

Parent-adolescent agreement about adolescent's suicidal ideation and behavior in relation to  
adolescent's one-year depressive symptoms, and suicide-related outcomes

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### Abstract

The present study has two aims: (1) to examine parent-adolescent baseline agreement regarding adolescent past year suicidal ideation and suicide attempts in relation to adolescent self-reported and suicidal ideation at baseline; and (2) to study the extent to which this baseline agreement about adolescents past year suicidal ideation/behavior predicts suicidal ideation, depressive symptoms and the likelihood of suicide attempts 12-month follow-up. A total of 448 adolescents, ages 13 to 17 years, were recruited from two psychiatric hospitals and followed for one year. All analysis controlled for the effect of gender, history of multiple attempts, parents' history of mental health problems, and other important clinical variables. Results indicated that parents' awareness of adolescents' past year suicide attempts was related to significant lower baseline suicidal ideation in adolescents; while parent-adolescent agreement about adolescents' past year suicidal ideation was related to significant higher baseline and 12 month suicidal ideation. Girl tended to have significantly higher baseline depressive symptoms if their parents were aware of the past year suicidal ideation. Perceived family support fully mediated the relationship between agreement on past year suicidal attempts and adolescents' baseline suicidal ideation. These findings demonstrate that parents might be more likely to intervene when they detected suicidal behaviors, instead of suicidal ideation. In addition, family support seemed to be the pathway that accounts for the relationship between agreement and suicidal ideation. This study highlights the benefits of parental involvement in the treatment of suicidal adolescents. In families where parents lack awareness about their children's suicidal ideation and suicide attempts, intervention programs should aim to enhance communication between parents and children to decrease potential of these negative outcomes.

*Keywords: agreement, suicidal ideation, suicide attempts, depressive symptoms*

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Adolescent suicide is a significant, global public health problem (Wasserman, Cheng, & Jiang, 2005). In the United States, the prevalence for suicide attempts rises dramatically during adolescence (13-17 years old), making suicide the second leading cause of death in this age group (Centers for Disease Control and Prevention, 2009). A national survey has indicated that 4 out of 100,000 adolescents between ages 10 to 17 had died by suicide (Centers for Disease Control, & Prevention, 2009<sup>2</sup>). Among adolescent suicide attempters, the rates are particularly high among those with depressive disorders. Rotheram-Borus and Paul (1988) found that 42% of adolescent suicide attempters were diagnosed with major depressive disorder or an adjustment disorder with depressed mood. Suicidal ideation and behaviors not only bring distress to adolescents and their families, but often lead to chronic psychosocial impairments. Many studies have been conducted to delineate the risk factors related to adolescent suicide (e.g., Bolton, Pagura, Enns, Grant, & Sareen, 2010; Brådvik & Berglund, 2009; Winfree & Jiang, 2010).

Although it is widely acknowledged that low agreement between different informants (e.g., parents, adolescents, teachers) regarding psychopathology in children and adolescents is quite common (Cantwell, Lewinsohn, Rohde, & Seeley, 1997; Costello, Dulcan, Conover, & Kala, 1986; Ferdinand, van der Ende & Verhulst, 2004; Herjanic & Reich, 1997; Seiffge-Krenke & Kollmar, 1998; Edelbrock,), only a few researchers have focused on agreement regarding adolescents' suicidal ideation and suicidal behaviors, between parents and children (Brent, Kalas, Edelbrock, Costello, Dulcan, & Conover, 1986; Klaus, Mobilio & King, 2009; Velting, Shaffer, Gould, Garfinkel, Fisher, & Davies, 1998; Wagner & Cohen, 1994). In one study, Klaus and

colleagues (2009) found that 37% of parents were unaware of recent adolescent-reported (within one month) suicidal thoughts and 59% were unaware of adolescent reported suicide plans. These results are consistent with previous findings that agreement between parents and adolescents regarding adolescents' self-harming behaviors is low (Breton, Tousignant, Bergeron, & Berthiaume, 2002; Sourander, Aromaa, Pihlakoski, Haavisto, Rautava, Helenius, & Sillanpää, 2006). For example, one study of 13-year-old girls and boys ( $n = 17$ ) reported that not a single deliberate self-harm case was identified by the parents; at age 16, only six out of 38 (16%) girls with deliberate self-harm behaviors had been identified by their parents, only two out of nine (22%) self-harmed boys were identified (Sourander, et al., 2006). Furthermore, Breton and colleagues (2002) found that almost 90% of parents were not aware of their adolescents' suicidal ideation and 95% were not aware of their adolescents' suicide attempts.

A number of studies have investigated the relationship between parent-adolescent agreement about psychopathology and depressive outcomes in adolescents. In one study, depressed youth were less likely to describe communications with their parents as open or positive, and youth reporting more impaired communication were at higher risk for future risk behaviors, such as drug use and non-protective sexual behaviors (Yu, mens, Yang, Li, Stanton, Deveaux, & Harris, 2006). Moretti and colleagues (1985) reported that although children diagnosed with major depression reported significantly more severe depressive symptoms than children who received other psychiatric diagnoses, their parents' reports did not reflect such difference. The discordance between parent-adolescent dyads in perceptions of adolescent suicidal behaviors and emotions, has been found to be related with the presence of depression in African American adolescents (Breland & Weller, 2011). These findings are consistent with two longitudinal studies reporting that discrepancies in agreement between parents and adolescents

regarding adolescents' suicidal ideation and behavior predict poor outcomes such as drug use, police/legal contacts and expulsion from schools or jobs later in these adolescents' lives (Ferdinand, van der Ende & Verhulst, 2004; Ferdinand, van der Ende & Verhulst, 2006). In particular, Ferdinand and colleagues (2004) found, in a sample of adolescents ages 15 to 18 year, that the discrepancy in parent and adolescent agreement regarding the adolescent's psychopathology, especially when adolescents reported considerably more emotional problems than their parents, was associated with a higher risk of persistent emotional problems (such as depression and anxiety) in young adulthood.

