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## Adolescents' Daily Worries and Risky Behaviors: The Buffering Role of Support Seeking

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### Abstract

**Objective:** With worries and risky behaviors becoming more prominent in adolescence, this study investigated bi-directional temporal connections between these two important adolescent concerns; that is, whether change in one concern is linked to change in the other either within the same day or during the next day. We also tested whether the coping strategy of seeking support from family and friends moderated the link between worries and risky behaviors.

**Method:** For ten days, an ethnically and racially diverse sample of adolescents (N = 103; mean age = 18.0) reported on 26 common worries, 18 risky behaviors, and the impact of seeking support from others.

**Results:** Multi-level models showed that worries and risky behaviors co-varied on the same day and that worries predicted next-day risky behavior for males but not for females. In contrast, risky behaviors did not predict next-day worries. For adolescents reporting negative experiences of support seeking, worries led to next-day risky behaviors and risky behaviors led to next-day worries. Females' positive support seeking experiences buffered the association between risky behaviors and next-day worries. These results were significant beyond any influence of daily negative mood or depressive and anxiety symptoms.

**Conclusions:** The data demonstrate that worries and risky behaviors may be situational triggers for each other and highlight the importance, from intervention perspectives, of adolescents' communication of concerns to others.

### Keywords

adolescent; worry; risky behavior; support seeking; daily diary

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Worries are common in adolescents' everyday lives and, at this developmental stage, take on new significance as they become more elaborate and abstract (e.g., Laugesen, Dugas &

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Bukowski, 2003; Muris, Merckelbach, & Luijten, 2002). Risky behaviors, which involve rule violations such as reckless driving and substance use, are a hallmark of adolescent development and can precipitate troublesome consequences (see Steinberg, 2004). Although both worry and risky behaviors are important concerns during adolescence and despite theoretical plausibility that they are interconnected, no published research has investigated associations between them. Moreover, if linked, it is not obvious whether they might increase or decrease the likelihood of one another. On the one hand, worries may prompt risky behaviors as a distraction to reduce distress (See Ottaviani et al., 2015); alternatively, worrying about future negative consequences may enhance risk avoidance (Borkovec, Alcaine, & Behar, 2004). Moreover, bi-directional processes also may take hold where risky behaviors provide temporary relief from worries but, in turn, provoke new or additional worries (Cooper, Agocha, & Sheldon, 2000).

The primary objective of the present study is to investigate whether there are temporal associations between worry and risky behaviors: that is, whether change in one is linked to change in the other either in the same day or on the next day. Though worry and risky behaviors frequently are conceptualized as dispositional characteristics, the present study assumes that there is meaningful variability across days in both worries and risky behaviors. Investigating bidirectional temporal links between these two important concerns will show whether each is a situational trigger for the other. Moreover, to understand the links between worries and risky behaviors more fully, we examine the role of a common coping strategy for adolescents—seeking the support of others. Seeking support from family and friends is investigated as a mitigating factor as it has been inversely related to adolescents' worries (Brown, Teufel, Birch, & Kancherla, 2006) and risky behaviors (e.g., Kerr, Stattin, & Burk, 2010).

Through daily diary questionnaires, everyday fluctuations in all three variables—worries, risky behaviors, and seeking support—are studied as they naturally unfold in adolescents' day-to-day lives. The advantages to daily monitoring of worries and risky behaviors include capturing within-person variability and minimizing recall bias (Bolger, Davis, & Rafaeli, 2003). By asking about the extent and content of worry during the past day, the adolescent aggregates information over a limited time frame. Repeated assessments allow for examining increases and decreases in worry relative to the adolescent's own baseline as well as for testing directional temporal sequences between worry and risky behaviors (Gunthert & Wenzel, 2012). Identifying possible proximal antecedents of both worries and risky behaviors is of special importance during adolescence since excessive worries may gradually progress into clinically internalized symptoms (Holaway, Heimberg, & Coles, 2006), and infrequent, milder forms of risky behaviors may evolve into more severe, chronic behaviors (e.g., Loeber, Burke, & Lahey, 2002).

## Adolescents Worries

There are varying conceptualizations of adolescents' worries, ranging from pathological to normative. On one hand, worry is conceptualized as an enduring, persistent personality characteristic that is experienced as an uncontrollable process. It is the key cognitive indicator of anxiety disorders and also related to insomnia and somatic complaints

(Berenbaum, 2010; Borkovec, Ray, & Stöber, 1998; Brown et al., 2006). Alternatively, worry is viewed as a more normative and common thought process linked to upcoming stressful events (Olatunji, Broman-Fulks, Bergman, Green, & Zlomke, 2010). Daily worry, which is our focus here, can be influenced by both persistent negative cognitive styles as well as the anticipation of specific upcoming concerns. The assessment of daily worries captures the ongoing experience of worry and how day-to-day changes in worry co-vary with other experiences, specifically risky behaviors. Thus, daily reporting of worries allows for inferences about temporal sequencing between worries and risky behaviors.

An important social-emotional change exhibited by adolescents is their attention to how they measure up to real or idealized others (Institute of Medicine, 2010)—a preoccupation that tends to be reflected in the amount and the nature of their worries. It has been found that about 25% of adolescents report excessive and uncontrollable worries (Fournier, Freeston, Ladouceur, Dugas, & Guévin, 1996). The majority of adolescents report worrying at least occasionally, with common topics of worry including school performance, social relationships, and appearance (e.g., de Matos, Gaspar, Cruz, & Neves, 2013). Although worry appears to be a somewhat typical phenomenon in adolescents' lives, it is important to determine whether it triggers other problems and which youth are more prone to negative behavior patterns that involve worry.

To date, empirical information about adolescents' worries is quite limited. When 16- to 17-year-old high school students monitored their worry duration and frequency for 6 days, on average they worried approximately 4 times per day and for about 30 minutes per day; 98% reported at least one worry, and worry duration related to number of health complaints reported at the end of the 6 days (Brosschot & Van Der Doef, 2006). In another study of 14- to 18-year-olds assessing worry across 7 days, cross-day associations showed that higher levels of worry were predictive of increased anxiety on the next day and cognitive avoidance was predictive of next day increases in worry (Dickson, Ciesla & Reilly, 2012). Thus, the frequency of daily worry and its relation to other proximal concerns clearly warrants additional research.

