Article

An Investigation of Adolescents' Reported and Self-Perceived Risk-Taking

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Abstract

Adolescence is a sensitive period for taking risks, yet research has not investigated whether adolescents who engage in risk-taking actually *perceive* themselves to be risk-takers. In the current study, students (Grade: 6-8, $N = 437$) reported on their frequency of risk-taking and perceptions of themselves as risk-takers, forming four groups of interest (aware risk-takers, unaware risk-takers, aware non-risk-takers, unaware non-risk-takers). We also investigated whether these groups were associated with engagement in certain *types* of risks. Overall, low-risk-takers had more accurate self-perceptions (i.e., greater awareness) compared with high risk-takers. Of concern, unaware high risk-takers engaged in more rule-breaking and adventurous risks compared with non-risk-takers, though they did not consider themselves to be risk-takers. It is possible that this group of adolescents may be less receptive to educational practices that target high risk-takers given that they do not consider themselves to be a risk-taker.

Keywords

adolescents, risk-taking, self-perception, types of risk-taking

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Adolescence is considered to be a time of increased risk-taking (Casey & Caudle, 2013; Dahl, 2004; Ernst, 2014). Indeed, extensive research has indicated that the transition from childhood to adolescence is associated with increases in unintentional injuries and mortality rates (Casey & Caudle, 2013; Dahl, 2004). Most of the studies on adolescent risk-taking involve an assessment of how often adolescents engage in various risky behaviors. Researchers have not asked whether adolescents who take risks consider themselves to be risk-takers. A lack of awareness of being a risk-taker may lead some adolescents to not recognize the potential consequences associated with their behavior. In the current study, we investigate this issue by comparing adolescents' awareness of whether or not they are risk-takers to their frequency of engaging in risk-taking behaviors.

When examining the frequency in which adolescents engage in risky behaviors (e.g., cheating on a test, riding a bike without a helmet, skipping school, etc.; Kloep, Güney, Çok, & Simsek, 2009), researchers are able to differentiate between low risk-takers (i.e., individuals who rarely engage in risky behaviors) and high risk-takers (i.e., individuals who often engage in risky behaviors) but are not able to assess adolescents' self-perceptions. According to self-perception theory (Bem, 1972), individuals often develop perceptions about themselves based on their engagement in specific behaviors. For instance, an individual who consistently is tardy may infer from the frequency of this behavior that they are not a conscientious person (Wilson & Dunn, 2004). While no study has examined this comparison within adolescent risk-taking, past research in other domains suggests that adolescents' self-perceptions parallel behavior (e.g., popularity status; Putarek & Keresteš, 2016). For example, adolescents who rated themselves as more popular had higher popularity status compared with those who rated themselves as less popular (Mayeux & Cillessen, 2008). Similarly, it is likely that adolescents would use the frequency of their risk-taking behaviors to make conclusions about whether they consider themselves to be risk-takers (e.g., adolescents who engage in a lot of risk behaviors likely also *perceive* themselves to be risk-takers). Yet some adolescents may not use the frequency of their risk-taking behaviors to make conclusions about whether or not they are a risk-taker. Thus, it is important to distinguish between adolescents who are aware and unaware of their risk-taking behaviors.

A comparison of adolescents' awareness of whether or not they are risk-takers to their frequency of engaging in risk-taking behaviors could yield four different risk profiles: (a) aware risk-takers (high risk-takers who perceive themselves as risk-takers), (b) unaware risk-takers (high risk-takers who perceive themselves as non-risk-takers), (c) aware non-risk-takers (low risk-takers who perceive themselves as non-risk-takers), and (d) unaware

non-risk-takers (low risk-takers who perceive themselves as risk-takers). While frequent risk-takers receive the most attention, adolescent perceptions that are not in line with their reported behaviors also are of concern. Specifically, unaware risk-takers (high risk-takers who perceive themselves as non-risk-takers) may fail to recognize the risks and consequences associated with their risk-taking behaviors. This group would be especially difficult to target for intervention and education programs, given that they may not be receptive to information that seems irrelevant to them (i.e., education focused on decreasing risk-taking would seem irrelevant to a person who does not think they are a risk-taker). Critically, this group may be engaging in risky behaviors, yet fail to recognize the consequences associated with these actions. This information would be important for intervention initiatives given that some research has suggested that when individuals perceive behaviors as less risky (e.g., binge drinking), they engage in that behavior more often and are less likely to change their behavior (e.g., Carey et al., 2018; Simons & Arens, 2007). In addition, some adolescents have been found to underestimate risks associated with engaging in risky behaviors (e.g., smoking; Slovic, 2000; Virgili & Severson, 1991). Indeed, an unaware risk-taker may not associate certain behaviors with being risky (e.g., riding their bike without a helmet) and therefore engage in a high level of risks without considering themselves a risk-taker. Therefore, it is essential to compare adolescents' behaviors to their self-perceptions, to help identify different profiles of adolescent risk-takers (e.g., aware risk-takers, unaware risk-takers, etc.).

