuum ranging from suicidal ideation to suicide attempts, identifying the presence of SI in young children is of great public health significance. Given existing theoretical models^{34,35} and empirical reviews of childhood SI³⁶, we predicted that early-childhood SI would be associated with concurrent, early childhood psychopathology, specifically depression and externalizing disorders, as well as maternal history of psychopathology and suicide attempts. We hypothesized that early-childhood SI would also predict school-age diagnoses and school-age SI, over and above relevant demographic and clinical variables.

METHOD

Participants

Participants were enrolled in the Preschool Depression Study (PDS), a prospective longitudinal investigation of young children and their families conducted at Washington University²⁶. The current study reports on 306 children from the PDS who completed an early childhood baseline assessment between ages 3–7 ($M = 5.35$, $SD = 0.86$, Range 37–83 months) and at least one additional school-age psychiatric assessment between the ages of 7–12 ($M = 9.56$ $SD = 0.89$). Parental written consent and child assent were obtained prior to participation, and the Washington University Institutional Review Board approved all procedures.

Details of recruitment have been previously reported^{26,31}. Participants in this study were enrolled during 2003–2005. Young children between the ages of 3–7 were recruited from primary care practices and preschools/daycares throughout the St. Louis metropolitan region using a screening checklist to oversample children with symptoms of depression and healthy controls, with the aim of recruiting a large group of ethnically and socioeconomically diverse young children with depression and smaller groups with both disruptive disorders and healthy for comparison. At baseline, 12 children were 3, 92 children were 4, 126 children were 5, and 76 children were 6.

Measures

Child Psychopathology and Traumatic Life Events—Psychiatric diagnoses were assessed at each time point using the Preschool Age Psychiatric Assessment (PAPA^{37,38}) when participants were between the ages of 3–8 and the Child and Adolescent Psychiatric Assessment (CAPA^{39,40}) at 9 and older. The PAPA and CAPA consist of a series of developmentally appropriate questions assessing the *DSM-IV* criteria for childhood disorders with information being obtained from parents prior to age 9 (via the PAPA) and making use of both child and parent reports after age 9 (via the CAPA). 272 children were over age 9 at follow-up and therefore used the CAPA interview. For the purpose of the present report, meeting *DSM-IV* criteria for the following disorders was assessed: depression ($\kappa = 1.0$; ICC = 0.98), attention-deficit/hyperactivity disorder (ADHD), ODD/CD, posttraumatic stress disorder (PTSD), and anxiety disorders (combined generalized anxiety and separation anxiety). In addition, for school-age assessments, diagnoses of panic and social anxiety were also included in the anxiety diagnosis composite variable. These symptoms were not assessed during the early childhood period. All diagnoses were coded as 0, '*DSM-IV* diagnostic criteria not met,' or 1 '*DSM-IV* diagnostic criteria met.'

The PAPA and CAPA also assessed the frequency of traumatic life events, as reported by caregivers, at each annual assessment. The PAPA and CAPA define traumatic life events as any type of emotionally harmful life events including abuse, natural disasters, serious accidents, and unexpected deaths⁴¹. The total number of reported traumatic life events was used as a continuous variable.

Income-to-Needs Ratio—Mothers reported family income at each assessment. The income-to-needs ratio was computed as the total family income at baseline divided by the federal poverty level, based on family size, at the time of data collection⁴².

Maternal History of Psychopathology—The Family Interview for Genetic Studies (FIGS⁴³) assessed for the presence of psychopathology and SI in first- and second-degree relatives. The following disorders were assessed in mothers: depression, bipolar, anxiety, suicide attempt or completion, ADHD, substance abuse, and CD. History of suicide attempts or completion was assessed via the following question, "Did anyone (in your family): Attempt or complete suicide?" This is a widely-used and well-validated fully structured measure of family history of psychiatric disorders. A senior psychiatrist (JLL), blind to the child's diagnostic status, reviewed questions about the diagnostic status of a family member. This report focuses on three variables: maternal history of psychopathology, maternal history of

suicide attempts, and history of suicide attempts in first/second degree relative, all coded as 0 'no' and 1 'yes.'

Suicidal Cognitions and Behaviors (SI)—Suicidal thoughts, behavior, and any expression of plans or attempts were assessed using the PAPA (prior to age 9) and CAPA (after age 9), as well as a measure of impairment from self-harmful behavior (PECFAS/CAFAS, see below) completed by interviewers who had met all reliability criteria set forth by the PECFAS/CAFAS authors. The following provides a description of items that were assessed. Death and suicidal thoughts were assessed via parent endorsement (e.g. repeated/persistent/intrusive or absent) of either: (1) Does s/he seem to think about or talk about death or dying?; or (2) Does s/he ever think about ending it all? Suicidal plans and intent were assessed by parent endorsement (e.g. either present or absent) of: (1) Has s/he thought about actually killing her/himself?; or (2) Has s/he had a plan to kill her/himself? Suicidal behavior and attempts were assessed by parent endorsement (e.g. either present or absent) of: (1) Has s/he ever tried to kill her/himself?