Previous studies have reported inconsistent findings regarding the relationship between parent-adolescent discrepancy on adolescents' psychopathology and adolescent suicide related outcomes. One study investigating parent-teacher agreement of youth's psychopathology reported that youth whose parents and teachers had more discrepancies about aggressive behaviors, tended to engage in more self-harm and suicide attempts (Ferdinand, Van Der Ende, & Verhulst, 2006). Another community-based study, investigating the agreement between adolescents (15 to 18 years old) and their parents, found that disagreement regarding ratings of adolescents' psychopathology did not predict the development of suicidal ideation in adolescents when they reached young adulthood (Ferdinand, Van Der Ende & Verhulst, 2004). However, the same study found that parent-adolescent discrepancy on the social problem scale of the Youth Self-Report (YSR) was significantly related to more suicide attempts in adolescents. Nevertheless, the generalizability of these results, taken from community and school based studies, may not apply to psychiatrically hospitalized adolescents. Hospitalized adolescents may not only experience more severe symptoms but also share a different communication pattern with their parents compared to teens from the general population. For example, King and colleagues

(1993) found that hospitalized suicidal adolescents are less likely to communicate as well with their fathers compared to non-suicidal hospitalized adolescents.

### **Moderators and Mediator**

Several factors have been found to moderate and mediate the relationship between parent-adolescent agreement in regards to adolescents' psychopathology, including suicidal ideation and behaviors, and the mental health outcomes in adolescents. Moderators include adolescent's gender, parental mental status, and adolescent's history of multiple suicidal attempts; one mediator is adolescents' perceived family support (Grills & Ollendick, 2003; Klaus, Andrea & King, 2009; Kolko & Kazdin, 1993).

**Gender as a moderator.** In general, studies have shown that adolescent boys tend to agree more regarding their psychopathology with their parents (Angold, Weissman, John, Merikancas, Prusoff, Wickramaratne, Gammon, and Warner, 1987; Rapee, 1994; Sourander, Helstelä, & Helenius, 1999; Thompson, Merritt, Keith, Murphy, & Johndrow, 1993), although some studies have not found a relationship between gender and level of agreement about adolescents' major psychiatric disorders between parents and their children (Cantwell, et al., 1997). To our knowledge, few studies have investigated the potential moderation effect of gender on parent-adolescent agreement and emotional or behavior outcomes in adolescents. One of these studies found gender did not moderate this relationship (Cantwell, et al., 1997). Nevertheless, male and female do have many differences in psychopathology symptoms. For example, adolescent girls were found to have a significantly higher level of distress than adolescent boys in most symptom domains (Sourander, Helstelä, & Helenius, 1999) and female gender at age 12 predicted self-reported acts of deliberate self-harm 3 years later (Sourander, et al., 2006).

**Parents' mental health history as a moderator.** There are inconsistent findings regarding the relationship between parents' mental health history and parent-adolescent agreement. Some studies found that parents' history of depression is associated with significantly higher agreement about suicidal ideation between parents and adolescents (Klaus, Andrea, and Cheryl, 2009; Phares, Compas, & Howell, 1989). However, one study reported that higher levels of maternal stress and depressive symptoms predicted increased discrepancies between caregiver and male adolescent reports of both internalizing and externalizing behaviors (Jensen, Traylor, Xenakis, & Davis, 1988). Another study found mothers' depressive symptoms are related to mother-child discrepancies in reports of children's internalizing, but not externalizing, behaviors (Kolko & Kazdin, 1993). However, the differences in these findings could be due to the fact of suicidal ideation which Klaus, et al. (2009) and Phares, et al. (1989) have focused on as opposed to other psychopathology. Even though parents' history of psychopathology was inconsistently associated with parent-adolescent discrepancy in ratings, parents' history of psychopathology was consistently reported to be related to harmful mental health outcomes in adolescents. More specifically, Rothen and colleagues (2009) found similar results in that parents with a history of major depressive disorder (MDD) tended to report more MDD symptoms in their children.

**Adolescents' multiple suicide attempts as a moderator.** Multiple suicide attempters suffer more severe suicide related symptoms compared to single suicide attempters (Forman, Berk, Henriques, Brown, & Beck, 2004; Michaelis, Goldberg, Singer, Garno, Ernst, & Davis, 2003; Rosenberg, Jankowski, Sengupta, Wolfe, Wolford II, & Rosenberg, 2005; Rudd, Joiner, & Rajad, 1996). For example, multiple attempters have a greater degree of deleterious background characteristics, such as a history of family suicide. This group also tends to possess more psychopathology, such as more severe depression; they tend to have poorer interpersonal

relationship (Forman, et al., 2004). Furthermore, it has been found that multiple attempters are not only at risk for more current Axis I diagnoses, but they also have more chronic diagnoses (Michaelis, Goldberg, Singer, Garno, Ernst, & Davis, 2003). Klaus and colleagues (2009) found that adolescents' history of multiple suicide attempts was associated with greater disagreement about adolescents' suicide plan and suicide attempts.

**Perceived family support as a mediator.** Perceived social support has been found to be significantly associated with parent-adolescent discrepancies about adolescent's psychopathologies. In one study of nonpatient, outpatient, and inpatient children with and without a recent history of fire setting behavior, Kolko and colleagues (1993) found that family stress and low parental acceptance of the child were significant predictors of informant discrepancies. Another community based study reported that informants' ratings and their discrepancies between other informants' reports were related to parent-children relationships. More specifically, a greater perceived acceptance from parents is related with the parent-children discrepancies (Treutler & Epkins, 2003). Similarly, another study showed that parents who reported low conflict with their children tended to evidence better agreement about emotional and behavioral problems (Grills & Ollendick, 2003).

In addition, much has been written about the ability of social support to weaken the impact of psychosocial stress on physical and mental health (e.g., Cassel, 1976; Cobb, 1976). Previous studies have identified that adolescents who feel unsupported by others when they have a problem are more likely to experience suicidal ideation than those who feel supported when encountering a problem (Rigby & Slee, 1999). In addition, parent-family connectedness emerged in several studies as a protective factor for suicide attempts across gender and racial/ethnic groups (Borowsky, Marjorie, & Michael, 2001; Borowsky, Resnick, Ireland, & Blum, 1999;



Guião & Esparza, 1995; Rubenstein, Heeren, Housman, Rubin, and Stechler, 1989). Moreover, family support was found to decrease adolescent substance use behavior (Hawkins, Catalano, & Miller, 1992). One study found that an insufficient degree of bonding between children and parents increased the risk of adolescent problem behaviors, including abuse of alcohol and other drugs (Brook, Brook, Gordon, & Whiteman, 1990). Family support, but not peer support, was negatively correlated to depressive symptoms in adolescents (Barrera & Garrison-Jones, 1992; Stice, Ragan & Randall, 2004). Taken together, because of the significant relationship between perceived family support and parent-adolescent agreement about adolescents' psychopathology, it is possible that family support can act as a mediator between parent adolescent agreement and level of psychopathology in adolescents.