Whether adolescents perceive themselves as a risk-taker may also depend on the type of risks that they endorse. Researchers examining adolescent risk-taking tend to focus on more deviant risk behaviors (e.g., substance use: Hanson, Thayer, & Tapert, 2014; Mitchell et al., 2014; sexual risk-taking: Muehlenkamp, Peat, Claes, & Smits, 2012; Sipsma, Ickovics, Lin, & Kershaw, 2013; dangerous driving: Centifanti, Modecki, MacLellan, & Gowling, 2016). There are, however, other types of risks that adolescents engage in (e.g., social risk-taking, rule-breaking risk-taking; Gullone, Moore, Moss, & Boyd, 2000; Kloep et al., 2009). Indeed, some researchers have highlighted that risk-taking is domain specific, suggesting that high engagement in a certain type of risk-taking (delinquency: e.g., *shoplifting*) does not necessarily suggest that an individual will take risks in other domains (social risks: e.g., *giving a speech;* Figner & Weber, 2011; Gonzalez et al., 1994; Kloep et al., 2009; Weber, Blais, & Betz, 2002). Thus, examining different types of risks is critical as this can provide insight into whether engagement in certain types of risks (e.g., social risks versus deviant risks) may influence adolescents' perceptions of whether they consider themselves a risk-taker.

Overall, the current study aims to compare adolescent's perceptions of themselves as a risk-taker (i.e., "self-perceived risk-taker" or "self-perceived non-risk-taker") to their self-reported engagement in risky behaviors (i.e., "high risk-taker" or "low risk-taker"). Given the lack of research directly comparing these methods, the analyses are exploratory. It is likely, however, that individuals who rarely engage in risky behaviors (i.e., "low risk-taker") would not consider themselves a risk-taker (i.e., "self-perceived non-risk-taker") given that they would be unable to recall instances of engagement in risky activities (i.e., making them an aware non-risk-taker). However, individuals who report engagement in more risky behaviors (i.e., "high risk-taker") may consider themselves a risk-taker (i.e., "self-perceived risk-taker"), given the variety of past risk-taking behaviors available to reflect on when forming self-perceptions (i.e., making them an aware risk-taker).

Adolescents' perceptions about their risk-taking also may depend on types of risk they engage in. For instance, individuals who engage in more deviant risky behaviors (e.g., shoplifting) may recognize that these behaviors are associated with greater consequences and therefore may be more likely to view themselves as risk-takers. Alternatively, adolescents may view more normative risks (e.g., social risks) as necessary, associating them with fewer or less severe consequences. Therefore, these individuals may fail to use these behaviors in their evaluation of themselves a risk-taker and thus perceive themselves as a non-risk-taker. Taken together, we predict that adolescents who do not engage in risky behaviors will not perceive themselves as a risk-taker. Furthermore, individuals who engage in more frequent and deviant risky behaviors may be more likely to consider themselves a risk-taker compared with those who do not engage in such behaviors.

Method

Participants

The current sample consisted of 437 students in Grades 6-8 ($\bar{X}_{age} = 12.35$, $SD = 0.95$; 52.3% female) from several elementary schools in southern Ontario, Canada. This sample was drawn from a larger study (including students from Grade 3-8) examining the relationship between well-being and youth health-risk behaviors. Given that some of the measures in our study (e.g., self-perceived risk-taking and some deviant risk-taking behaviors) were not appropriate for the younger children, only participants in Grades 6, 7, and 8 were included in the current study. In our sample, 96.5% of participants were born in Canada. The most common races among our sample included 85.9% White, 6.1% Latin American/Hispanic, 5.2% Black, 3.1%

Indigenous, and 2.1% Filipino. Mean levels of parental education fell between "some college, university, or apprenticeship program" and "completed a college/apprenticeship and/or technical diploma."

Procedure

Students completed surveys relating to health and well-being within their classrooms. Trained research assistants administered the surveys to all students. Teachers remained in the room but completed other tasks while the survey took place. All students were provided with a cardboard exam divider to help provide privacy during the survey. The survey took approximately 1 hour to complete. Participants received gifts (e.g., pencils, backpacks, etc.) as compensation for their participation. The University Ethics Board approved the study, and all participants had consent from their parents and gave informed assent before completing the survey.

Measures

Risk-taking engagement. The frequency of risk-taking engagement was assessed by asking students the extent to which they engaged in 33 risky behaviors in the past year (e.g., rode a bike without a helmet, cheated on a test, skipped school without permission, etc.). To generate a list of risky behaviors, we took a youth-centered approach to research and asked a Youth Engagement Committee to help create a list of risky behaviors. Of note, many of these risk-taking behaviors overlap with behaviors generated from other studies (e.g., Gonzalez et al., 1994; Gullone et al., 2000). Response options ranged from 0 (*0 times*) to 4 (*10 or more times*). A sum of these behaviors was then created to assess how often participants engaged in risky behaviors.