Interviewers, who achieved reliability criteria, completed the Preschool and Early-Childhood Functional Assessment Scale (PECFAS⁴⁴). The PECFAS assesses the psychosocial functioning and impairment of children between the ages 3–7 based on information gleaned from the PAPA/CAPA as well as other sources. For this report, the self-harmful behavior subscale was used. Interviewers rated children as having severe (e.g., has a plan to hurt self), moderate (e.g., talks repeatedly about harming or killing self), mild (e.g., repeated non-accidental behavior suggesting self-harm), or no impairment. At baseline, 3 children were rated as severe, 11 were rated as moderate, and 28 for mild impairment. For the purpose of the present report, early childhood SI was coded as 0 “no” and 1 “yes” if any of the above items (e.g. PAPA/CAPA or PECFAS) were endorsed by parent or interviewer report between ages 3–7 ($\alpha = 0.58$).

During school-age, SI was assessed using similar questions on the CAPA (during assessments after age 9) and PAPA (at each assessment). In addition, item 9 from the Children’s Depression Inventory (CDI⁴⁵) was included from children’s self-reports (e.g., I think about killing myself). CDI data is not available during the early childhood period as this instrument is valid for children over age 8. School-age SI was coded as 0 “no” and 1 “yes” if any of the above items were endorsed by self, parent, or clinician report ($\alpha = 0.61$). All children reporting SI were encouraged to seek treatment, and referrals were provided to parents/caregivers. Immediate action (e.g. walking the child and family to the hospital) was taken with any child endorsing suicidal intent.

Suicidal Themes in Play—Death and suicidal themes in play were also assessed via the PAPA interview. Parent endorsement of death and/or suicidal themes in play recorded as either present or absent based on the following questions: (1) Has s/he ever engaged in fantasy play that persistently involves death or dying?; or (2) Has s/he ever played games in which s/he or another character in the game kills her/himself? Suicidal themes in play were not included in our SI variable described above; however, exploratory analyses were conducted to determine any diagnostic correlates of this behavior in children ages 3–7 and whether this behavior predicts school-age psychiatric disorders.

RESULTS

Correlates of SI during Ages 3–7

Table 1 presents data on each SI item and suicidal themes in play at the early-childhood baseline (ages 3–7) and school-age follow-up assessments and Table 2 presents descriptive statistics for all variables at baseline. Examples of early-childhood SI are listed in Supplement 1, available online. SI was present in approximately 11% of children ages 3–7 in this sample ($n = 34/306$) and 73% ($n = 25/34$) of these youth continued to endorse SI at the school-age follow-up assessment.

Early childhood SI was concurrently associated with several demographic variables at the baseline assessment including male gender ($\chi^2_{(1)} = 3.93$; $p < .05$) and maternal psychiatric diagnoses ($t_{(300)} = -3.66$; $p < .000$). Maternal or family history of suicide attempts was not concurrently associated with early childhood SI. No significant group differences were found between children's age at baseline, age at follow-up, family income-to-needs ratio, or history of traumatic life events among children with and without SI. However, significant effects were found for early-childhood psychopathology: children ages 3–7 with SI were more likely to meet criteria for depression, ADHD, ODD/CD, and anxiety disorders (Table 2). Young children with and without SI were equally likely to meet criteria for PTSD.

Logistic regressions were conducted to investigate whether early childhood SI was associated with meeting diagnostic criteria for the disorders listed above at the baseline assessment, while controlling for gender, age, income-to-needs ratio, the presence of maternal psychopathology, and the presence of other disorders during ages 3–7 (e.g., when predicting early childhood depression, ADHD, ODD/CD, and anxiety disorders during childhood were controlled). Early-childhood SI was positively associated with concurrent early-childhood ADHD (OR = 2.68) and ODD/CD (OR = 2.83; Table 3), after controlling for the above-mentioned covariates, but early childhood SI was not associated with concurrent depression or anxiety disorders (Table 3).

Correlates of Suicidal Themes in Play during Ages 3–7

Fourteen children endorsed suicidal themes in play and no other SI item. Independent sample t -tests and χ^2 analyses were conducted to compare young children only reporting persistent death themes in play ($n = 14$) to young children reporting additional SI item endorsement, without including play themes ($n = 34$). There were no significant differences between the two groups in terms of demographic variables, presence of early-childhood disorders, or presence of school-age disorders (Table S1, available online). In addition, we compared young children who only reported persistent death themes in play ($n = 14$) to young children who did not report any SI ($n = 258$). Young children who only reported persistent death themes in play were more likely to be male ($\chi^2_{(1)} = 4.95$; $p < .05$). While there were no other demographic or maternal psychopathology differences between the groups, children ages 3–7 who only reported persistent death themes in play were more likely than young children not endorsing any SI variable to meet criteria for early childhood depression, ADHD, and ODD/CD. Furthermore, these young children were more likely to

meet criteria for depression and anxiety disorders during school age (Table S2, available online).