### **Present Study**

Only a small number of studies investigating parent-adolescent agreement about adolescents' suicidal ideation and behaviors have been completed in a hospital setting, with few exceptions (eg. Ferdinand, van der Ende & Verhulst, 2006; Klaus, Mobilio & King, 2009). Moreover, a longitudinal study investigating the effect of parent-adolescent agreement about suicidal ideation, suicidal behaviors, and other outcomes such as depressive symptoms is still lacking. With the knowledge that adolescents hospitalized for the reason of suicidal ideation and attempts may have different clinical features compared to suicidal adolescents in the community, the present study examines the relationship between parent-adolescent baseline agreement regarding adolescent past year suicidal ideation and behavior, as well as several short-term and long-term adverse outcomes, in an inpatient sample. This study has four aims:

1. To examine the relationship between baseline parent-adolescent agreement about adolescent past year suicidal ideation and attempts with adolescents' depressive symptoms and suicidal ideation at baseline.

2. To study the extent to which the baseline agreements about adolescents' past year suicidal ideation and attempts predicts suicide attempts, as well as the depressive symptoms and suicidal ideation at 12-month follow-up.

3. To determine whether parent-adolescent agreement about depressive symptoms and suicidal ideation, will be moderated by: (1) adolescents' gender, (2) parents' mental health history, and (3) adolescents' history of multiple suicidal attempts, both at baseline and 12-month follow-up.

4. To determine whether perceived family support mediates the relationship between parent-adolescent agreement and adolescents' depressive symptoms as well as suicidal ideation outcomes, both at baseline and 12-month follow-up; and the risk for actual suicide attempts during the 12-month period.

## **Method**

### **Participants**

Data for this study are part of a larger study investigating the efficacy of the Youth-Nominated Support Team-II intervention with suicidal adolescents (King, Klaus, Kramer, Venkataraman, Quinlan, & Gillespie, 2009). A total of 448 adolescents, ages 13 to 17 years, were recruited from two psychiatric hospitals and followed for one year. Adolescents with either self-reported or parent-reported recent serious suicidal ideation or suicide attempts (both within four weeks) were included in the study. Adolescents were excluded if they had severe cognitive impairment (unable to provide informed assent), were directly transferred to a medical unit or a

residential placement, lived more than one hour drive to the hospital, and lacked a legal guardian at the time of interview. The whole sample was composed of 28.8% male adolescents ( $n = 129$ ) and the average age of the participants was 15.6 years ( $SD = 1.31$ ). The racial distribution of the sample was: 83.7% Caucasian, 6.5% African American, and 7.1% Other or not identified. The annual income of adolescents' families varied, from five percent of the families with an annual income of less than \$15,000, to sixteen percent of the families with an annual income of more than \$100,000. The median range of the annual family income was between \$40,000 and \$59,000.

### **Measures**

**Agreement about suicidal ideation and suicide attempts.** The suicidal ideation questions, drawn from the Diagnostic Interview Schedule for Children Version IV (DISC-IV; Shaffer, Fisher, Lucas, & NIMH DISC Editorial Board, 1998), were used to assess agreement between parents and adolescents. In particular, parents and adolescents were administered a version of DISC-IV independently and their answers to the following two questions were compared. (1) "Youth thought seriously about killing him/herself in last year?" (adolescents and parents answered yes/no/I don't know). The difference in answers for this question are indicators for agreement about suicidal ideation between parents and children. (2) "Youth has tried to kill him/herself in past year?" (adolescents and parents answered yes/no/I don't know). The difference in answers for this question are indicators for agreement about suicide attempt between parents and children.

**Suicide attempts.** The lifetime history of multiple suicide attempts at baseline, as well as the presence of suicide attempts within the 12-month follow-up period were assessed with suicide attempt items from Diagnostic Interview Schedule for Children Version IV (DISC-IV;

Shaffer, et al., 1998). The presence or absence of multiple suicide attempts during adolescents' lifespan was assessed with an item from the DISC-IV: "How many times in his/her whole life has the youth tried to kill his/herself?" Multiple suicide attempters were defined as individual who had two or more suicide attempts in his/her whole life. The presence or absence of suicide attempts after hospitalization was also assessed with an item from the DISC-IV: "Youth has ever (since hospital discharge) tried to kill him/herself?" (adolescents and parents answered yes/no/I don't know). We coded adolescents as having attempted suicide during the 12-month follow-up period if either the adolescent or the parent gave a positive answer to this question at least once among the three-month, six-month, and 12-month follow-up period.

**Suicidal ideation.** The severity of suicidal ideation at baseline and 12-month follow-up were assessed by the Suicidal Ideation Questionnaire-Junior (SIQ-JR; Reynolds, 1988). The SIQ - JR is a 15-item self-report questionnaire measures the frequency of a range of suicidal thoughts. The frequency was rated by a 7-items scale ranging from *I never had this thought* to *almost every day*. The total range of the scale ranges from 0 to 90; a higher score indicates more severe/frequent suicidal ideation. It has been reported to have high internal consistency reliability ( $r = 0.91$ ) and test-retest reliability ( $r = 0.89$ ; Reynolds & Mazza, 1999). One study (King, Hovey, Brand, & Ghaziuddin, 1997) reported that the baseline SIQ-JR score of adolescent psychiatric inpatients was a significant predictor of suicidal thoughts and attempts 6 months after hospital discharge. In addition, a regression analysis between SIQ - JR and Suicidal Behavior Interview (SBI) has supported the criterion-related validity of the SIQ- JR as a measure of current suicidal ideation (Reynolds & Mazza, 1999).

**Depressive symptoms.** Depressive symptoms at baseline and 12-month follow-up were assessed by the Children's Depression Rating Scale - Revised (CDRS-R; Poznanski & Mokros,

1996). The CDRS - R is a clinical-rated and semi-structured scale for assessing the severity of depression of children age 6 - 12 years (Poznanski, Grossman, Buchsbaum, Banegas, Freeman, & Gibbons, 1984). CDRS - R is divided into four major groups -- mood, somatic, subjective and behavior. Each major group contains 3 - 5 subgroups with 17 subgroups in total. Questions are rated either on 5-items scales or 7-items scales, range from 17 to 113, with higher total scores reflecting more severe depressive symptoms. The total score of the CDRS-R at the first interview was reported to be a significant indicator of a clinical diagnoses of depression (Poznanski, et al., 1984). In addition, the test-retest reliability of CDRS - R has been found to be high ( $r = .86$ ; Poznanski, et al., 1984).