Risk-taking self-perceptions. Self-perceived risk-taking was assessed using a question asking students "*Do you consider yourself to be a risk-taker?*" Participants responded to this question by answering either yes or no.

Results

Preliminary Analyses

To investigate whether the *types* of risks that individuals engaged in are associated with adolescents' perception of themselves as a risk-taker, a principal components factor analysis with promax rotation was conducted. Four

components were extracted with eigenvalues between 1.494 and 7.741. The factor scores for each of these factors were saved using the regression method in SPSS. This created four variables that reflected an individual's score on each of the factors (see Table 1 for results from the factor analysis). Factor 1 (rule-breaking risks) encompassed 13 items (e.g., lied to parent, cheated on a test, broke a school rule; **e**igenvalues = 7.814) with factor loadings ranging from .407 to .839. Factor 2 (adventurous risks) was comprised of nine items (e.g., climbing trees, did something dangerous on playground equipment, went mountain biking; eigenvalues = 2.045) with factor loadings ranging from .325 to .661. Factor 3 (deviant risks) was comprised of four items (i.e., sneaking out at night, went to a rave or bush party, shoplifted, skipped school; eigenvalues = 1.721) with factor loadings ranging from .494 to .767. Factor 4 (social risks) was comprised of four items (i.e., asked someone to go to a school dance as a date, went to a school dance, went to parties, gave a speech; eigenvalues = 1.457) with factor loadings ranging from .436 to .773. Alphas for risk behaviors were .70 for deviant behaviors, .86 for rule-breaking behaviors, .71 for adventurous behaviors, and .51 for social behaviors (note that we would not expect adolescents to engage in every behavior, so high reliability was not expected).

Risk-Taking Profiles

To compare whether individuals who engage in a lot of risky behaviors also have a self-perception of themselves as risk-takers, we categorized risk-taking behaviors into two extreme groups: low risk-takers (bottom 33%) and high risk-takers (top 33%). This allowed us to investigate whether (a) self-perceived risk-takers engage in a lot of risk-taking behaviors and (b) self-perceived non-risk-takers engage in few risk-taking behaviors. In total, 33.9% of the sample considered themselves to be risk-takers. On average, individuals in the high risk-takers group had a sum of 39.42 risk-taking behaviors, while those in the low risk-takers group had a sum of 9.81 risk-taking behaviors. A chi-square test indicated a significant relationship between risk-taking behaviors (low vs. high) and perceptions of oneself as a risk-taker (no vs. yes); $\chi^2(1) = 70.83$, $p < .001$. Furthermore, all four cell counts differed significantly from expectation (i.e., ps $< .05$), as indicated by standardized residuals larger than 1.96 in absolute magnitude in each cell (see Table 2). Specifically, low risk-takers ($n = 159$) were significantly more likely to perceive themselves as non-risk-takers than as risk-takers (85.5%, confidence interval [CI] = [0.791, 0.906] vs. 14.5%, CI = [0.094, 0.209], respectively), whereas high risk-takers ($n = 144$) were significantly more likely to perceive themselves as risk-takers than as non-risk-takers (61.1%,

Table 1. Factor Analysis Results.

	Rule breaking	Adventure	Deviant	Social
Told a lie to one of your parents	.839	−.219	−.102	.118
Told a lie to one of your teachers	.811	−.260	.033	.096
Broke school rules	.787	−.016	.002	−.141
Cheated on a test	.750	−.336	−.100	−.068
Rode in a car without a seatbelt	.613	.035	.099	−.083
Stayed up past bedtime without permission	.602	.110	−.051	.022
Texted during class	.566	−.149	.027	.198
Wrecked other peoples' property	.565	−.025	.055	−.078
Played somewhere where you were not allowed	.469	.244	.138	.007
Broke you parents' rule just to see if you could get away with it	.468	.095	.126	.053
Teased unfamiliar animals (e.g., a dog)	.460	.085	−.192	−.201
Road a bike or skateboarded without a helmet	.449	.336	.008	−.095
Attended a movie for which you were underage	.407	.195	.167	.091
Climbed trees	.046	.661	−.067	.063
Went rollerblading	−.212	.639	−.166	−.055
Went mountain biking	−.205	.603	.020	.001
Did something dangerous on playground equipment	.344	.566	−.089	−.138
Raced on a bike or a boat	−.147	.450	.159	.039
Jumped off a bridge into water	.129	.433	.202	.026
Did something risky or dangerous on a dare	.387	.417	.210	−.063
Dove in the shallow end of a pool	.257	.325	−.199	.297
Gave personal information to a stranger online	.300	−.306	.183	.041
Went swimming alone	.238	.270	.000	.249
Snuck out at night while your parents thought you were asleep	.059	.029	.767	.087
Went to raves/bush party	−.001	.000	.765	−.116
Shoplifted	−.054	−.012	.745	.123
Skipped school without permission	.107	−.133	.494	−.161
Went to an underage youth dance club	−.190	.138	.224	.104
Went to a school dance	−.104	.110	−.111	.773
Asked someone to go with you to a school dance as a date	−.140	−.121	.125	.707
Went to parties	.022	−.041	.202	.491
Gave a speech in front of other people	.234	.034	−.307	.436

Table 2. Chi-Square Table.