## Daily Worry Influences on Daily Risky Behaviors

### Risk Enhancement.

There are two theoretical explanations for how worries might precipitate risky behaviors. First, engaging in certain risky behaviors, such as substance use, can be a source of temporary relief and distraction from worry (Cooper et al., 2000) and provide a false sense of control (Kashdan, Collins, & Elhai, 2006). Second, worry about social relationships may motivate adolescents to engage in risky behaviors as a way to gain acceptance from peers. Turning to risky behaviors fits with increases in impulsivity and sensation seeking and with incompletely developed decision-making and emotion regulation during adolescence (see Steinberg, 2007). Though not testing daily worry per se, a study involving late adolescents and young adults showed that global tendencies to ruminate are associated with behavioral dysregulation, independent from symptoms of anxiety and depression (Selby, Anestis, & Joiner, 2008). Based on 6-week assessments, anxiety predicted subsequent risky behaviors for male, but not female, adolescents (Auerbach, Kertz, Gardiner, 2012); however, no similar

lagged associations emerged for depressive symptoms (Auerbach, Tsai, & Abela, 2010). In addition, the de Matos and colleagues (2013) survey of youth aged 9–17 found that that 6% of females and 10% of males engage in poor coping strategies, such as overeating, drinking, cutting, or hitting, in response to worries. Although showing evidence of risk enhancement, none of these prior studies actually demonstrates real-time associations between worry and risky behaviors.

### **Risk-avoidance.**

Consistent with views that worry is an avoidant mechanism (Borkovec et al., 2004) and intended to prevent perceived harms, it is also theoretically feasible that worry—particularly worry about doing the right thing—is associated with cautiousness. Those who worry about achievement and about their future are likely to follow rules. Support for the risk-avoidant hypothesis comes from a study with undergraduate students where trait worry was associated with risk avoidant decision-making during a computerized task (Maner et al., 2007). Whether risk avoidance goes beyond global behaviors such that worry actually reduces the immediate likelihood of risky decisions and behaviors is yet unknown.

### **Daily Risky Behaviors Influences on Daily Worries.**

Though research has not yet investigated associations in the opposite direction—whether risky behaviors lead to increases or decreases in worries—it is conceivable that the real or anticipated consequences of risky behaviors may be the basis for increased worries over time. Thus, we expect to find an across-day intensification from risky behaviors to worries. We base this hypothesis on distantly related studies that show risky behaviors contribute to more depressive symptoms (Auerbach et al., 2010; Hallfors, Waller, Bauer, Ford, & Halpern, 2005). With daily diary data providing the opportunity to test bi-directional effects—and thus make more definitive statements about directional influences—cross-day analyses in this study can bring greater clarity to associations between worries and risky behaviors.

### **Support Seeking as a Buffer between Worry and Risky Behaviors**

Support seeking is a commonly reported strategy in adolescent coping literature (Zimmer-Gembeck & Skinner, 2011). Talking to parents is reported to be an effective way to reduce common worries among youth (Brown et al., 2006). Other than distraction, adolescents endorsed seeking support as their second most frequently reported strategy to cope with their worries, with seeking support from friends more common than parents (de Matos et al., 2013). Seeking support does not have a consistently positive or negative impact and, at times, is linked to higher (Aldridge-Gerry et al., 2011) and lower (Metrik, Frissell, McCarthy, D'Amico, & Brown, 2003) subsequent engagement in risk taking behaviors. While little is known about the emotional impact of seeking support and how that impact relates to worries or risk behaviors, we test support seeking as a moderator between worry and risky behaviors.

## Gender

Trait worry is found to be higher among adolescent females whereas no gender differences are found in daily worries (Brosschot & Van Der Doef, 2006). Additionally, adolescent males often report more risky behaviors and are more likely to engage in risky behaviors in response to worry (de Matos et al., 2013) or to related constructs such as anxiety (Auerbach et al., 2012). Female adolescents instead tend to seek others' support in times of need (see Rose & Rudolph, 2006) and, specifically, in response to worry (de Matos et al., 2013). Thus, we expect stronger links from worries to risky behaviors for males and a stronger buffering effect of support seeking for females.

## Present Study

The present study addresses the following three questions: (1) to what extent do worries and risky behaviors co-occur on the same day and do they increase the likelihood of one another the following day? We hypothesize a positive association on the same day (Hypothesis 1a) as well as bi-directional positive associations between worries and risky behaviors across days (Hypothesis 1b); (2) Does support seeking moderate the links between daily worries and daily risky behaviors? We hypothesize that support seeking that has a positive impact will buffer the effect of worries on next-day risky behaviors (Hypothesis 2a) and, likewise, will buffer the effect of risky behaviors on next-day worries (Hypothesis 2b); (3) Does gender moderate the hypothesized links? We anticipated stronger links between worry and risky behaviors for males, but stronger moderation effects of support seeking for females. In addition, we provide descriptive data on the nature of adolescents' daily worries given the scarcity of information on this important dimension of adolescent mental health. Finally, because we aim to discern the impact of daily worries and risky behaviors beyond global anxiety and depression, we conduct preliminary analyses testing the moderation effects of overall levels of anxiety and depression on the worry-risky associations. We also test the moderating effect of age since both risk-taking (Steinberg et al., 2008) and worry increase during adolescence (Fowler & Szabó, 2013).

## Method

### Overview

The present study uses data from an ongoing longitudinal study examining family stress and adolescent adjustment in families recruited from the community through flyers, paid advertisements, and word-of-mouth. Eligibility for the larger study required that both parents lived with the child for three or more years at study entry, all three family members were able to complete the procedures in English, and the child was either age 9–10 (cohort 1) or in middle school for families joining the project at wave 3 (cohort 2) (see Margolin, Vickerman, Oliver, & Gordis, 2010). The data presented here are part of the wave 5 procedures.