**Parent's mental history.** The Family History Screen (FHS) is a brief screening measure that assesses information on 15 lifetime psychiatric disorders (Weissman, Wickramaratne, Adams, Wolk, Verdeli, & Olfson, 2000). Items identifying parents' mental history were used in this study. In particular, parents were identified as having a history of mental health problem if they provided a positive response to the two questions asking if the parents: (1) ever had an emotional problem or mental illness; (2) had ever sought treatment with a psychiatrist, psychologist, social worker, doctor, or other health professional because of a mental health problem. The test-retest reliability of FHS's depression items were found to be moderate ( $r = .56$ ; Weissman, et al., 2000).

**Perceived family support.** The Perceived Social Support from Family (PSS-Fa) was used to assess adolescents' perceptions of social support received from family members (Procidano & Heller, 1983). It is a 20-item self-report questionnaire with a score range from 0 (no perceived social support) to 20 (maximum perceived social support). Each answer that indicates the

perception of family support will add 1 to the final score. The PSS-Fa has demonstrated concurrent validity with other measures of perceived family support (Cumsille & Epstein, 1994).

### **Procedures**

All procedures in this study were approved by the participating university's Institutional Review Board. The eligibility of adolescents and parents was first determined after adolescents' admission to the hospital. Eligible participants and parents were approached and agreements were acquired via written consent for parents and informed consent for adolescents. Baseline assessment was conducted within the first week of hospitalization and the follow-up assessment was conducted outside the hospital, either at an outpatient office adjacent to the hospital or in the participants' homes. Cash compensation, 30 dollars for parents and 20 dollars for adolescents, was offered to participants each time for completing the assessment.

### **Data Analysis Strategy**

The presence or absence of parent-adolescent agreement about adolescents' suicidal ideation and separately suicide attempts, both in the past year, was assessed at baseline. The agreement was defined as a binary variable (agree/disagree). In the agreed group, there are two types of agreements. (1) Both parents and adolescents reported past year suicidal ideation, or (2) both parents and adolescents reported past year suicide attempts. In the disagreed group, there are also two types of disagreements. (1) Only adolescents reported their past year suicidal ideation, while the parents either reported their children had no suicidal ideation, or they did not know about the information; or (2) only adolescents reported their past year suicide attempts, while the parents either reported their children had not attempted suicide, or they did not know about the information. Put another way, parent and adolescents were considered agreed with each other only when adolescents reported having past year suicidal ideation or suicide attempts, and

parents were aware of them. Parent and adolescents were considered disagreed only when adolescents reported having past year suicidal ideation or suicide attempts, but parents were not aware of them. Adolescents who reported no past year suicidal ideation or suicide attempts when assessed at baseline, whose parents also reported no suicidal risks in their children, were not coded as agreement-pairs in this study.

Cohen's kappa values were calculated to show the magnitude of chance-corrected agreement. Cohen's kappa coefficient is considered a conservative measure of agreement compared to simple percent agreement calculation (Strijbos, Martens, Prins, & Jochems, 2006). The advantage of a kappa value is its accountability of chance excluded agreement. If the raters completely agree with each other, then  $k = 1$ ; if no agreement exists or the agreement exists only by chance, then  $k = 0$ . McNemar tests were calculated to evaluate the difference between paired proportions. Significant McNemar tests suggest that one informant is significantly more likely to give a particular response.

To evaluate the effect of parent-adolescent agreement (agree = 1, disagree = 0) about severity of depressive symptoms and suicidal ideation at baseline and 12-months later, we used linear logistic regression modeling. In linear regression models including baseline and 12-month depressive symptoms and suicidal ideation, the adolescents' gender and history of multiple suicide attempts were controlled. We further controlled for adolescents' baseline level of suicidal ideation in models including suicidal ideation as an outcome at the one-year follow-up. Similarly, adolescents' baseline level of depressive symptoms was controlled in models including depressive symptoms at the one-year follow-up. For the suicide attempt outcome of any suicide attempt within one-year follow-up after hospitalization, logistic regression analysis was

conducted; adolescents' gender, history of multiple suicidal attempts and baseline level of suicidal ideation were control variables in this model.

The mediation effect of perceived family support was tested by the bootstrapping resampling model developed and presented by Efron and Tibshirani (1988). The basic rationale behind bootstrapping resampling is to test the indirect effect by repeatedly resampling the obtained sample of size  $n$ , which was used as a representation of the population. The process of repeatedly resampling mimicked the original sampling process and in each sampling process an indirect effect was tested. The whole process created a percentile-based, bias corrected confidence interval. The relationship can be yielded as significant if zero is not contained in the bias corrected confidence interval (Hayes, 2009). The superior validity and reliability of the bootstrapping resampling model have been reported by some studies (MacKinnon, Lockwood, & Williams, 2004; Williams & MacKinnon, 2008), and it has two huge advantages compared to the Baron and Kenny mediation model (1986). First, unlike the Baron and Kenny mediation model, the bootstrapping resampling model does not rely on the assumption that the sampling distribution of the indirect test is normal, and the assumption of normality is a huge limitation in the Baron and Kenny mediation model. Additionally, bootstrapping resampling gets around the controversial problem in terms of estimating the standard error for the mediation effect by not requiring it in the model (Hayes, 2009).

## **Results**

### **Participants' Baseline Characteristics**

In general, adolescent participants in this psychiatrically hospitalized population were highly depressive and suicidal. Both their baseline depressive symptoms and baseline suicidal ideation were not different from the depressive symptoms ( $F = 1.32, p = .09$ ) and suicidal



ideation ( $F = 1.07, p = .36$ ) at the 12-month period, respectively. The baseline demographic and clinical characteristics of both the adolescent participants and their guardians are provided in Table 1. Among this highly suicidal sample, almost 40% ( $n = 178$ ) of adolescents reported having attempted suicide more than once in their lifetime when assessed at baseline. The sample consisted of 36% ( $n = 162$ ) adolescents who had at least one parent with a history of a mental disorder(s). Within one year of hospitalization, 64 (14.3%) of the adolescents had attempted suicide at least once.

Table 2 presents the descriptive information for primary study variables at baseline and the 12-month follow-up. In this study, suicidal ideation was less strongly correlated to depressive symptoms at follow-up in boys ( $r = .33, p < .01$ ) than in girls ( $r = .43, p < .01$ ). In addition, an independent sample  $t$ -test comparing the mean baseline SIQ-Junior score between boys and girls indicated that girls had more severe suicidal ideation at baseline assessment ( $t = 2.02, p = .04$ ).