	Do you consider yourself to be a risk-taker?		
Risk engagement	Yes	No	Total
Low	23	136	159
Expected	58.2	100.8	
Total %	7.6	44.9	
Standard residuals	−4.6	3.5	
High	88	56	144
Expected	52.8	91.2	
Total %	29.0	18.5	
Standard residuals	4.9	−3.7	
Total	111	192	303

Note. Standard residuals +/− 1.96 indicate a value significant at $p < .05$.

CI = [0.526, 0.691] vs. 38.9%, CI = [0.309, 0.474], respectively). As indicated by the non-overlapping 95% CIs, the low risk-takers were significantly more likely to perceive themselves as non-risk-takers (85.5%, CI = [0.791, 0.906]) than the high risk-takers were to perceive themselves as risk-takers (61.1%, CI = [0.526, 0.691])—suggesting that the low risk-takers may be more aware of their risk-taking (i.e., had self-perceptions that were more consistent with their behavior), than the high risk-takers.

Based on the chi-square analysis, we created four risk profiles: aware risk-taker (high risk-takers who also perceives themselves as risk-takers), unaware risk-taker (high risk-takers who do not perceive themselves as risk-takers), aware non-risk-taker (low risk-takers who perceive themselves as non-risk-takers), and unaware non-risk-taker (low risk-takers who perceive themselves as risk-takers). See Table 3 for breakdown of how often individuals from each risk profile endorsed engagement in the 33 risky behaviors.

Gender Differences

A logistic regression was run with risk perceptions (i.e., the frequency of reporting yes [vs. no] to the question "Do you consider yourself to be a risk-taker?") as the dependent variable and gender (male/female) as the independent variable. The overall model was not significant, $\chi^2(1) = 2.693$, $p = .101$; the odds of reporting being a risk-taker was not significantly different between males and females, odds ratio (OR) = 1.498, $p = .102$.

A multinomial logistic regression also was run with risk profile (aware risk-takers, unaware risk-takers, aware non-risk-takers, unaware non-risk-takers) as

Table 3. Percent of Adolescents Engaging in Risky Behaviors Within Each Risk Profile.

	Aware N-RT	Unaware N-RT	Unaware RT	Aware RT
Told a lie to one of your parents	58.1	69.6	96.4	93.2
Told a lie to one of your teachers	8.1	4.3	71.4	75.0
Broke school rules	26.5	30.4	83.9	90.9
Cheated on a test	5.9	21.7	33.9	31.8
Rode in a car without a seatbelt	29.4	17.4	78.6	78.4
Stayed up past bedtime without permission	55.1	60.9	94.6	95.5
Texted during class	10.3	21.7	62.5	56.8
Wrecked other peoples' property	4.4	4.3	26.8	37.5
Played somewhere where you were not allowed	5.1	13.0	64.3	69.3
Broke you parents' rule just to see if you could get away with it	25.0	39.1	75.0	87.5
Teased unfamiliar animals (e.g., a dog)	6.6	4.3	23.2	21.6
Road a bike or skateboarded without a helmet	33.1	39.1	89.3	93.2
Attended a movie for which you were underage	17.6	26.1	73.2	84.1
Climbed trees	46.3	65.2	82.1	95.5
Went rollerblading	24.3	26.1	41.1	48.9
Went mountain biking	16.9	13.0	48.2	50.0
Did something dangerous on playground equipment	19.9	39.1	66.1	87.5
Raced on a bike or a boat	43.4	52.2	66.1	81.8
Jumped off a bridge into water	2.2	17.4	19.6	50.0
Did something risky or dangerous on a dare	13.2	26.1	58.9	88.6
Dove in the shallow end of a pool	8.1	4.3	51.8	63.6
Gave personal information to a stranger online	5.1	0.0	10.7	12.5
Went swimming alone	22.1	34.8	69.6	78.4
Snuck out at night while your parents thought you were asleep	0.7	0.0	7.1	23.9
Went to raves/bush party	0.0	0.0	1.8	10.2
Shoplifted	0.0	0.0	5.4	13.6
Skipped school without permission	0.0	4.3	7.1	9.1
Went to an underage youth dance club	0.7	4.3	3.6	6.8
Went to a school dance	45.6	47.8	73.2	69.3
Asked someone to go with you to a school dance as a date	5.1	8.7	7.1	18.2
Went to parties	34.6	47.8	71.4	75.0
Gave a speech in front of other people	77.2	73.9	91.1	92.0

Note. N-RT = non-risk-taker; RT = risk-taker.