### Participants

Of the 131 total wave 5 participants, 103 (46 female; 66 from cohort 1 and 37 from cohort 2) participated in the daily data collection and thus were included here. Participants' mean age

was 18.00 years ( $SD=1.08$ ). Reflecting the metropolitan area of recruitment, 32.3% of adolescents self-reported their ethnicity as Hispanic/Latino. Self-identified race was 37.4% Caucasian, 29.3% more than one race, 20.2% Black/African American, 5.1% Asian/Pacific Islander, and 8.1% other/unknown. On average, families reported an income of \$90,927 ( $SD=\$76,179$ ); 26% reported incomes  $<\$50,000$ ; 43% were between  $\$50,000$  and  $\$100,000$ , and 31% were  $>\$100,000$ ; 8% of families reported incomes below the national poverty level. Parents have averaged 14.6 ( $SD=2.8$ ; range = 2–20) years of education. We tested for systematic attrition by comparing the 28 participants who were eligible to complete the daily data but did not do so versus the 103 who did participate; no significant differences emerged in race/ethnicity, annual family income, parents' level of education, or depression and anxiety global levels.

## Procedure

At the end of a laboratory-based meeting, participants were instructed in the daily survey procedures and completed day 1 of the home data collection by reporting on the immediately preceding day. Participants then were instructed to independently fill out a daily survey at the end of nine more consecutive days. Participants were given the choice of completing the surveys via on-line Qualtrics surveys or on paper questionnaires. Thirteen participants elected the print option and were given nine paper surveys to take home and nine pre-stamped envelopes to mail them back. To complete the survey on-line, participants received an email reminder at 5:00 p.m. each day that directed them to a Qualtrics survey. The surveys, which were identical across days, included items about daily worries, risky behaviors, and seeking support as a coping strategy, as well as a number of other dimensions about daily activities and interactions. Of 131 participants who began home data collection in the lab, 103 provided useable data, which required at least two consecutive days of daily data. Compliance with the home data collection was high. On average, participants provided 9.0 days of data ( $SD = 2.2$ ; median = 10), with 84% providing at least nine days of data. We had a total of 925 days of daily data, which included 638 weekdays and 287 weekend days. We monitored the timeliness of survey completion through time-stamps on the on-line surveys and through postal date-stamps for mailed surveys. Of the completed surveys, 762 (82.2%) were completed (or mailed) within 24 hours of the date of intended reporting and 89.3% were completed within 48 hours.

## Measures

**Daily worries.**—Table 1 lists the 26 daily items that were presented to assess wide-ranging topics of worry. Following the prompt, “Today, how much did you worry about...,” adolescents rated each worry on a 4-point scale ranging from 0 (*not at all*) to 3 (*a lot*). A total score represents the mean across items. Within-day reliability was .89.

**Daily risky behaviors.**—The daily survey also included 18 items assessing broad-based risky behaviors. Some items were adapted from CDC Youth Risk Behavior Surveillance Questionnaire (YRBS; Grunbaum et al., 2003) though our primary focus was on rule-breaking behaviors that could occur on a daily basis. Items targeted delinquency (e.g., “Today I broke, damaged, or destroyed something belonging to others on purpose”), school/work behavior problems (e.g., “Got in trouble at school”), substance abuse (e.g., “Today I

used an illegal drug or prescription drug not prescribed for me”), and endangering behaviors (“Today I drove or rode in a car without wearing a seat belt or drove over the speed limit”). Respondents indicated whether they engaged in the behavior on a 4-point scale ranging from 0 (*not at all*) to 3 (*a lot*) with the total score representing the mean across the 18 items. Within-day reliability was .78.

**Daily support seeking.**—Embedded in a list of 27 daily coping items, 5 items assessed whether the respondents interacted with others (friends and relatives) as a way to cope with concerns. The general prompt read, “Below are some things that people do because these things make them feel good or these things help them to deal with some concern or hassle. Please indicate whether or not you did each thing today.” For each item endorsed, they were asked a follow-up impact question: “How did it make you feel?” with a 5-point response rating scale including  $-2$  (*a lot worse*), 0 (*no better or worse*), and  $+2$  (*a lot better*). The following 5 items addressed various ways to communicate with others in an effort to deal with concerns: 1) *shared my problem with others, enlisted their support, encouragement and advice*,  $M$  impact = 0.74,  $SD$  = 0.85, range =  $-2$  to 2); 2) *talked to friends*,  $M$  impact = 1.21,  $SD$  = 0.83, range =  $-2$  to 2); 3) *talked to relatives*,  $M$  impact = 0.78,  $SD$  = 0.94, range =  $-2$  to 2); 4) *talked with someone on the phone or face to face*,  $M$  impact = 0.68,  $SD$  = 0.80, range =  $-2$  to 2); and (5) *interacted with friends on a computer*,  $M$  impact = 1.07,  $SD$  = 0.86, range =  $-2$  to 2). A mean daily impact score was calculated across the impact ratings. Within-day reliability was .76.

**Covariates.**—As is typical of daily diary studies, we accounted for differences related to weekend versus weekday and numerical day of reporting (1 to 10) by including these as covariates. Additional covariates included total depression symptoms assessed through the Beck Depression Inventory-II (BDI-II) (Beck, Steer, & Brown, 1996,  $\alpha$  for this sample = .89) and anxiety symptoms assessed through the SCL-90 (Derogatis, Lipman, & Covi, 1973,  $\alpha$  for this sample = .88) due to their associations with worry. Similarly, we tested daily negative mood as a covariate, due to its potential association with daily worries (Dickson et al., 2012); negative mood was assessed as part of the daily survey and was calculated as the mean score of participants’ reports on 9 negative emotions (e.g., sadness, nervousness, and distress). Item responses ranged from 0 (*slightly or not at all*) to 4 (*extremely*). Within-day reliability was .77.