### **Indicators of Parent-Adolescent Agreement**

This study used two indicators of parent-adolescent agreement (see Table 3), which were agreement about adolescents' past year suicidal ideation and agreement about adolescents' past year suicide attempts. The total sample size was 448, with 428 adolescents agreement with their parents on suicidal ideation, and 271 agreed with their parents on suicide attempts. Among the 426 parent-adolescent pairs, 314 (73.7%) indicated an agreement about suicidal ideation in past year and 112 (26.3%) did not; among the 271 parent-adolescent pairs, 202 (74.5%) indicated an agreement about suicide attempts in past year and 69 (25.5%) pairs did not. For each indicator, we tested its relationship with the level of suicidal ideation and depressive symptoms in adolescents at baseline and 12-month follow-up. In addition, we also tested whether these indicators were good predictors of the risk of attempting suicide one year after hospitalization.

### **Extent of Agreement**

Last section covered what kind of parent-adolescent agreement we used as indicators, and this section reported the actual extent of agreement between parents and adolescents for each indicators. In particular, the agreement between adolescents and their parents in terms of adolescents' past year suicidal ideation and attempts were shown in Table 4. In this study sample, the agreement between adolescents and their parents regarding adolescents' past year suicidal ideation was no greater than chance, with  $k = .01$ . However, greater informant agreement about adolescents' history of suicide attempts was identified, with  $k = .56, p < .001$ . The result of the McNemar test showed that compared to their parents, adolescents were more likely to report their suicidal ideation and suicide attempt.

### **Primary Outcomes**

**Depressive symptoms (see Table 5).** No significant relationship was found between parent-adolescent agreement about past year suicidal ideation and adolescents' baseline depressive symptoms ( $b = .28, p = .68$ ). However, gender was a significant moderator for this relationship ( $b = -3.94, p = .01$ ). In particular, for girls who reported serious suicidal ideation during one year before hospitalization, their baseline depressive symptoms tended to be significantly higher when their parents also reported their daughters' past year suicidal ideation, compared to those girls who reported their past year suicidal ideation while their parents did not ( $b = 1.99, p = .02$ ). However, boys' baseline level of depressive symptoms was not related to the agreement regarding their past year suicidal ideation ( $b = -1.95, p = .12$ ). The gender difference at baseline diminished at the 12-month follow-up, and the relationship between agreement and the 12-month depressive symptoms, for both boys and girls, became insignificant ( $b = .68, p = .33$ ). Adolescent's history of multiple attempts, and parents' history of mental disorders did not

moderate any of the relationships; adolescents' perceived family support did not mediate any of the relationships.

The parent-adolescent agreement about adolescents' past year suicide attempt did not have a significant relationship with adolescents' level of depressive symptoms, both at baseline and 12-month follow-up period. In addition, these relationships were not moderated by adolescent gender, adolescent's history of multiple attempts, and parents' history of mental disorders. Adolescents' perceived family support did not mediate any of the relationships.

**Suicidal ideation (see Table 5).** Agreement regarding last year suicidal ideation was related significantly to level of suicidal ideation at both baseline and 12-month follow-up. Specifically, when parents were aware of adolescents' suicidal ideation during the one year period before their children were hospitalized, the level of suicidal ideation in adolescents was higher at baseline ( $b = 2.47, p = .03$ ), compared to the adolescents whose parents were unaware of their children's suicidal ideation. This significant relationship also existed at the 12-month follow-up ( $b = 2.45, p = .01$ ). In this model, the effect of both baseline and 12-month level of suicidal ideation was not moderated by gender, adolescents' history of multiple attempt, or parents' history of mental disorder. Perceived family support did not have a mediating effect.

Agreement about suicide attempts was significantly related to baseline suicidal ideation. In particular, when both the adolescents and their parents reported suicide attempts in the past year, adolescents' level of baseline suicidal ideation was significantly lower than those whose parents were not aware of their children's last year suicide attempts ( $b = -3.36, p = .02$ ). However, no significant relationship between agreements about past year suicide attempt and suicidal ideation was identified at the 12-month follow-up ( $b = 1.01, p = .32$ ). Similarly in this model, both the

baseline and 12-month level of suicidal ideation was not moderated by gender, adolescents' history of multiple attempt, or parents' history of mental disorder.

Lastly, adolescents' perceived social support (see figure 1) fully mediated the relationship between parent-adolescent agreement for adolescents' past year suicide attempt and adolescents' level of suicidal ideation at baseline (Bias corrected CI: -1.77, -.14). The total effect was significant ( $p = .02$ ) while the direct effect of the agreement for adolescent's baseline suicidal ideation was insignificant ( $p = .08$ ). In terms of the mediation, a higher level of perceived family support was significantly related to a higher agreement between adolescents and parents regarding adolescents' last year suicide attempt ( $t = 4.01, p < .001$ ). In addition, a higher level of perceived family support was related to a significantly lower level of suicidal ideation at baseline ( $t = -2.17, p = .03$ ).

**One year suicide attempt.** Contrary to our expectation, no significant relationships were established between the two indicators of agreement and suicide attempts within the 12-month follow-up period (suicidal ideation:  $b = .08, p = .73$ ; suicide attempt:  $b = -.48, p = .21$ ). Moreover, gender, adolescent's history of suicide attempts, parents' history of mental disorder and parents' history of suicide attempts did not have any moderating effect on these relationships either. Taken together, the agreement regarding adolescents' past year suicidal ideation and past year suicide attempts did not predict the risk of suicide attempts during the one year period after the adolescents had been discharged from the hospital.

### Discussion

This longitudinal study examined whether parent-adolescent agreement about adolescents' past year suicidal ideation and suicide attempts are predictors of suicidal ideation, suicide attempts, and depressive symptoms in acutely suicidal and psychiatrically hospitalized

adolescents. Our primary results point out that there is a possibility that parents were less likely to intervene and be supportive upon their awareness of adolescent's suicidal ideation, but may be more likely to become supportive after identify adolescents' suicide attempts. Moreover, agreement on suicidal ideation was strongly associated with girls' depressive symptoms, which could due to the fact that boys were less likely to express distress through depressive symptoms than females, but did it through other ways. Therefore their parents became aware of boys ideation because of other behaviors, and not depressive ones, which potentially caused the insignificant relationship between agreement on suicidal ideation and depressive symptoms in boys. Another possible interpretation is that depression and suicidal ideation are more closely correlated in girls than in boys. Furthermore, family support seems to be the pathway that accounted for the relationship between agreement on past year suicide attempts and baseline suicidal ideation. Higher perceived family support was associated with more parent-adolescent agreement as well as lower suicidal ideation. Finally, inconsistent with our hypothesis, the effect of agreement on adolescent suicidal and depressive related outcomes were neither influence by adolescents' history of multiple suicide attempts, or parents' history of mental disorders.