Table 4. Gender Differences Among the Risk Profiles.

	Aware non-risk-taker	Unaware non-risk-taker	Unaware risk-taker	Aware risk-taker
Males	48.1% [0.395, 0.569]	8.2% [0.041, 0.141]	20% [0.136, 0.277]	23.7% [0.168, 0.318]
Females	40.5% [0.327, 0.488]	7.9% [0.041, 0.133]	18.3% [0.125, 0.254]	33.3% [0.259, 0.414]

Note. 95% confidence intervals are shown in square brackets beneath the percentages. Non-significant differences are indicated by overlapping confidence intervals.

the dependent variable and gender as the independent variable (see Table 4 for the distribution of gender among the risk profiles). Given our interest in unaware risk-takers, this profile was used as the reference group. The overall model was not significant, $\chi^2(3) = 3.395$, $p = .335$; the odds of being in the aware risk-taker, aware non-risk-taker, or unaware non-risk-taker profile, in comparison to the unaware risk-taker profile, were not significantly different between males and females (ORs = 0.652, 0.951, and 1.087, respectively, ps $> .05$).

Types of Risk-Taking Behaviors

We were also interested in whether the types of risks taken by adolescents are related to their awareness of whether they are risk-takers (i.e., consistency between individuals' engagement in risky behaviors and their perceptions of themselves as a risk-taker). Of note, the means used in these comparisons represent the factor scores, such that higher positive scores represent a higher degree of endorsement for that risk-taking type (see Table 5).

Deviant risks. First, to assess if there were differences among the four profiles on deviant risk behaviors, a one-way analysis of variance (ANOVA) was performed with risk profile (aware risk-taker, unaware risk-taker, aware non-risk-taker, unaware non-risk-taker) as the between-subjects variable, and factor scores for deviant risk behaviors as the dependent variable. There was a significant main effect of risk profile, $F(3, 299) = 15.530$, $p < .001$, $\eta_p^2 = .135$. Post hoc comparisons using Tukey's honestly significant difference (HSD), revealed that aware risk-takers ($\bar{X} = 0.724$, $SD = 1.949$, CI [0.311, 1.137]; i.e., high risk-takers who also perceive themselves to be risk-takers) had significantly higher scores on the deviant risk factor compared to all other profiles (ps $< .002$). There were no other significant differences between the other profiles, ps $> .05$.

Table 5. Means (and Standard Deviations) for Risk Profile as a Function of Condition.

	Risk profile			
	Aware risk-takers	Unaware risk-takers	Aware non-risk-taker	Unaware non-risk-taker
Deviant risks	0.724_a (1.949)	-0.084_b (0.499)	-0.254_b (0.233)	-0.201_b (0.223)
Rule-breaking risks	1.261_a (1.002)	0.751_b (0.748)	-0.790_c (0.321)	-0.731_c (0.343)
Adventurous risks	1.244_a (1.103)	0.347_b (0.799)	-0.738_c (0.417)	-0.619_c (0.396)
Social risks	0.707_a (1.280)	0.622_a (1.164)	-0.452_b (0.556)	-0.486_b (0.526)

Note. Means represent factor scores. Standard deviations are presented in brackets. Significant differences across conditions are represented by letter subscripts that do not match (across rows), non-significant differences are represented by matching letter subscripts.

Rule-breaking risks. Next, to assess whether there were differences among the four profiles on rule-breaking behaviors, a one-way ANOVA was performed with risk profile (aware risk-taker, unaware risk-taker, aware non-risk-taker, unaware non-risk-taker) as the between-subjects variable, and factor scores for rule-breaking risk behaviors as the dependent variable. There was a significant main effect of risk profile, $F(3, 299) = 196.869$, $p < .001$, $\eta_p^2 = .664$. Post hoc comparisons using Tukey's HSD revealed that high risk-takers (aware risk-taker, $\bar{X} = 1.261$, $SD = 1.002$, CI = [1.049, 1.474]; and unaware risk-taker, $\bar{X} = 0.751$, $SD = 0.748$, CI = [0.551, 0.951]) had significantly higher scores on rule-breaking risks compared with low risk-takers (aware non-risk-taker $\bar{X} = -0.790$, $SD = 0.321$, CI = [−0.844, −0.735]; and unaware non-risk-taker, $\bar{X} = -0.731$, $SD = 0.343$, CI = [−0.879, −0.583]), $p < .001$. Furthermore, aware risk-takers were significantly higher on rule-breaking risks compared with unaware risk-takers ($p < .001$). There were no significant differences between the two low risk-taking profiles ($p = .980$).