## Analytic Plan

We conducted multilevel modeling with daily observations nested within participants. Associations among daily constructs were conducted using multilevel regression and those not involving daily constructs (e.g., age and psychological symptoms) were run using Pearson correlation. We tested hypotheses with multilevel path analysis and used the lagging approach described by Bolger and colleagues (2003) to test the direction of temporal effects. Cross-lagged panel models were used to simultaneously test the bidirectional associations between variables (i.e., daily worries predict next-day risky behavior and vice versa) while statistically adjusting for associations at the same time point and for autoregressive effects. Within-person predictors were group-mean centered consistent with recommendations by Enders and Tofghi (2007) for cross-sectional multilevel modeling analyses. All available

cases were analyzed with maximum likelihood estimation in Mplus Version 7 (Muthén & Muthén, 2012). Multiple group analyses were used to test for moderating effects of gender; we individually constrained paths in each model to be invariant between genders. The one degree of freedom nested  $\chi^2$  difference test was used to determine if any parameters in the model were significantly different between groups. First, all parameters were free; then we equated intercepts and each of the paths across genders. If a significant increase in fit was found, that model was then selected and subsequent constraints were made using that model. When the difference in model fit was not significant, we present the more parsimonious model. To help account for the non-normality of risky behaviors, we used robust standard errors. We also tested within-level covariates (i.e., the numerical day of reporting, negative mood, and weekend) on level 1 and the between-level covariates (i.e., age, depression symptoms, anxiety symptoms) on level 2. Including these variables did not change the significance, magnitude, or direction of the findings and thus the covariates were dropped from further analyses. We tested anxiety, depression, and age as moderators using cross-level interaction models, which were all non-significant. We tested a simpler version of the hypotheses for risky behaviors as a count variable using Zero Inflated Poisson (ZIP) models. Similar patterns of results emerged from ZIP models and standard HLM analyses; for ease of interpretation, we present the results from the standard MLM models.

## Results

### Descriptive Statistics and Inter-Correlations

Over the 10 days of daily data collection, 102 adolescents (100% of the females; 98% of the males) reported at least one worry, and 746 days (80.6% of the total 925 days) included endorsement of at least one worry. About 93% of adolescents reported at least one intense worry (  $\geq 2$ ) and 25% reported more than two intense worries. Table 1 displays the daily worry items, mean scores, the percent of participants who endorsed each item, and the percentage of total days that each item was endorsed. The six worries endorsed by over two-thirds of the sample are ‘appearance,’ ‘grades or school,’ ‘money problems,’ ‘upcoming event,’ ‘relationship with a friend,’ and ‘health.’ Each item was endorsed on over 30% of the total 925 days. The three most intense worries (by mean scores) were the same for males and females; however, rank order for females was ‘appearance,’ ‘money,’ and ‘grades or school,’ and, for males, was ‘grades or school,’ ‘money,’ and ‘appearance.’ Three of the 26 items, but not overall level of worries, showed differences between males and females: Females worried more about their appearance,  $M(SD) = 0.78(0.74)$  for females and  $0.50(0.47)$  for males,  $t(101) = 2.29$ ,  $p = .03$ , and about dating relationships,  $M(SD) = 0.47(0.72)$  for females and  $0.25(0.36)$  for males,  $t(101) = 2.01$ ,  $p = .04$ , whereas males worried more about being hassled by the police,  $M(SD) = 0.01(0.05)$  for females and  $0.10(0.2)$  for males,  $t(101) = -2.67$ ,  $p = .005$ .

Seventy-nine adolescents (77% of the females and 77% of the males) reported at least one risky behavior during the 10 days of data collection and 301 (33%) of the days included endorsement of at least one risky behavior. The most common risky behaviors were ‘got in trouble at school’ (30%), ‘reckless driving’ (15%), and ‘illegal drugs’ (15%).



Most every adolescent (100% of the females and 98% of the males) reported engaging in at least one support seeking behavior over the course of the study; 806 (87%) days included endorsement of at least one item of support seeking with 675 representing interactions with friends and 389 representing interactions with relatives. Overall support-seeking impact was positive, yet, on 14% of the days adolescents reported negative impact from support seeking (12% of the days for females and 16% of the days for males).

Table 2 presents *Ms* and *SDs* for all study measures and the inter-correlations among them separately for males and females. Daily worries and daily risky behavior tend to co-occur on a given day and, in addition, daily worries and daily risky behaviors were both positively associated with daily negative mood. Daily worries were associated with overall levels of anxiety and depression for males but not for females. Adolescents appear to report fewer worries the more days that they have completed the survey, perhaps reflecting reporter fatigue.

Associations between worries and next-day risky behaviors,  $r = .04$ ,  $p = .30$ , and between risky behaviors and next-day worries,  $r = -.09$ ,  $p = .17$ , were non-significant for females, but positive and marginally significant for males,  $r = .25$ ,  $p = .06$ ;  $r = .33$ ,  $p = .07$  respectively. Associations between support seeking and next-day risky behaviors were non-significant for males,  $r = -.02$ ,  $p = .81$ , and females,  $r = .05$ ,  $p = .51$ . As were associations between support seeking and next-day worries,  $r = -.05$ ,  $p = .16$  for males, and  $r = -.02$ ,  $p = .79$  for females.

### HO 1: Bi-Directional Associations between Daily Worries and Daily Risky Behaviors

As hypothesized, daily worries and risky behaviors were significantly associated on the same day,  $\beta = .29$ ,  $SE = 0.12$ ,  $p = .02$ . Gender did not moderate the within-day association,  $\chi^2 = 0.95$  (1),  $p = .33$ . Based on the lagged analyses, daily worries positively predicted risky behaviors on the next day,  $\beta = .10$ ,  $SE = 0.04$ ,  $p = .03$ , but risky behaviors did not predict next-day worries,  $\beta = .12$ ,  $SE = 0.13$ ,  $p = .14$ . In addition, multi-group analyses showed that gender moderated the path from worries to next-day risky behaviors,  $\Delta\chi^2 = 10.13$  (1),  $p < .001$ . Worries significantly predicted an increase in risky behaviors for males,  $\beta = .15$ ,  $SE = 0.06$ ,  $p = .01$ , but not for females,  $\beta = .01$ ,  $SE = 0.04$ ,  $p = .73$ . Although gender moderated the path from risky behaviors to next-day worries,  $\Delta\chi^2 = 13.21$  (1),  $p < .001$ , the separate paths were not significant for either males,  $\beta = .20$ ,  $SE = 0.13$ ,  $p = .13$  or females,  $\beta = -.14$ ,  $SE = 0.10$ ,  $p = .17$ . In addition, the auto regression associations were significant for males but narrowly missed significance for females: for worries to next-day worries,  $\beta = .31$ ,  $SE = 0.03$ ,  $p < .001$  for males and  $\beta = .09$ ,  $SE = 0.05$ ,  $p = .08$ , for females; for risky behavior to the next-day risky behavior,  $\beta = .36$ ,  $SE = 0.13$ ,  $p < .001$ , for males and  $\beta = .24$ ,  $SE = 0.18$ ,  $p = .11$ , for females. Effect sizes for final models for risky behaviors were  $R^2 = .06$  for females, and  $R^2 = .18$  for males. Effect sizes for final models for worries were  $R^2 = .02$  for females, and  $R^2 = .17$  for males.