Predicting School-Age Psychopathology From SI During Ages 3–7

Logistic regressions were run to predict children's diagnoses at the school-age follow-up assessment, approximately 3–4 years later ($M = 3.78$ years later; Range = 1–6 years) from early-childhood SI, while controlling for gender, age at school-age follow-up assessment, income-to-needs ratio at school-age follow-up assessment, and maternal psychopathology (Table 4). Early childhood SI predicted school-age depression ($OR = 3.28$) and ODD/CD ($OR = 3.15$). After controlling for baseline disorders present earlier in childhood, however, these results became nonsignificant (Table 4).

Predicting School-Age SI From SI During Ages 3–7

Logistic regression was performed to assess the impact of the demographic variables listed above and early childhood SI on the likelihood of school-age SI. The model contained five independent variables (current age, gender, income-to-needs ratio, maternal psychopathology, and early childhood SI) and was significant ($\chi^2 = 23.24$; $p < .001$), demonstrating the ability to distinguish children who reported school-age SI from those who did not. As shown in Table 5, two independent variables made unique, statistically significant contributions to the model (income-to-needs ratio and early childhood SI). The strongest predictor of school-age SI was early-childhood SI, with an odds ratio of 5.79. These findings indicate that children with SI occurring during ages 3–7 were four times as likely as children without SI to report school-age SI, controlling for all other risk factors in the model. The odds ratio of .68 for income-to-needs ratio was less than one, indicating that children whose families reported more income, relative to needs, were less than half as likely to report school-age SI, controlling for other factors in the model.

Logistic regression was also performed to assess the additional impact of early childhood psychiatric disorders in the prediction of school-age SI (Table 5). After controlling for early-childhood psychiatric disorders, early-childhood SI was the strongest predictor of school-age SI ($OR = 3.85$). Early-childhood ODD/CD was also a significant predictor of school-age SI ($OR = 3.04$). An additional model including the impact of school-age follow-up symptoms of psychopathology was analyzed. As shown in Table 5, the strongest predictor of school-age SI was early-childhood SI, with an odds ratio of 4.18. Not surprisingly, school-age depression was also a significant predictor of school-age SI ($OR = 3.43$). A final model included the impact of both early childhood and school-age disorders as predictors of school-age SI (Table 5). After controlling for both early-childhood and school-age psychiatric disorders, SI during ages 3–7 remained a predictor of school-age SI ($OR = 3.62$). In this model, both early childhood ODD/CD ($OR = 4.82$) and school-age depression ($OR = 3.34$) also remained significant predictors of school-age SI.

Exploratory Analysis—Given evidence for the intergenerational continuity of SI in related literature, we explored whether the presence of maternal psychopathology, maternal suicide attempts, or history of suicide attempts in first-/second-degree relatives was predictive of school-age SI. Maternal psychopathology was strongly related to school-age SI

($\chi^2 = 13.26$; $p < .001$). Specifically, maternal bipolar ($\chi^2 = 12.29$; $p < .001$), anxiety ($\chi^2 = 4.89$; $p < .05$), substance abuse ($\chi^2 = 15.60$; $p < .001$), and CD ($\chi^2 = 11.30$; $p < .001$) were related to school-age SI. Much like early-childhood SI, there was no relation between maternal history of suicide attempts ($\chi^2 = 2.68$; $p = .10$) or suicide attempts in first-/second-degree relatives and school-age SI ($\chi^2 = 0.20$, $p = .65$).

DISCUSSION

This study provides evidence to inform the correlates and school-age consequences of SI occurring during ages 3–7 from a longitudinal study of early childhood depression. SI was present in approximately 11% ($n = 34$) of young children in this sample enriched for early childhood depression and other forms of psychopathology, and 75% ($n = 25/34$) of these youth continued to endorse SI at the school-age follow-up assessment. Early-childhood SI was more common among boys and highly associated with a variety of maternal psychopathology, but not maternal or family history of suicide attempts. Early childhood SI was associated with concurrent ADHD and ODD/CD, after controlling for the presence of other symptoms and relevant demographic covariates. Notably, traumatic life events were not a predictor of early-childhood SI. Results indicate that early-childhood SI is a significant and robust predictor of school-age SI, as children reporting SI between ages 3–7 were over three times more likely to continue reporting SI later in childhood, even after controlling relevant demographic variables, psychiatric disorders in early childhood, and school-age psychiatric disorders. This finding extends existing research on early childhood SI by demonstrating that SI occurring during ages 3–7 confers significant risk for continuation into the school-age period, particularly alongside early ODD/CD.