Adventurous risks. To assess differences among the four profiles on adventurous behaviors, a one-way ANOVA was performed with risk profile (aware risk-taker, unaware risk-taker, aware non-risk-taker, unaware non-risk-taker) as the between-subjects variable, and factor scores for adventurous risk behaviors as the dependent variable. There was a significant main effect of risk profile, $F(3, 299) = 133.641$, $p < .001$, $\eta_p^2 = .573$. Post hoc comparisons using Tukey's HSD revealed that high risk-takers (aware risk-takers, $\bar{X} = 1.244$, $SD = 1.103$, CI = [1.010, 1.478]; and unaware risk-takers, $\bar{X} = 0.347$,

$SD = 0.799$, CI = [0.133, 0.561]) were significantly higher on adventurous risks compared with low risk-takers (aware non-risk-takers, $\bar{X} = -0.738$, $SD = 0.417$, CI = [−0.809, −0.667], and unaware non-risk-takers, $\bar{X} = -0.619$, $SD = 0.396$, CI = [−0.790, −0.448], $p < .001$). Furthermore, aware risk-takers were significantly higher on rule-breaking risks compared with unaware risk-takers ($p < .001$). There were no significant differences between the two low risk-taker profiles ($p = .896$).

Social risks. Finally, to assess whether there were differences among the four profiles on social risk behaviors, a one-way ANOVA was performed with risk profile (aware risk-taker, unaware risk-taker, aware non-risk-taker, unaware non-risk-taker) as the between-subjects variable, and factor scores for social risk behaviors as the dependent variable. There was a significant main effect of risk profile, $F(3, 299) = 36.574$, $p < .001$, $\eta_p^2 = .268$. Post hoc comparisons using Tukey's HSD, revealed that high risk-takers (aware risk-takers, $\bar{X} = 0.707$, $SD = 1.28$, CI = [0.436, 0.978], and unaware risk-takers, $\bar{X} = 0.622$, $SD = 1.164$, CI = [0.311, 0.934]) were significantly higher on social risks compared with low risk-takers (aware non-risk-takers, $\bar{X} = -0.452$, $SD = 0.556$, CI = [−0.547, −0.358], and unaware non-risk-takers, $\bar{X} = -0.486$, $SD = 0.526$, CI = [−0.714, −0.258], $p < .001$). There were no significant differences between the two high risk-taker profiles ($p = .953$), or the two low risk-taker profiles ($p = .999$).

Discussion

The present study examined adolescents' awareness of their risk-taking behavior. Specifically, we were interested in whether adolescents' self-reported risky behaviors aligned with their perceptions of themselves as risk-takers (e.g., does an individual who takes a lot of risks perceive themselves as a risk-taker?). Overall, results revealed that low risk-takers were more aware of their risk-taking behavior (e.g., had self-perceptions that reflected their reported behavior), compared with high risk-takers. We also found, however, that accurate self-perceptions (e.g., concluding you are a risk-taker when you take frequent risks) were associated with the *type* of risks adolescents engaged in.

While previous studies have examined self-perceptions in other contexts (e.g., popularity status; Putarek & Keresteš, 2016), this was the first study to directly examine adolescent's self-perceptions of themselves as risk-takers. Consistent with our predictions, adolescents who engaged in fewer risky behaviors (low risk-takers) were more likely to perceive themselves as non-risk-takers (85.5%) than risk-takers (14.5%), while adolescents who engaged

in frequent risky behaviors (high risk-takers) were more likely to perceive themselves as risk-takers (61.1%) than as non-risk-takers (38.9%). Thus, low risk-takers demonstrated a higher level of awareness for their risk-taking profile (85.5% were aware), compared with high risk-takers (only 61.1% were aware). These findings suggest that low risk-takers made more accurate self-perceptions according to their reported behaviors. It is possible that low risk-takers were unable to recall as many instances where they engaged in risk-taking and therefore had little reason to consider themselves a risk-taker. Although 61% of high risk-takers considered themselves to be a risk-taker (i.e., aware risk-takers), this still left 39% of high risk-takers who considered themselves to be non-risk-takers (unaware risk-takers). This is concerning given that unaware risk-takers may not recognize the potential risks associated with their behavior and therefore may fail to take these risks into consideration when making self-perceptions. Importantly, as seen in Table 3, unaware risk-takers engage in frequent risky behaviors that may have serious consequences. Notably, unaware risk-takers are not only engaging in "minor" risks (e.g., rollerblading, climbing trees). Instead, we see that 78% have rode in a car without a seatbelt, 89% have rode a bike/skateboard without a helmet, 10% have given a stranger personal information online, and 26% have wrecked other people's property (see Table 3 for full results). Although aware risk-takers are engaging in these behaviors more frequently, it is striking to see that so many unaware risk-takers are taking risks with dangerous consequences, yet classifying themselves as a non-risk-takers. These findings suggest that despite engaging in actions that can have serious consequences (e.g., riding a bike without a helmet can lead to severe injuries), this group does not perceive themselves as risk-takers. Of concern, unaware risk-takers may be less receptive to educational programs and interventions focused on decreasing risk-taking as this information may seem irrelevant to this group of adolescents.