## HO 2: Support Seeking Impact as a Moderator of Bi-directional Associations between Daily Worries and Daily Risky Behaviors

Table 3 presents results of final models testing interactive effects of daily worries and support seeking on next-day risky behaviors (Hypothesis 2a) and of the interactive effect of risky behaviors and support seeking on next-day worries (Hypothesis 2b).

**HO 2a.**—Multilevel path analyses showed that support seeking moderated the spillover of worries to next-day risky behavior for the whole sample,  $\beta = -.19$ ,  $SE = 0.05$ ,  $p < .001$ . We decomposed the interaction through follow-up simple slopes analyses testing the associations between worries and next-day risky behaviors at a same-day positive impact of support seeking score = 2, (*‘good impact’*) versus a negative impact of support seeking score = -2 (*‘negative impact’*). As hypothesized, positive impact buffered the worry-risky behavior link such that worries no longer are significantly associated with next-day risky behaviors,  $b = -0.07$ ,  $SE = 0.06$ ,  $p = .29$ . However, the association between worries and next-day risky behaviors remained significant when adolescents reported that seeking support had a negative impact,  $b = 0.31$ ,  $SE = 0.06$ ,  $p < .001$ . No gender effects emerged for the moderator effect for worries predicting next-day risky behaviors,  $\chi^2 = 3.17$  (1),  $p = .07$ , or for the effect of worries on next-day risky behaviors,  $\chi^2 = 1.5$  (1),  $p = .22$ .

**HO 2b.**—In testing daily impact of support seeking as a moderator of risky behaviors to next-day worries, the interaction between risky behaviors and support seeking approached significance for the whole sample and was significant for males and females in parallel models. Multi-group analyses did not show a gender moderation effect on the interaction term,  $\chi^2 = 2.4$  (1),  $p = .12$ , on support seeking,  $\chi^2 = 2.2$  (1),  $p = .14$ , or on the auto regression associations for worries,  $\chi^2 = 1.2$  (1),  $p = .27$ . However, a gender moderation effect emerged for the direct effect of risky behaviors on next day worries,  $\chi^2 = 12.03$  (1),  $p < .001$ , which was significant and positive for males, but not females. As shown in Figure 1, we probed the interaction for males and females, separately, for positive support seeking impact (score of 2) and for negative impact (score of -2): Risky behaviors predicted more worries on the next day in the context of negative impact (score of -2) for both males,  $b = 1.32$ ,  $SE = 0.11$ ,  $p < .001$ , and females,  $b = 0.57$ ,  $SE = 0.11$ ,  $p < .001$ . In the context of positive impact (score of 2), risky behaviors predict less worries for females,  $b = -1.23$ ,  $SE = 0.11$ ,  $p < .0001$ , but not for males,  $b = -0.18$ ,  $SE = 0.11$ ,  $p = .11$ .

## Discussion

This study is the first to examine important reinforcing links between worries and risky behaviors – two key phenomena in adolescents’ adjustment—within a given day and from one day to the next. In partial support for the direct effects model (HO 1), we found the hypothesized same-day associations between worries and risky behaviors and, as we anticipated, through cross-lagged models, also found across-day associations from daily worries on one day to risky behaviors on the next day for males but not for females. Direct effects from risky behaviors to next-day worries, however, did not emerge. The anticipated moderating effect of daily support seeking impact also was supported. In support of the buffering hypothesis, no next-day associations between worries and risky behaviors were

found for adolescents reporting positive impact (HO 2a), although the associations were significant for those reporting negative daily impact. Similarly, in the opposite direction, risky behaviors led to next-day worries for adolescents with negative support seeking impact but not for adolescents with positive impact (HO 2b). Also for females reporting positive support seeking, risky behaviors were negatively associated with next-day worries. Although there is a tendency to describe ‘risk-taking’ or ‘worrying’ as invariant characteristics in youth, data from the present study demonstrate the importance of identifying antecedents of these behaviors as they vacillate across time.

### **Adolescent Worries in Everyday Life**

In addition to examining the specific hypotheses, this study provides information about adolescents’ worries and thereby provides information about the types of normative stressors in adolescents’ daily lives. By probing a broad array of worries over 10 consecutive days, our data highlight worry as a prominent cognitive process for both females and males. In line with prior findings (de Matos et al., 2013; Fournier et al., 1996), approximately 25% of the sample reported that their worries sometimes reach an intense level. Also in line with prior survey studies, the most common worries were about personal matters, such as academics, appearance, and money. Only three of 26 worries assessed showed gender differences: Females worried more about their appearance and dating relationships, as was reported elsewhere (e.g., Brown et al., 2006; Gallagher & Millar, 1998), and males worried more about ‘being hassled by the police,’ perhaps not unexpectedly for an urban, ethnically diverse sample of adolescent males.

### **Same-Day Associations between Worries and Risky Behaviors**

For both males and females, worries and risky behaviors tended to co-occur. Although worries previously have been associated with internalizing behaviors such as anxiety and depression, these results also show the connection between worries and externalizing symptoms, such as acting out and rule-breaking behaviors. Though worries and risky behaviors, as assessed here, are not presumed to be evidence of psychiatric symptoms, the co-occurrence of divergent mental health symptoms in adolescents is well-documented (e.g., Chen, Killeya-Jones, & Vega, 2005). What is unique about these results is the demonstration of temporal links between two indicators of different types mental health concerns. Also, although there may be third variables, such as social anxiety or attention deficit disorders, that underlie both the worries and the risky behaviors, those individual characteristics do not account for the co-variation within days.