Study findings are consistent with and extend extant research on SI in later childhood, suggesting that this clinical phenomenon may be equally valid in younger children. For example, evidence of heightened SI among young boys mirrors findings among older children and adolescents³. This finding extends these results into a younger age range, suggesting some similarity between early childhood SI and SI in later childhood and adolescence. Maternal history of psychopathology, but not maternal or family history of suicide attempts specifically, was also found to be associated with early-childhood SI. In other work, however, maternal and/or family history of suicide attempts does predict SI in older children and adolescents⁴. Our results indicate that perhaps during younger ages, the influence of maternal or family history of suicide attempts is not as strong as the more general influence of family history of psychopathology. Alternatively, maternal and/or family history of suicide attempts were infrequently reported in our sample (n 's = 21 and 80, respectively), and therefore, this finding could simply reflect a lack of power to detect such findings. Maternal psychopathology may also impact parenting practices, leading to enhanced risk for poor child outcomes⁴⁶. Additional work is needed in younger samples to further delineate the influences of family history of suicide attempts and psychopathology in general on early childhood SI and whether the strength of these influences may change across development.

Of particular interest, the present findings highlight the unique associations of early-childhood ADHD and ODD/CD with early-childhood SI. When controlling for other

symptoms and relevant demographic variables, early-childhood SI was concurrently associated with children's diagnoses of both ADHD and ODD/CD, but not depression or anxiety disorders. Thus, SI during early childhood exhibits some specificity to externalizing diagnoses and may not be a marker of general psychopathology. Indeed, emerging literature suggests that youth characterized by impulsivity and aggression may be particularly at risk for suicidal behaviors^{47–49}. Likewise, the inhibition that characterizes anxiety symptoms appears to be functioning as a protective factor. Future work should continue to explore these possibilities as well as whether diagnostic severity and/or comorbidity may influence a young child's risk for SI^{7,12}.

Longitudinal analyses revealed that early-childhood SI was a significant predictor of future school-age depression and ODD/CD. However, early-childhood SI did not remain a significant predictor of school-age disorders after controlling for children's baseline symptoms of the same pathology. This finding in young children extends other longitudinal work in older children and adolescents, suggesting that a large part of the association between early-childhood SI and later psychopathology is due to high levels of internalizing and externalizing pathology during early childhood⁸. Alternatively, only children with psychiatric diagnoses endorsed SI; therefore, there may not have been enough variability across time to detect a significant association, particularly when other demographic and clinical variables were included in the models and given that a portion of this sample was originally recruited based on the presence of mood symptoms.

The present findings underscore the clinical significance of SI during ages 3–7 as an early marker of risk for ongoing SI. In this study, school-age SI was predicted by early-childhood SI. Young children with SI were over three times more likely to continue to have school-age SI, even after controlling for past and current psychiatric diagnoses, demographic variables, and maternal psychopathology. In these models, both early-childhood ODD/CD and school-age depression also conferred greater risk for school-age SI. This suggests some level of homotypic continuity in these behaviors from early to middle childhood, establishing an earlier developmental starting point to the well-documented trajectory of SI from school-age into adolescence/adulthood^{29,50}. As such, although a more nuanced understanding of death and suicide^{16,17,20} likely develop over middle childhood, the present findings suggest that young children's reports of SI may correspond to those same behaviors at school-age, providing indirect evidence of continuity across time. Despite these findings and a growing body of developmental work, it remains unclear exactly what a young child means when he/she says that they want to die or harm themselves, and a conceptual understanding of death was not tested in the current study. Yet, data indicate that death/suicidal statements, behaviors, and actions among young children are strongly associated with distress and psychopathology as well as later suicidal ideation at school age, underscoring the need to attend to this symptom as an important marker of risk. Although the understanding of death and suicide may change, SI may serve as a signal of clinical distress and impairment across age groups.

Notably however, no associations with traumatic life events were found. Furthermore, larger nonclinical, community-based samples of young children that are fully assessed for SI will help elucidate what (if any) aspects of childhood SI are normative and at what level these

symptoms become clinically impairing or predictive of later negative outcomes. Children exhibiting SI during ages 3–7 may be at high risk to maintain or possibly intensify their SI across time, particularly combined with the presence of early-onset ODD/CD. This group of young children represents a group that is at high risk for negative outcomes, such as suicide attempts and severe psychopathology, and should be targeted for early intervention. These findings suggest that clinicians should assess for the presence of SI in young children with ADHD and/or ODD/CD—a domain that has been clinically neglected in this age group to date.

Although not the primary purpose of this report, we also explored potential correlates and school-age outcomes of persistent death and suicidal themes present in the play of children ages 3–7. Results suggest that persistent death and suicidal themes in play are concurrently associated with increased rates of early childhood depression, ADHD, and ODD/CD. Furthermore, young children with persistent death and suicidal themes in their play were also more likely than children not endorsing these play themes/SI to meet criteria for depression and anxiety disorders during school age. Although our base rate for these behaviors occurring without other SI items was low ($n = 14$), these preliminary findings offer evidence suggesting that persistent death and suicidal themes in play may be indicative of general distress and psychiatric impairment that may continue into school-age.