Given that unaware risk-takers are of high concern, it is essential to understand factors that influence adolescents' awareness. One factor that was found to be associated with adolescents' awareness of their risk-taking behavior was the types of risks that they engaged in. Using a factor analysis, we identified four different types of risks: deviant, rule-breaking, adventurous, and social risks. We found that aware risk-takers were more likely than all other risk profiles to endorse deviant, rule-breaking, and adventurous risk-taking behaviors. These results suggest that adolescents who endorse frequent risky behaviors across multiple types of risks are better able to classify themselves as risk-takers. Importantly, when assessing unaware risk-takers, these adolescents engaged in more rule-breaking and adventurous risks compared with the low risk-takers, though they were not significantly different on

deviant risk-taking behaviors. Therefore, while both unaware and aware risk-takers engage in a high frequency of risks overall, unaware risk-takers engage in few deviant risks. These findings suggest that adolescents appear to consider themselves risk-takers when they engage in deviant risks.

While unaware risk-takers are not engaging in deviant risks, they are engaging in other types of risks (e.g., rule-breaking) yet do not consider these behaviors risky. Given this finding, a targeted approach to risk-taking education may be beneficial. Specifically, first identifying distinct groups of risk-takers (unaware vs. aware) may be important given that these adolescents have different perceptions on what they consider risky and thus may respond differently to programs aimed at decreasing risk-taking. Additionally, we found that aware risk-takers and unaware risk-takers both endorse similar levels of social risks. Therefore, social risks may be a type of risk-taking that does not improve adolescents' awareness or help them to distinguish between whether or not they are a risk-taker (i.e., individuals who engage in a high number of social risks might not perceive themselves as a risk-taker).

This study has important strengths, including a large sample, differentiation between different types of risk-taking, as well as being the first study to investigate the alignment between adolescent risk-taking and their perceptions of themselves as a risk-taker. At the same time, the study has several limitations. First, generalizability may be limited given that the participants came from a relatively homogeneous sample of students. Second, it is likely that there are other third variables associated with why an individual might classify themselves as a risk-taker (e.g., if their friends perceive themselves as risk-takers) that were not included in the study. In addition, it is still not clear why some low risk-takers perceive themselves as risk-takers (unaware non-risk-takers). Although this was only 14.5% of the sample, future studies should examine this group further to better understand why some adolescents consider themselves risk-takers when they infrequently take risks. In addition, a single measure was used to assess participants self-perceptions of risk-taking. For the purposes of this study, we were interested in whether or not adolescents classify themselves as a risk-taker. This distinction was important because often studies will *classify* adolescents as either risk-takers (or not), thus having this dichotomized variable allowed us to directly investigate whether adolescents' perceptions of themselves as a risk-taker map onto researcher's classifications. Future research, however, might benefit from investigating this construct using multiple items or expanding the response options (e.g., "never a risk-taker," "somewhat a risk-taker," "often a risk-taker," and "always risk-taker").

The current study offers an initial investigation into the relationship between risk behaviors and self-perceived risk-taking. Future research may

benefit from investigating the influence of more specific factors, including the extent to which adolescents engage in each risk-behavior (e.g., occasionally vs. often), or the amount of risk involved in each behavior, to see how these distinctions are associated with self-perceptions of risk-taking. Of note, the current study was not able to ascertain the direction of effects for the relationship between self-perception of risk-taking and engagement in risky behaviors. Thus, it is unclear whether engagement in risky behaviors leads an individual to conclude that they are a risk-taker, or whether individuals who self-identify as a risk-taker are more open to taking risks—longitudinal studies are necessary before making assumptions about temporal order.

Taken together, these findings suggest that the relationship between risk-taking and self-perceptions of risk-taking is complex. Indeed, while 85.5% of low risk-takers perceived themselves as non-risk-takers, only 61% of high risk-takers perceived themselves as risk-takers. Therefore, when adolescents do not engage in risk-taking, they are quite good at classifying themselves as non-risk-takers. High risk-takers, however, were less likely to successfully classify themselves as risk-takers. Of concern are adolescents who engage in frequent risks yet do not perceive themselves as risk-takers (unaware risk-takers). Adolescents who lack this awareness may be less receptive to educational practices that target high risk-takers as they do not consider themselves to be a high risk-taker. Overall, these findings highlight that we can gain a deeper understanding of adolescent risk-taking by not only investigating how often adolescents engage in risky behaviors but also considering whether or not they perceive themselves as a risk-taker.