Within day co-variation suggests that worries and risky behaviors may be catalysts for each other in the course of a day. Such co-variation may be due to a common external trigger for both, e.g., argument with a friend or some type of bad news, or internal triggers, e.g., stress hormone fluctuations associated with increased emotionality or negative mood, although it should be noted that our findings held even when controlling for same-day negative mood. Since our data were collected once per day, at night, we cannot discern the direction of effects within a day. It is possible that the natural timing and topography of worries and risky behaviors play a role in the direction of within day effects, e.g., some adolescents might worry more in the morning (especially on a school day) whereas others may worry late at

night when they are alone. Likewise, some risky behaviors are more likely in the company of friends whereas others are more likely when alone. Contextual factors, such as time of day and presence of others, are recommended as important variables to better understand adolescent worries.

### **Worries to Next-Day Risky Behaviors**

The results here clearly indicate that worries enhance more than diminish the likelihood of risky behaviors. Showing daily links from worries to next-day risky behaviors suggests that adolescents may turn to risky behaviors as a strategy to cope with the discomfort and irritability that accompany worries. It would not be surprising at this developmental stage that risky behaviors, such as substance use, risky sex, or delinquent acts, could be perceived as an antidote to worries. Adolescents, in particular, tend to be more sensitive to short-term gain, to make more impulsive decisions, and to be more susceptible to peer influences (Steinberg, 2007). Thus, these results might be specific to adolescents, as they are usually considered to be less risk adverse than adults (Barbalat, Domenech, Vernet, & Fournier, 2010). More generally, a developmental perspective on the emergence of worries and risky behaviors would contribute to our understanding of the link between them, e.g., did one or the other of these behavioral patterns start to develop at an earlier age? If we had a larger sample, it also would be helpful to know what types of risky behaviors were exhibited, as different types of risky behaviors have different effects on physiological arousal and on repetitive thought processes.

The across-day direct effect from worries to risky behaviors was significant only for males, which may reflect two converging male-female differences in our data: First, males' daily worries show strong positive associations across days, and, second, their worries are significantly associated with overall levels of depression and anxiety. Thus, although males do not report more worries overall, their daily worries may be indicative of more consistent processes. Our data align with the Auerbach et al. (2012) finding that males' anxiety symptoms predict more risky behaviors; perhaps risky behaviors are more of a gender-typical response to males' concern, self-doubt, or apprehension. Moreover, our data cannot be used to conclude that females' worries do not spill over across days to influence risky behaviors—especially since the buffering effect of positive support seeking was found for both females and males. Thus, under the specific circumstance of worry occurring on the same day with negative interpersonal interactions, increased risky behavior was evidenced on the next day for both males and females. In addition, although we assessed broad-based risky behaviors, we did not include several self-harm behaviors, specifically cutting and disordered eating, both of which tend to be more common among females (e.g., Møhl, la Cour, & Skandsen, 2014). On the positive side, the weak auto-regressive association in worries across days for females suggests that females may have better abilities to attenuate their worries from day-to-day, or that their worries may be more strongly grounded in immediate events. Additional research is needed to better understand gender differences in responses to worries, with attention to how worries relate to cognitive (e.g., Esbjørn et al., 2015), emotional, and physiological factors (e.g., Ottaviani et al., 2015) that may mitigate these links, as well as links to contemporaneously stressful events.

## Risky Behaviors to Next-Day Worries

In contrast to what we expected, there was no evidence that risky behaviors directly provoke or attenuate next-day worries. Considerable research on the adolescent brain with respect to risk-taking shows heightened sensitivity to reward (Galván, 2013), particularly social rewards (Albert, Chein, & Steinberg, 2013), and less mature cognitive control systems (Casey & Caudle, 2013). Adolescent brains thus are programmed, through normative changes, to promote experimentation and social connectedness and, accordingly, risky behaviors can accrue significant benefits—on mood, peer acceptance, and self-image. Moreover, although the concerns salient to adults surrounding risky behaviors may be less worrisome overall for adolescents, certain types of risky behaviors, such as unprotected sex, may still be associated with worry under specific circumstances, for example, if a female starts to suspect she might be pregnant. Worries, however, may escalate over an extended time frame rather than just one day following the risky behavior. Thus, greater delineation among specific types of risky behaviors, in terms of their long-range negative consequences, might sharpen our understanding of the conditions under which risky behaviors actually do precipitate worries.

## Support Seeking Impact as a Moderator

Including daily impact of support seeking further clarified the nature of the next-day associations between worries and risky behaviors and is consistent with previous findings on the salutary effect of positive support seeking on both worries (Brown et al., 2006) and risky behaviors (e.g., Soenens, Vansteenkiste, Luyckx, & Goossens, 2006). Positive support seeking buffered the link from worries to next-day risky behaviors and the link between risky behaviors and next-day worries only was found for females and males who reported negative support seeking. Moreover, for females reporting positive support seeking, risky behaviors actually predicted fewer worries on the next-day. Thus, positive interactions with friends and family members appear to contain some of the reverberating effects between worries and risky behaviors. Based on our specific items, we cannot address the question of whether the buffering effect was primarily due to interactions with friends versus interactions with family members. It is worth noting that our data show that, for most teens on most days, interacting in some fashion (talking, texting etc.) about daily concerns is perceived positively. However, the significant associations between worries and risky behaviors for the handful of occasions when impact scores were around or below zero suggest a double-whammy effect associated with negative support seeking: When talking with others makes adolescents feel badly, there is a greater likelihood that, if worried, they will turn to risky behaviors. Similarly, when adolescents report negative experiences when talking with others about everyday concerns, risky behaviors then lead to next-day worries. These data highlight both the positive and negative implications of talking to others in the emotional well-being and decision-making of adolescents.