The most salient limitation of this study was the relatively small number of young children endorsing childhood SI. Although this variable is expected to have a low base rate of occurrence, future work may be strengthened by including larger sample sizes to capture more variability and endorsement of SI in this age range. Young children in this study were recruited based on high endorsement of symptoms of depression; therefore, prevalence rates may be higher than would be expected for a less clinically-enriched sample. The SI information collected from the study relied primarily on parent-report—a method with several known shortcomings, including reporter bias⁵¹. This study is also complicated by the possibility that the meaning of SI changes over the course of development; we know that understanding of death develops over childhood²⁰, and it is difficult to know what a young child means with his/her suicidal expressions and actions. Nevertheless, most empirical data suggest that young children have acquired some understanding of death^{17,20} and fear of death⁵² by this age. Of note, specific life experiences (e.g., religion, education, death, and suicide) have been found to hasten an understanding of death in young children^{16,36}. It is possible that adverse life experiences and/or psychopathology likewise increase children's understanding of the meaning of death and suicide. It may also be that an understanding of death and suicide in young children depends on how such information is presented and who is delivering the information (e.g. caregiver versus another child). This remains an open question for future inquiry. This study is also limited by inability to assess the genetic contributions of SI from parents to children. Given the strong evidence linking parental suicide attempts and psychopathology to offspring SI⁴, future work would benefit from including genetic assessments of inherited liability to psychopathology and/or impulsivity. Young children in this sample were recruited from the general community, and therefore, we could not control for any outside treatment that these children received throughout the study.

The continuity of SI throughout childhood reported here should inform prevention and treatment efforts. Given that school-age children experience an increase in the means to carry out suicide as well as exposure to additional risk factors correlated with suicide attempts, this group of children who had SI during ages 3–7 may be at increased risk. Furthermore, the present findings provide additional support for the independent association between ODD/CD and SI among young children. Evidenced-based practices for disruptive behavior disorders may be particularly beneficial for these children and help to moderate the association between early and later childhood SI. In addition, pending replication of this work, suicide risk prevention programs may benefit by incorporating skills focused on reducing the impact of externalizing disorders. Such early intervention, particularly during early childhood, may offer a crucial window of opportunity to alter the trajectory of SI across childhood.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Frequency Rates of Suicidal Cognitions and Behavior in the Study Sample: Baseline and Follow-Up

		Frequency of Endorsement During Ages 3–7 (<i>n</i> = 306)	Frequency of Endorsement School-Age (<i>n</i> = 274)
Questions from the PAPA/CAPA	Persistent death/suicidal themes in play only	14	----
		Age 4–3	
		Age 5–5	
		Age 6–6	
	Persistent thoughts about death/dying and/or suicide (without play)	28	39
		Age 3–1	
		Age 4–7	
		Age 5–11	
		Age 6–9	
	Suicidal plans and intent	4	13
		Age 4–1	
		Age 6–3	
	Suicidal behavior and/or attempts	5	3
		Age 3–2	
		Age 4–2	
		Age 5–1	
	Mild impairment	28	36
		Age 3–7	
		Age 4–7	
		Age 5–5	
		Age 6–9	
	Moderate impairment	11	
		Age 3–1	
		Age 4–3	
		Age 5–3	
		Age 6–4	
	Severe impairment	3	
		Age 3–1	
		Age 4–2	
CDI item	Item 9: I think about killing myself	----	26

Note: CAPA = Child and Adolescent Psychiatric Assessment; CDI = Children's Depression Inventor; PAPA = Preschool Age Psychiatric Assessment; PECFAS = Preschool and Early Childhood Functional Assessment Scale.

Table 2

Demographic Characteristics of Participants at Baseline

	No SI During Ages 3–7 (<i>n</i> = 258)	SI During Ages 3–7 (<i>n</i> = 34)	Statistic
<i>Demographics</i>			
Gender (% male)	50	67	$\chi_{(1)}^2 = 3.93^*$
Age, mean (SD)	5.33 (0.83)	5.47 (1.03)	$t_{(304)} = -0.90$
Age at follow-up, mean (SD)	9.52 (0.89)	9.90 (0.72)	$t_{(221)} = -1.81$
Income-to-needs ratio, mean (SD)	2.07 (1.09)	1.71 (1.10)	$t_{(301)} = 1.77$
Traumatic life events, mean (SD)	3.46 (3.67)	5.24 (6.40)	$t_{(300)} = -1.56$
<i>Maternal Psychopathology (% present)</i>			
Maternal history of suicide attempts	7	9	$\chi_{(1)}^2 = 0.26$
Maternal depression	37	57	$\chi_{(1)}^2 = 5.12^*$
Maternal bipolar	5	12	$\chi_{(1)}^2 = 1.81$
Maternal anxiety	11	30	$\chi_{(1)}^2 = 7.83^{**}$
Maternal ADHD	3	3	$\chi_{(1)}^2 = 0.00$
Maternal substance abuse	5	15	$\chi_{(1)}^2 = 4.93^*$
Maternal CD	4	12	$\chi_{(1)}^2 = 4.70^*$
Maternal total number of diagnoses, mean (SD)	0.76 (1.02)	1.45 (1.03)	$t_{(300)} = -3.66^{***}$
1 st or 2 nd degree relative with a history of suicide attempts	26	27	$\chi_{(1)}^2 = 0.28$
<i>Early Childhood Psychopathology (ages 3–7; % present)</i>			
Depression diagnosis	36	76	$\chi_{(1)}^2 = 17.70^{***}$
ADHD	18	64	$\chi_{(1)}^2 = 33.40^{***}$
ODD/CD diagnosis	31	79	$\chi_{(1)}^2 = 27.99^{***}$
PTSD diagnosis	5	6	$\chi_{(1)}^2 = 0.08$
Anxiety diagnosis	32	59	$\chi_{(1)}^2 = 9.27^{**}$