Compared to community samples in which almost 90% of parents were not aware of their adolescents' suicidal ideation and 95% were not aware of their adolescents' suicide attempts (Breton, et al., 2002), parents in this study had a relatively higher agreement with adolescents for both adolescents' past year suicidal ideation (74%) and suicide attempts (75%). This higher agreement rate may due to the fact that these adolescent participants had more severe suicidal and depressive symptoms, which were easier to identify. Allied with previous research (Kashani, Goddard & Reid, 1989; Sourander, Helstelä & Helenius, 1999), parents were more likely to identify external behavioral problems, including suicide attempts, compared to internal cognitive

issues, such as suicidal ideation. Similar to community studies (Sourander, Helstelä & Helenius, 1999), adolescents reported significantly more suicidal ideation and suicide attempts compared to their parents, indicating that adolescents may be a more valid sources of information compared to their parents when assessing their suicide risk.

### **Primary Outcomes**

Parent-adolescent agreement on adolescents' past year suicidal ideation predicted more severe suicidal ideation for both genders, at baseline and 12-month follow-up. The positive relationship between agreement and suicidal ideation may illustrate that compared to mild suicidal ideation symptoms, parents can more easily identify severe suicidal ideation. However, if both parents and adolescents reported that adolescents had attempted suicide in the past year, unlike the relationship between agreement on suicidal ideation and the baseline level of suicidal ideation, the level of baseline suicidal ideation was actually lower, instead of higher. The negative relationship between agreement about suicide attempt and baseline suicidal ideation shows that some events happened and they might cause a decrease in adolescents' baseline suicidal ideation. Such events were presented in families where parents were aware of their children's suicide attempts, which were absent in families where parents were not aware of their adolescents' past suicide attempt.

One explanation is that parents maybe more likely to become supportive when they were aware of their children's suicide attempt, while parents were less likely to react and acted on their children's suicidal ideation. This could be the case because suicidal behaviors are more obvious and severe, parents can easily feel the urgency to intervene since something serious might already have happened, for example a life-threatening injury. However, suicidal ideation is extremely problematic because it is a significant predictor for future suicide attempt, and what

threatens adolescents' lives is not the ideation itself, but rather the attempts. It is also harder for parents to intervene cognitive problems, such as suicidal ideation, compare to behavioral problems, such as suicide behaviors. Moreover, parents may also tend to experience stronger negative feelings, such as hostility, after identifying not-as-severe suicidal risks in their children. These assumptions are consist with previous findings which reported that people have the tendency to feel hostile when interacting with other individuals with emotional or behavioral problems (Coyne, 1976). Nevertheless, although parents did feel certain levels of hostility after identifying their children's suicide attempts, adolescents' suicide attempts were followed by an increase in their parents' caring and supportive feelings. In addition, compared to suicidal ideation, a lower level of negative feelings was related to suicide attempts (Wagner, Aiken, Mullaley, & Tobin, 2000). Supportive parenting style was reported to reduce the likelihood of adolescent suicidal problems (Boeninger, Masyn & Conger, 2012).

The assumption that parents were less likely to intervene upon realizing adolescents' suicidal ideation was also supported by the fact that parent-adolescent agreement about past year suicidal ideation was related to significantly higher suicidal ideation even at the 12-month follow-up. In particular, when there was severe suicidal ideation in adolescents during the past year period before hospitalization, and were easily identified by the parents, these severe suicidal ideation still existed one year after hospitalization. The long-lasting feature of suicidal ideation indicated that parents were very unlikely to intervene even when they were aware of their children's severe suicidal ideation.

On the other hand, parents' tendency to be supportive and caring after identifying adolescents' suicide behavior was also supported by the relationship between agreement about past suicide attempt and adolescents' depressive outcomes. Contrary to our hypothesis, parent-

adolescent agreement about adolescents' past year suicide attempts does not predict adolescents' level of depressive symptoms both at the baseline and 12-month follow-up. A weak relationship between suicide attempts and depressive symptoms is not a convincing explanation because of well-established evidences of an association between attempts and depression (e.g., Mann, Waternaux, Haas, Malone, 1999). A reasonable assumption could be that, similar to the suicidal ideation, parent-adolescent agreement about past year suicide attempts was very likely to associate with higher depressive symptoms in adolescents. Nevertheless, at the same time parents were very likely to offer more support to their children after identifying their children's suicide behaviors, which creates a negative trend in adolescents' depressive symptoms. The insignificant relationship might be the result of two effects cancelling each other.

Contrary to previous findings regarding agreement on adolescents' psychopathology (Cantwell, et al., 1997), in this study, gender played an important role in moderating the relationship between parent-adolescent agreement about past suicidal ideation and adolescents' baseline level of depressive symptoms. One possible interpretation of this result is that, boys were more likely to express depress (from sources such as suicidal ideation) through ways other than the actual feeling of depression, while girls were likely to concentrate on their depressive feelings. Put another way, girls tend to ruminate more on their depressive feelings while boys tend to use other methods to alleviate their stress. This assumption is supported by a number of previous studies (Broderick, 1998; Mezulis, Abramson, & Hyde, 2002; Nolen-Hoeksema, 1987). Girls' higher mean baseline SIQ-Junior score supported this assumption.

Another possible interpretation in regards to the significant positive relationship between agreement and baseline depressive symptoms in girls, but not in boys, could mean that depressive symptoms and suicidal ideation are more strongly correlated to each other in girls



than in boys, given that agreement about past year suicidal ideation only significantly related to baseline depressive symptoms in girls, but not boys. Put another way, even when both boys and girls suffered from severe suicidal ideation, which was confirmed by the agreement between parents and adolescents, the reason why such agreement only indicated higher depressive symptoms in girls was because suicidal ideation are less strongly correlated to depressive symptoms in boys. This assumption is supported by previous studies, which reported that compared to males, females diagnosed with a depressive disorder scored significantly higher on measures of depressive symptom count and suicidal ideation (Brown, Jewell, Stevens, Crawford, & Thompson, 2012). Similarly, Allison and colleagues (2011) also found that at moderate levels of depression females had a higher risk of suicidal ideation compared with males, which is one explanation for the overall higher levels of female ideation found in this study.