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References

Bem, D. (1972). Self-perception theory. *Advances in Experimental Social Psychology*, *6*, 1-62. doi:10.1016/S0065-2601(08)60024-6

Carey, K. B., Merrill, J. E., Walsh, J. L., Lust, S. A., Kalichman, S. C., & Carey, M. P. (2018). Predictors of short-term change after a brief alcohol intervention for mandated college drinkers. *Addictive Behaviors*, *77*, 152-159. doi:10.1016/j.addbeh.2017.09.019

Casey, B. J., & Caudle, K. (2013). The teenage brain: Self control. *Current Directions in Psychological Science*, *22*, 82-87. doi:10.1177/0963721413480170

Centifanti, L. C. M., Modecki, K. L., MacLellan, S., & Gowling, H. (2016). Driving under the influence of risky peers: An experimental study of adolescent risk taking. *Journal of Research on Adolescence*, *26*, 207-222. doi:10.1111/jora.12187

Dahl, R. E. (2004). Adolescent brain development: A period of vulnerabilities and opportunities—Keynote address. *Annals of the New York Academy of Sciences*, *1021*, 1-22. doi:10.1196/annals.1308.001

Ernst, M. (2014). The triadic model perspective for the study of adolescent motivated behavior. *Brain and Cognition*, *89*, 104-111. doi:10.1016/j.bandc.2014.01.006

Figner, B., & Weber, E. U. (2011). Who takes risks when and why? Determinants of risk taking. *Current Directions in Psychological Science*, *20*, 211-216. doi:10.1177/0963721411415790

Gonzalez, J., Field, T., Yando, R., Gonzalez, K., Lasko, D., & Bendell, D. (1994). Adolescents' perceptions of their risk-taking behavior. *Adolescence*, *29*, 701-709.

Gullone, E., Moore, S. M., Moss, S., & Boyd, C. (2000). The adolescent risk-taking questionnaire: Development and psychometric evaluation. *Journal of Adolescent Research*, *15*, 231-250. doi:10.1177/0743558400152003

Hanson, K. L., Thayer, R. E., & Tapert, S. F. (2014). Adolescent marijuana users have elevated risk-taking on the balloon analog risk task. *Journal of Psychopharmacology*, *28*, 1080-1087. doi:10.1177/0269881114550352

Kloep, M., Güney, N., Çok, F., & Simsek, Ö. F. (2009). Motives for risk-taking in adolescence: A cross-cultural study. *Journal of Adolescence*, *32*, 135-151. doi:10.1016/j.adolescence.2007.10.010

Mayeux, L., & Cillessen, A. H. N. (2008). It's not just being popular, it's knowing it, too: The role of self-perceptions of status in the associations between peer status and aggression. *Social Development*, *17*, 871-888. doi:10.1111/j.1467-9507.2008.00474.x

Mitchell, M. R., Weiss, V. G., Beas, B. S., Morgan, D., Bizon, J. L., & Setlow, B. (2014). Adolescent risk taking, cocaine self-administration, and striatal dopamine signaling. *Neuropsychopharmacology*, *39*, 955-962. doi:10.1038/npp.2013.295

Muehlenkamp, J. J., Peat, C. M., Claes, L., & Smits, D. (2012). Self-injury and disordered eating: Expressing emotion dysregulation through the body. *Suicide and Life-Threatening Behavior*, *42*, 416-425. doi:10.1111/j.1943-278X.2012.00100.x

Putarek, V., & Keresteš, G. (2016). Self-perceived popularity in early adolescence: Accuracy, associations with loneliness, and gender differences. *Journal of Social and Personal Relationships*, *33*, 257-274. doi:10.1177/0265407515574465

Simons, J. S., & Arens, A. M. (2007). Moderating effects of sensitivity to punishment and sensitivity to reward on associations between marijuana effect expectancies and use. *Psychology of Addictive Behaviors*, *21*, 409-414. doi:10.1037/0893-164X.21.3.409

Sipsma, H. L., Ickovics, J. R., Lin, H., & Kershaw, T. S. (2013). The impact of future expectations on adolescent sexual risk behavior. *Journal of Youth and Adolescence*, *44*, 170-183. doi:10.1007/s10964-013-0082-7

Slovic, P. (2000). What does it mean to know a cumulative risk ? Adolescents' perceptions of short-term and long-term consequences of smoking. *Journal of Behavioral Decision Making*, *13*, 259-266.

Virgili, M., & Severson, H. H. (1991). Adolescents' smoking behavior and risk perceptions. *Journal of Substance Abuse*, *3*, 315-324. doi:10.1016/S0899-3289(10)80015-X

Weber, E. U., Blais, A. E., & Betz, N. E. (2002). A Domain-Specific Risk-Attitude Scale: Measuring risk perceptions and risk behaviors. *Journal of Behavioral Decision Making. Dec. Making*, *15*, 263-290. doi:10.1002/bdm.414

Wilson, T. D., & Dunn, E. W. (2004). Self-knowledge: Its limits, value, and potential for improvement. *Annual Review of Psychology*, *55*, 493-518. doi:10.1146/annurev.psych.55.090902.141954

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