Note: Means and standard deviations are presented for continuous variables. ADHD = attention-deficit/hyperactivity disorder; CD = conduct disorder; PTSD = posttraumatic stress disorder; ODD = oppositional defiant disorder.

*
 $p < .05$,

**
 $p < .01$,

 $p < .000$

Logistic Regression Analyses Examining Unique Concurrent Associations Between Early Childhood Psychiatric Disorders and Suicidal Cognitions and Behaviors

Table 3

	B	SE	Wald	df	p	OR	95% CI for OR
							Lower Upper
<u>Examining unique concurrent associations with early childhood depression</u>							
Age	.36	.17	4.55	1.00	.03	1.43	1.03 1.99
Gender (M)	.05	.28	.03	1.00	.85	1.05	.61 1.82
Income-to-needs ratio	.05	.13	.15	1.00	.70	1.05	.81 1.36
Maternal psychopathology	.74	.28	6.82	1.00	.01	2.09	1.20 3.63
SI during ages 3–7	.72	.51	1.96	1.00	.16	2.05	.75 5.61
Early-childhood ADHD	.99	.36	7.56	1.00	.01	2.69	1.33 5.43
Early-childhood ODD/CD	.97	.31	9.95	1.00	.00	2.64	1.44 4.82
Early-childhood anxiety disorders	.83	.29	8.23	1.00	.00	2.29	1.30 4.04
Constant	−3.76	1.00	14.26	1.00	.00	.02	
<u>Examining unique concurrent associations with early childhood ADHD</u>							
Age	−.21	.20	1.08	1.00	.30	.81	.54 1.21
Gender (M)	−.52	.34	2.32	1.00	.13	.59	.30 1.16
Income-to-needs ratio	−.16	.15	1.15	1.00	.28	.85	.63 1.15
Maternal psychopathology	.58	.36	2.67	1.00	.10	1.79	.89 3.62
SI during ages 3–7	.98	.49	4.01	1.00	.05	2.68	1.02 7.01
Early-childhood depression	.98	.37	7.12	1.00	.01	2.66	1.30 5.47
Early-childhood ODD/CD	1.73	.36	23.60	1.00	.00	5.63	2.80 11.32
Early-childhood anxiety disorders	.73	.35	4.38	1.00	.04	2.07	1.05 4.11
Constant	−1.60	1.15	1.92	1.00	.17	.20	
<u>Examining unique concurrent associations with early childhood ODD/CD</u>							
Age	−.21	.18	1.44	1.00	.23	.81	.57 1.14
Gender (M)	−.37	.29	1.65	1.00	.20	.69	.39 1.22
Income-to-needs ratio	−.22	.13	2.77	1.00	.10	.80	.62 1.04
Maternal psychopathology	.26	.30	.77	1.00	.38	1.30	.72 2.34

	B	SE	Wald	df	p	OR	95% CI for OR
							Lower Upper
SI during ages 3–7	1.04	.52	3.98	1.00	.05	2.83	1.02 7.85
Early-childhood depression	.94	.31	9.44	1.00	.00	2.57	1.41 4.70
Early-childhood ADHD	1.74	.35	24.05	1.00	.00	5.69	2.84 11.40
Early-childhood anxiety disorders	.29	.31	.83	1.00	.36	1.33	.72 2.46
Constant	.03	.98	.00	1.00	.98	1.03	

Examining unique concurrent associations with early childhood anxiety disorders							
Age	.23	.16	2.16	1.00	.14	1.26	.93 1.72
Gender (M)	.31	.27	1.30	1.00	.25	1.36	.80 2.30
Income-to-needs ratio	.13	.12	1.10	1.00	.30	1.14	.89 1.45
Maternal psychopathology	.10	.28	.13	1.00	.72	1.11	.64 1.92
SI during ages 3–7	.44	.43	1.03	1.00	.31	1.55	.66 3.64
Early-childhood depression	.83	.29	8.18	1.00	.00	2.28	1.30 4.02
Early-childhood ADHD	.81	.34	5.67	1.00	.02	2.26	1.15 4.42
Early-childhood ODD/CD	.27	.31	.73	1.00	.39	1.31	.71 2.41
Constant	–3.08	.94	10.80	1.00	.00	.05	

Note: ADHD = attention-deficit/hyperactivity disorder; CD = conduct disorder; ODD = oppositional defiant disorder; SI = suicidal cognitions and behaviors.