Furthermore, perceived family support was found to play an important role between the relationship of parental awareness of adolescents' past suicidal attempts and adolescents' baseline suicidal ideation. This finding is consistent with previous studies which reported that families with low warmth and acceptance of parents, greater discrepancies in terms of parent and children's report of symptoms were identified (Kolko & Kazdin, 1993; Treutler & Epkins, 2003). Low levels of family support have also been reported to associate with higher level of suicidal ideation in adolescents (Blum, Sudhinaraset, & Emerson, 2012; Bonanno, & Hymel, 2010). This finding strongly supported our hypothesis of the negative relationship between agreement about suicide attempts and baseline suicidal ideation; as well as why parents' awareness of adolescents' past year suicidal ideation did not reduce adolescents' suicidal ideation at baseline. In particular, adolescents experienced lower level of suicidal ideation at baseline not only because their parents were aware of their past suicide attempts; but the lower ideation was strongly influenced

by their parents' willingness to offer more social support after identifying the suicide attempts in their children. In addition, even though parents were aware of adolescents' past suicidal ideation, because such awareness did not increase adolescents' perceived family support, so that adolescents' suicidal ideation remained high at the baseline assessment. It may be especially meaningful to apply support and communication based family interventions to help adolescents who perceived low social support and whose suicidal thoughts and behaviors are not identified by their parents.

Finally, contrary to our hypothesis, parents' awareness of adolescents' past suicidal ideation and suicide attempts did not predict the risk of actual suicide attempts during 12-month follow-up period. Combined with previous findings from this study, parents' awareness of adolescents' past suicidal problems is not a good predictor for one year depressive symptoms, suicidal ideation and suicide attempt outcomes. This result contradicts previous findings from a community based study which reported that parents' lack of recognition of children's thought problem predicted significantly more deliberate self-harm behaviors in children four years after the baseline assessment (Ferdinand, van der Ende, & Verhulst, 2004). One explanation for the difference in results could be that adolescents who participated in this study were highly suicidal, whose families might have a dysfunctional parent-children dyads, compared to that of the community sample. Therefore, in this study, adolescents' longitudinal depressive and suicide related outcomes might be irrelevant to whether their parents were aware of their symptoms or not, since the parents might not do anything upon their awareness at all; or even if they did intervene after identifying suicidal risks in adolescents, it might only yield a strong short-term outcomes, rather than a beneficial long-term outcomes.

### **Study Limitations**

There are several important limitations to note in this study. The fact that all adolescent participants were hospitalized due to recent suicidal ideation or suicide behaviors limited the generalizability of the findings, and does not apply to adolescents from outpatient clinics or from the community. However, focusing on such a high risk population is a strength as well. This sample of adolescents were facing serious threats and because parents were the most available source of support, studying parent-adolescent agreement in the acutely suicidal population is extremely meaningful. In addition, the fact that the majority of the sample consisted of white adolescents from the Midwestern region of the United States also limits the generalizability of the findings, and does not apply to inpatient adolescents from other racial/ethnic groups and geographic regions. A more diverse sample of adolescents should be considered in future studies. Moreover, the majority of the parent guardians who participated in the study were mothers, and the parent-adolescent agreement is gender biased which could not generalize to fathers or other kinds of caregivers.

In addition, the measure used to investigate parents' history of mental health problems has several limitations. More specifically, only one informant, usually the mother, completed the assessment and there are no other sources of information, such as report from other guardians, to validate the reported information. Moreover, the timing of the parental mental health problems was not assessed in this study. Previous studies have shown that compared to early exposed children, children exposed to mothers' depressive episode at older ages will be less vulnerable to adverse influences. It is very likely children have developed sophisticated coping strategies to deal with these problems at older ages (Compas, 1987; Sroufe & Rutter, 1984). Not knowing the time of onset for parents' mental health problems restricted us from knowing to what extent and

in which way parents' mental health problems had an impact on the adolescents. It is even possible that parents' mental health problems were solved before the birth of the children, and the adolescent might not have been exposed to parental psychopathology during their development at all. Future studies should consider a more comprehensive assessment of family mental health information. Furthermore, we used parent-adolescent agreement about last year suicidal ideation and suicide attempt as the indicators in our study, and we did not know whether they agreed about adolescents' recent suicide problems, or on the long-term ones.

Finally, we did not conduct Bonferroni or Tukey test to adjust our p-value due to the fact that we only presented a limited number of analyses. Therefore the results should be interpreted conservatively.

### **Clinical Implications and Future Directions**

Within the context of these limitations, our findings indicated that adolescent self-report suicide risk is a valuable source of information while assessing suicidal ideation and suicide attempt; reinforcing the critical necessity of involving adolescents in the assessment process. In families with a dysfunctional parent-child relationship, in which the adolescent is highly suicidal but has not attempted suicide yet, parents are less likely to be supportive even after they have identified the severe suicidal thoughts in their children. In these cases, solely increasing parental awareness of adolescents' suicidal thought may not be enough. Upon understanding the symptoms, it is especially important to involve parents in the adolescents' short- and long-term treatment and recovery process to help families better support adolescents and provide a healthy home environment.

Due to the fact that parents' awareness of adolescents' past suicide attempts did relate to better outcomes in adolescents, it is still meaningful to educate all parents in clinical settings.

The education need to focus on the significant discrepancy between parents and adolescents in regards to their awareness of adolescents' suicidal thoughts and behaviors so that they may better monitor the mental health of their adolescents. It may also be useful to conduct longitudinal interventions after a one-time clinical education to improve long-term outcomes in adolescents. These data suggest that boys and girls may have difference methods alleviating their distress; and girls' suicidal ideation may have a stronger comorbidity with depressive symptoms, compared to that of the boys. Given this situation, intervention and prevention programs should be aware of the gender difference when assessing suicidal risks in adolescents and should also implement depression related intervention after identifying suicidal ideation in girls.

These findings also have implications for research on the assessment, treatment, and case management of adolescent suicide risks. For instance, the effect of parents' awareness of adolescents' suicidal risk on treatment adherence and outcomes are still understudied. Future studies should be conducted to improve our understanding of why the disagreement exists, and why there is a gender difference in terms of the effect of the disagreement. In addition, interventions should also address both parents and adolescents because it will be difficult to address suicidal ideation and suicide attempts in adolescent without improving the knowledge of individuals who spend the most time with the adolescents. Studies should address what would encourage adolescents to share their negative emotions with parents, how to increase parents' awareness of the suicidal risks in adolescents, and what can be done help parents more actively support their children while adolescent is merely thinking about suicide, without any actual attempts of suicide yet.