## Study Limitations

Several limitations of this study must be noted. First, because the assessments occurred once per day, we do not have information about the sequencing of events within a day. To clarify within day influences, multiple assessments across the day, e.g., through ecological

momentary assessments, are recommended. Second, although the cross-lagged panel models, which also controlled for within-day effects, provide a reasonably strong test of directional influences from one day to the next, causal relations cannot be proven. Third, support seeking was tested as a moderator but could also serve as a mediator. That is, some adolescents may be less likely to turn to others with their worries or may benefit less from communication; not having interpersonal support as a resource, those teens might then turn to risky behaviors as maladaptive coping strategies. Fourth, we used an averaged score across a wide array of worries to reflect amount of worries; however, other ways to operationalize worries, such as time spent worrying, or the number of worry episodes per time frame (e.g., Brosschot & Van Der Doef, 2006), might better capture worry intensity or the incapacitating nature of worries. Relatedly, using a wide-ranging list of worries helps frame the scope of potential worries, but this assessment strategy also can dilute the impact of any one particularly pervasive worry. Fifth, though ethnically diverse, our sample represents an urban community; the types of worries reported generally appear in line with other adolescent samples but greater attention to race and SES in larger samples could be better characterize the nature of adolescent worries. Sixth, although worries can be regarded as a dimensional phenomenon (Ehring & Watkins, 2008) and risky behaviors are common among non-clinical population (Centers for Disease Control, 2011), results from this community sample may not generalize to clinical samples. Additional research is needed to test whether worries and risky behaviors are similarly linked in clinical populations and whether linkages evidenced here contribute to more global future outcomes in psychological and behavioral adjustment.

### Implications and Conclusions

By investigating within-person, daily processes, this study showed within-day and across-day linkages between adolescents' worries and risky behaviors, and how the interpersonal variable of support seeking further clarified this linkage. These results ultimately have implications for interventions with adolescents, where we typically target micro-level, daily processes and behaviors toward the ultimate goal of improving macro-level outcomes such as overall well-being. Our data perhaps highlight several warning signs. For example, an adolescent's risky behaviors, which may provoke more attention from adults than worries, could be a signal of an adolescent's internal distress. Determining whether worries play a role in adolescents' risky behaviors could inform a more constructive response to the risky behaviors. These data also highlight the important role of positive support seeking, which obviously is a familiar message, but is indicated here in a new way.

Both worries and risky behaviors, in due measure, are normative adolescent phenomena. Yet, at heightened levels, worries can become debilitating and risky behaviors can be dangerous. In light of our data indicating reinforcing patterns between the two, recognizing and interrupting feedback loops between worries and risky behaviors becomes an important consideration for all stakeholders in adolescents' well-being: adolescents themselves, parents, educators and clinicians. Idiographic monitoring of daily worries, risky behaviors, and support seeking could inform evidence-based treatment planning. More generally, promoting awareness about the link between worries and risky behaviors could guide those adults and peers who are concerned about an adolescent's worries or risky behaviors.

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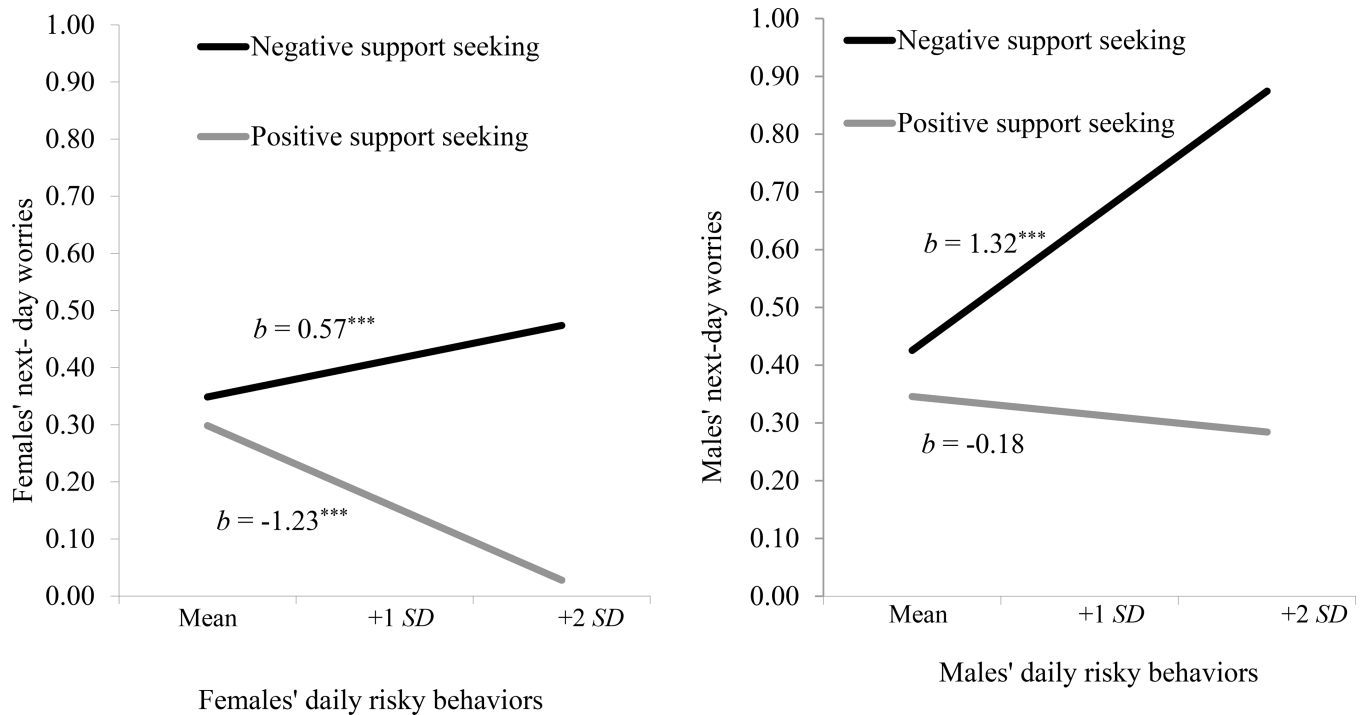
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**Figure 1.**

Support seeking impact as a moderator between daily risky behaviors and next-day worries for females and for males. Positive impact = 2; Negative impact = -2. Coefficients represent simple slopes.  $b$  = unstandardized coefficients. Intercepts and the paths from support seeking to the next-day worries, from worries to the next day worries, and the interaction terms are equated across genders.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 1.**