Table 4
Logistic Regression Analyses Predicting School-Age Disorders From Early Childhood Suicidal Ideation

	B	SE	Wald	df	p	OR	95% CI for OR
							Lower Upper
Predicting school-age depression without controlling for early childhood baseline disorders							
Age	.52	.19	7.50	1.00	.01	1.68	1.16 2.42
Gender (male)	-.23	.31	.55	1.00	.46	.79	.43 1.47
Income-to-needs ratio	-.28	.16	3.00	1.00	.08	.76	.55 1.04
Maternal psychopathology	.83	.32	6.54	1.00	.01	2.29	1.21 4.32
SI during ages 3–7	1.19	.55	4.68	1.00	.03	3.28	1.12 9.65
Constant	-5.60	1.83	9.40	1.00	.00		
Predicting school-age ADHD without controlling for early childhood baseline disorders							
Age	.09	.20	.22	1.00	.64	1.10	.75 1.62
Gender (male)	-.64	.34	3.56	1.00	.06	.53	.27 1.03
Income-to-needs ratio	-.29	.17	3.12	1.00	.08	.74	.54 1.03
Maternal psychopathology	.67	.35	3.65	1.00	.06	1.96	.98 3.89
SI during ages 3–7	1.00	.52	3.64	1.00	.06	2.72	.97 7.58
Constant	-1.66	1.89	.77	1.00	.38	.19	
Predicting school-age ODD/CD without controlling for early childhood baseline disorders							
Age	.05	.20	.06	1.00	.80	1.05	.71 1.55
Gender (male)	-1.00	.35	8.16	1.00	.00	.37	.18 .73
Income-to-needs ratio	-.12	.17	.48	1.00	.49	.89	.64 1.24
Maternal psychopathology	.85	.36	5.62	1.00	.02	2.33	1.16 4.70
SI during ages 3–7	1.15	.53	4.70	1.00	.03	3.15	1.12 8.88
Constant	-1.53	1.90	.65	1.00	.42	.22	
Predicting school-age anxiety disorders without controlling for early childhood baseline disorders							
Age	.22	.17	1.70	1.00	.19	1.25	.89 1.75
Gender (male)	-.01	.29	.00	1.00	.97	.99	.56 1.76
Income-to-needs ratio	-.07	.15	.22	1.00	.64	.93	.69 1.25

	B	SE	Wald	df	p	OR	95% CI for OR	Lower	Upper
Maternal psychopathology	.63	.30	4.31	1.00	.04	1.87	1.04	3.38	
SI during ages 3–7	.84	.52	2.61	1.00	.11	2.31	.84	6.37	
Constant	–2.91	1.65	3.10	1.00	.08	.05			
Predicting school-age depression after controlling for early childhood baseline depression									
Age	.49	.20	6.23	1.00	.01	1.64	1.11	2.41	
Gender (male)	–.20	.33	.37	1.00	.54	.81	.42	1.57	
Income-to-needs ratio	–.28	.17	2.73	1.00	.10	.76	.54	1.05	
Maternal psychopathology	.66	.34	3.71	1.00	.05	1.94	.99	3.80	
SI during ages 3–7	.83	.57	2.08	1.00	.15	2.29	.74	7.06	
Early childhood depression	1.51	.33	20.55	1.00	.00	4.55	2.36	8.75	
Constant	–5.99	1.92	9.74	1.00	.00	.00			
Predicting school-age ADHD disorder after controlling for early childhood baseline ADHD									
Age	.10	.21	.24	1.00	.63	1.11	.74	1.66	
Gender (male)	–.46	.36	1.61	1.00	.20	.63	.31	1.28	
Income-to-needs ratio	–.23	.18	1.62	1.00	.20	.80	.56	1.13	
Maternal psychopathology	.47	.37	1.56	1.00	.21	1.59	.77	3.31	
SI during ages 3–7	.58	.58	1.00	1.00	.32	1.78	.57	5.50	
Early childhood ADHD	1.72	.38	21.04	1.00	.00	5.59	2.68	11.67	
Constant	–2.30	2.01	1.31	1.00	.25	.10			
Predicting school-age ODD/CD after controlling for early childhood baseline ODD/CD									
Age	.15	.22	.45	1.00	.50	1.16	.75	1.80	
Gender (male)	–.86	.38	5.05	1.00	.02	.42	.20	.90	
Income-to-needs ratio	.01	.19	.00	1.00	.98	1.01	.70	1.45	
Maternal psychopathology	.66	.39	2.84	1.00	.09	1.93	.90	4.13	
SI during ages 3–7	.64	.57	1.24	1.00	.27	1.90	.61	5.84	
Early childhood ODD/CD	2.04	.38	28.21	1.00	.00	7.67	3.62	16.26	
Constant	–3.60	2.17	2.74	1.00	.10	.03			
Predicting school-age anxiety disorders after controlling for early childhood baseline anxiety disorders									

	B	SE	Wald	df	p	OR	95% CI for OR	
							Lower	Upper
Age	.20	.18	1.26	1.00	.26	1.22	.86	1.72
Gender (male)	.00	.30	.00	1.00	1.00	1.00	.55	1.81
Income-to-needs ratio	-.04	.16	.05	1.00	.82	.97	.71	1.31
Maternal psychopathology	.61	.31	3.90	1.00	.05	1.84	1.00	3.38
SI during ages 3–7	.66	.53	1.55	1.00	.21	1.94	.68	5.52
Early childhood anxiety disorders	.99	.31	10.42	1.00	.00	2.70	1.48	4.92
Constant	-3.09	1.70	3.30	1.00	.07			

Note: ADHD = attention-deficit/hyperactivity disorder; CD = conduct disorder; ODD = oppositional defiant disorder; OR = odds ratio; SI = suicidal cognitions and behaviors.