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Table 1  
*Sample Characteristics*

	n	%
<b>Gender</b>		
Female	319	71.2
Male	129	28.8
<b>Race</b>		
Caucasian	375	83.7
African American	29	6.5
Others	32	7.1
<b>Life time history of suicide attempts</b>		
Multiple attempter	178	38.0
Not a Multiple attempter	270	57.7
<b>Parent's history of mental disorder(s)</b>		
Either parents has a history of mental disorder(s)	162	36.2
Both parents have never had a mental disorder	114	25.4
<b>One year suicide attempt after hospitalization</b>		
Attempted	64	14.3
Not Attempted	291	65

*Note*, Agreement and Disagreement did not add up to 100% because of missing data.

Table 2

*Descriptive Statistics for Primary Outcomes and Mediation Variable*

Measures	Minimum	Maximum	M	SD
<b>Depressive symptoms</b>				
Children's depression rating scale - baseline	21	91	60.83	13.09
Children's depression rating scale - 12-month	17	79	33.58	11.72
<b>Suicidal ideation</b>				
The Suicidal Ideation Questionnaire (Junior High School Version) - baseline	3	90	46.21	21.42
The Suicidal Ideation Questionnaire (Junior High School Version) - 12-month	0	83	17.13	14.08
<b>Adolescents' perceived social support</b>				
Perceived Social Support from Family - baseline	0	20	8.83	5.58

Table 3

*Two Indicators of Parent-Adolescent Agreement*

Group	n	Agree	Disagree
Agreement about last year suicidal ideation	426	314 (73.7%)	112 (26.3%)
Agreement about last year suicide attempt	271	202 (74.5%)	69 (25.5%)

Note, Agreement and Disagreement did not add up to 100% because of missing data.

Table 4

*Parent-Adolescent Agreement for Suicidal Thoughts and Behaviors in Past Year*

	PY	PN/DN	K	M
<b>Ideation</b>				
AY	314	112	.012	82.93***
AN	11	5		
<b>Attempt</b>				
AY	202	69	.56***	36.24***
AN	13	105		

Note, AY = adolescents answered yes; AN = adolescents answered no; PY = parents answered yes; PN/DN = parents answered no or I do not know. Parents and adolescents were coded as agree ONLY when adolescent reported yes and parents reported yes (AY-PY); parents and adolescents were coded as disagree ONLY when adolescent reported yes while parents reported No or I don't know (AY-PN/DN).

\*\*\*  $p < .001$ .

Table 5

*Depressive symptoms and suicidal ideation outcomes at baseline and 12-month follow-up*

	Depression				Suicidal Ideation			
	Baseline CDRS score		12-month CDRS score		Baseline SIQ-Junior Score		12-month SIQ-Junior Score	
	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>
<b><i>Suicidal ideation</i></b>								
Overall	.28	.68	.68	.33	2.47	<b>.03</b>	2.45	<b>.01</b>
Boys	-1.95	0.12		NS		NS		NS
Girls	1.99	<b>.02</b>		NS		NS		NS
<b><i>Suicide attempt</i></b>								
General	-.90	.31	.37	.66	-3.37	<b>.02<sup>1a</sup></b>	1.01	.32

*Note.* Adolescent gender, adolescents' history of multiple attempt(s) were controlled in all these models.

Furthermore, parents' history of mental disorder(s) were added into the model when testing their interactions with adolescents' gender. The baseline depressive symptoms were controlled when testing the relationship between agreements and the 12-month outcome of depressive symptoms. Similarly, the baseline suicidal ideation score were controlled when testing the relationship between agreements and the 12 month outcome of suicidal ideation.

*1a:* significant mediation effect of adolescents' perceived social support. Refers to Figure 1 for detail.

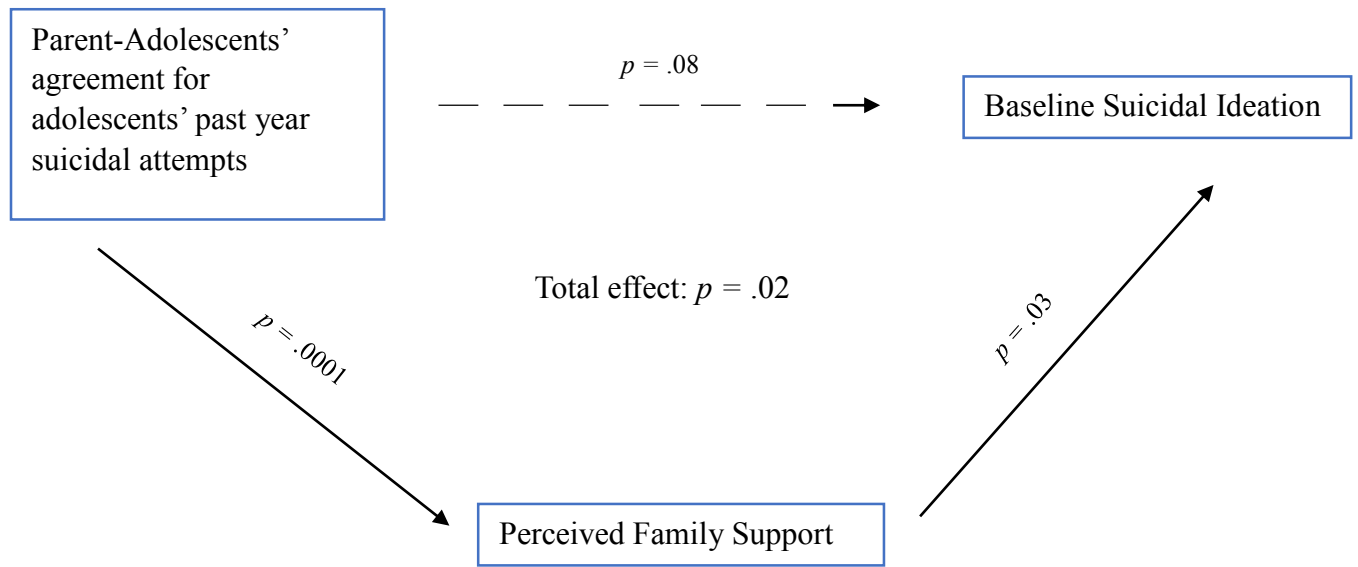


FIGURE 1: Mediation Effect of Perceived Family Support between Agreement for Past Year Suicide Attempts and Baseline Suicidal Ideation