## Descriptive Statistics for Worries

Item	<i>M (SD)</i> <sup>a</sup>	% of sample <sup>b</sup>	% of days <sup>c</sup>
Today, how much did you worry about...			
Your appearance *	0.65 (0.84)	83.5	44.70
Money problems	0.67 (0.98)	77.7	38.70
An upcoming event	0.49 (0.83)	75.7	31.80
Your relationship with a friend	0.48 (0.80)	71.8	31.80
Grades or school	0.59 (0.92)	69.9	35.20
Your health	0.43 (0.77)	69.9	29.40
Your mom or someone like your mom	0.35 (0.73)	63.1	23.20
Some activity, such as a sports, music, dance or drama performance	0.31 (0.67)	58.3	21.30
Your brother or sister	0.31 (0.66)	55.9	21.80
Your dad or someone like your dad	0.33(0.70)	53.7	21.90
Your relationship with a boyfriend or a girlfriend*	0.34 (0.74)	53.4	22.20
Another family member	0.26 (0.65)	48.5	16.70
Being center out of something you want to do	0.23 (0.60)	47.6	15.20
Your parents finding out that you messed up in some way or did something they don't approve of	0.19 (0.57)	39.8	12.70
Something you heard	0.18 (0.53)	38.8	12.20
The safety of someone else	0.16 (0.49)	36.9	11.80
Something you read	0.12 (0.48)	33.0	9.50
Your safety or being in a physically dangerous situation	0.10 (0.38)	25.2	7.40
Your own health or health habits (smoking, alcohol, drugs, eating)	0.15 (0.53)	25.2	8.70
Hanging out with friends who could get me into trouble	0.06 (0.27)	22.3	4.80
Being hassled by police*	0.06 (0.27)	21.4	4.80
Someone else's health or health habits (smoking, alcohol, drugs, eating)	0.11 (0.48)	21.4	6.20
Health or health habits (smoking, alcohol, drugs, eating) of your dad (or someone like a dad to you)	0.09 (0.44)	15.5	3.70
Sexually transmitted diseases or pregnancy	0.09 (0.37)	13.7	5.10
Health or health habits (smoking, alcohol, drugs, eating) of your mom (or someone like a mom to you)	0.07 (0.38)	12.6	3.40
Being teased or bullied	0.03 (0.21)	11.7	2.90

Note. *N* = number of observations across 102 participants. All minimum reported values were 0. The response option for worries items were as follows: 0 = *Not at all*, 1 = *A little*, 2 = *Somewhat*, 3 = *A lot*.

<sup>a</sup> Within-day means.

<sup>b</sup> % of sample reporting that worries on at least one day.

<sup>c</sup> % of total days that worries was reported.

\* Significant gender difference,  $p < .05$ .

**Table 2.**

Bivariate Correlations between Study Variables for Males (above diagonal) and Females (below diagonal)

Variable	1	2	3	4	5	6	7	8	
1. Worries <sup>a</sup>	---	.35 **	-.06	.26 **	-.23 **	-.09	.60 **	.47*	
2. Risky behavior <sup>a</sup>	.14 **	---	-.002	.15 *	-.01	-.17	.10	-.07	
3. Communication impact <sup>a</sup>	-.05	-.15	---	-.15 *	.08	.07	-.21	-.12	
4. Negative mood <sup>a</sup>	.45 *	.09	-.18 *	---	.04	-.22	.41 ***	.46 ***	
5. Numerical day of reporting	-.22 *	-.12	.03	-.12 *	---	.02	.01	.02	
6. Age	.08	-.06	-.06	-.13	-.03	---	-.10	-.08	
7. Anxiety	.07	-.01	.14	.47 ***	.03	.04	---	.67 ***	
8. Depression	.08	-.10	.03	.43 ***	.02	-.15 *	.60 ***	---	
Females	<i>M(SD)</i>	0.34 (0.31)	0.05 (0.11)	1.08 (0.74)	0.42 (0.51)	5.31 (2.83)	17.89 (1.00)	0.27 (0.46)	8.62 (6.69)
Males	<i>M(SD)</i>	0.31 (0.32)	0.08 (0.17)	0.97 (0.70)	0.41 (0.50)	5.25 (2.86)	18.08 (1.21)	0.26 (0.28)	5.79 (5.69)

Note. Multilevel correlations are calculated for associations involving daily-level variables.

<sup>a</sup> Within-day means representing the average per item per day.

<sup>b</sup> Reported in thousand dollars.

\*  $p < .05$ .

\*\*  $p < .01$ .

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

**Table 3**

Daily Support Seeking Impact, Worries, and Risky Behaviors: Lagged Main Effects and Interactions

Variable	Total Sample		Females		Males	
	$\beta$	SE	$\beta$	SE	$\beta$	SE
Risky Behavior (t +1)						
Intercept	0.88	0.09	1.27	0.14	0.67	0.21
Worries (t)	0.20 <sup>***</sup>	0.04	0.21 <sup>***</sup>	0.03	0.17 <sup>***</sup>	0.03
Risky behaviors (t)	0.27 <sup>***</sup>	0.06	0.19	0.15	0.31 <sup>***</sup>	0.12
Support Seeking impact (t)	0.16 <sup>***</sup>	0.06	0.26 <sup>***</sup>	0.07	0.08	0.06
Worries * support seeking impact (t)	-0.35 <sup>**</sup>	0.09	-0.45 <sup>**</sup>	0.13	-0.32 <sup>**</sup>	0.08
Worries (t +1)						
Intercept	1.00	0.06	1.48	0.21	1.20	0.19
Worries (t)	0.20 <sup>**</sup>	0.04	0.17 <sup>**</sup>	0.06	0.16 <sup>**</sup>	0.06
Risky behaviors (t)	0.16	0.14	-0.13	0.08	0.39 <sup>***</sup>	0.08
Support Seeking impact (t)	0.03	0.03	0.03	0.03	0.03	0.03
Risk * support seeking impact (t)	-0.21	0.12	-0.25 <sup>***</sup>	0.05	-0.37 <sup>***</sup>	0.10

*Note.*  $\beta$  = standardized coefficient; *SE* = standard errors. Results are presented for the entire sample and final multiple group models for gender. In the prediction of next-day risky behaviors intercepts, paths from worries to next day risky behaviors and interaction terms are equated across genders. In the prediction of next-day worries, intercepts and the paths from support seeking to the next-day worries, from worries to the next day worries, and the interaction terms are equated across genders. For the whole sample,  $R^2$  for next-day risky behaviors = .22,  $R^2$  for next-day worries = .30.

\*  $p < .05$ .

\*\*  $p < .01$ .

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