Table 5

Logistic Regression Predicting the Likelihood of School-Age Suicidal Ideation

	B	SE	Wald	df	p	OR	95% CI for OR
							Lower Upper
Before Controlling for Disorders at Early Childhood Baseline							
Age	.03	.20	.02	1.00	.88	1.03	.69 1.54
Gender (male)	-.14	.35	.16	1.00	.69	.87	.44 1.72
Income-to-needs ratio	-.38	.17	4.85	1.00	.03	.68	.49 .96
Maternal psychopathology	.56	.36	2.35	1.00	.12	1.74	.86 3.54
SI during ages 3–7	1.76	.55	10.32	1.00	.00	5.79	1.98 16.90
Constant	-1.22	1.96	.39	1.00	.53	.30	
After Controlling for Early Childhood Disorders							
Age	.08	.21	.14	1.00	.70	1.08	.71 1.64
Gender (male)	.06	.37	.03	1.00	.87	1.06	.51 2.21
Income-to-needs ratio	-.33	.18	3.28	1.00	.07	.72	.50 1.03
Maternal psychopathology	.34	.38	.80	1.00	.37	1.41	.66 2.99
Early-childhood depression	.74	.40	3.34	1.00	.07	2.09	.95 4.61
Early-childhood ADHD	.33	.43	.59	1.00	.44	1.39	.60 3.22
Early-childhood ODD/CD	1.12	.40	7.73	1.00	.01	3.06	1.39 6.73
Early-childhood anxiety disorders	-.69	.42	2.65	1.00	.10	.50	.22 1.15
SI during ages 3–7	1.35	.58	5.34	1.00	.02	3.84	1.23 12.02
Constant	-2.45	2.08	1.39	1.00	.24	.09	
After Controlling for School-Age Disorders							
Age	-.16	.22	.50	1.00	.48	.85	.55 1.33
Gender (male)	.12	.39	.10	1.00	.75	1.13	.53 2.41
Income-to-needs ratio	-.32	.19	3.00	1.00	.08	.72	.50 1.04
Maternal psychopathology	.19	.39	.23	1.00	.63	1.21	.56 2.62
School-age depression	1.23	.43	8.23	1.00	.00	3.43	1.48 7.97
School-age ADHD	.53	.42	1.61	1.00	.20	1.70	.75 3.85
School-age ODD/CD	.55	.43	1.63	1.00	.20	1.73	.74 4.04

	B	SE	Wald	df	p	OR	95% CI for OR
							Lower Upper
School-age anxiety disorders	.09	.41	.05	1.00	.82	1.10	.49 2.46
SI during ages 3–7	1.43	.58	6.09	1.00	.01	4.18	1.34 13.04
Constant	-.31	2.12	.02	1.00	.89	.74	
After Controlling for Early Childhood and School-Age Disorders							
Age	-.08	.23	.11	1.00	.74	.93	.59 1.46
Gender (male)	.17	.40	.18	1.00	.67	1.18	.54 2.59
Income-to-needs ratio	-.30	.19	2.49	1.00	.11	.74	.51 1.08
Maternal psychopathology	.14	.41	.11	1.00	.74	1.15	.52 2.54
Early-childhood depression	.35	.44	.61	1.00	.43	1.42	.59 3.38
Early-childhood ADHD	.19	.46	.18	1.00	.67	1.21	.49 2.97
Early-childhood ODD/CD	1.04	.45	5.39	1.00	.02	2.82	1.17 6.78
Early-childhood anxiety disorders	-.86	.45	3.55	1.00	.06	.42	.17 1.04
School-age depression	1.21	.44	7.45	1.00	.01	3.34	1.40 7.93
School-age ADHD	.48	.46	1.09	1.00	.30	1.61	.66 3.98
School-age ODD/CD	.15	.48	.10	1.00	.75	1.16	.46 2.97
School-age anxiety disorders	.17	.43	.16	1.00	.69	1.19	.51 2.78
SI during ages 3–7	1.29	.59	4.76	1.00	.03	3.62	1.14 11.49
Constant	-1.41	2.22	.40	1.00	.53	.24	

Note: ADHD = attention-deficit/hyperactivity disorder; CD = conduct disorder; ODD = oppositional defiant disorder; OR = odds ratio; SI = suicidal cognitions and behaviors.