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# Subjective Invulnerability, Risk Behavior, and Adjustment in Early Adolescence

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## Abstract

The current study investigated whether invulnerability manifests with adaptive and maladaptive outcomes during early adolescence. We sampled 248 (53% female; 63% Caucasian;  $[\bar{X}]_{\text{age}} = 13.2$  years) early adolescents on the Adolescent Invulnerability Scale (AIS), and measures of drug use, delinquency, depressive symptoms, and mastery and coping. The AIS demonstrated a two-factor structure, which captured whether adolescents felt invulnerable to danger or psychological risks. Danger Invulnerability positively predicted delinquency and drug use. Conversely, Psychological Invulnerability negatively predicted depressive symptoms but positively predicted mastery and coping. These results suggest that felt invulnerability leads to both benefits and risks for early adolescents. Implications and future research directions are discussed.

## Keywords

adolescent invulnerability, adolescence, risk behavior, depressive symptoms

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Adolescents are widely thought to engage in risky behaviors because of a felt sense of subjective invulnerability. This belief is so entrenched in our folk psychology that the term *adolescence* often connotes reckless abandon and a cavalier disregard for danger. Consider, for example, the following opinion recently given regarding the source of an economic downturn:

The bigger lesson is that we do, indeed, need to grow up. Collectively we have been behaving like adolescents—believing we’re invulnerable, living for today while ignoring tomorrow, and sneering at anything that smacks of prudence. But grownups do take life seriously, and they pay attention to their fears. (Homer-Dixon, 2009).

This view underscores a widespread assumption that invulnerability is both a common and lamentable feature of adolescence. However, the empirical literature actually is quite equivocal with regard to both claims. First, while some researchers do posit a role for invulnerability during adolescence (e.g., Elkind, 1967; Lapsley, 2003; Lapsley, Fitzgerald, Rice, & Jackson, 1989), others have claimed that invulnerability is a self-serving bias endemic to decision making, and not just in adolescence (e.g., Beyth-Marom, Austin, Fischhoff, Palmgren, & Quadrel, 1993; Millstein & Halpern-Felsher, 2002; Quadrel, Fischhoff, & Davis, 1993). Second, counter to the commonly held view, recent research has suggested that a sense of invulnerability may confer benefits to adolescents, in addition to predisposing them to risky behaviors (e.g., Aalsma, Lapsley, & Flannery, 2006; Lapsley, 2003; Lapsley & Hill, 2010). Yet most of the extant studies have been done with late adolescents and emerging adults, and thus little is known about how invulnerability plays out with respect to risks and benefits in early adolescents. The present study examines the understudied topic of invulnerability, specifically whether it manifests in early adolescence with both benefits and consequences.

## Perspectives on Invulnerability

Two theories claim that invulnerability is a normative feature of adolescence. One theory argues that adolescents come to feel a sense of “indestructibility” as a concomitant of egocentrism that is thought to surge in early adolescence (Elkind, 1967, 1985). In Elkind’s view, adolescent egocentrism disposes adolescents to construct a fable of immortality that predisposes them to think that harmful outcomes are more likely for others than for themselves. Elkind viewed these personal fables of indestructibility as a lamentable feature of adolescence

insofar as it comprises adolescents' decision making. Elkind's (1967) theory of adolescent egocentrism has been one of the more influential theories of adolescent development over the last four decades. However, there are doubts about the theory on both theoretical (Lapsley, 1993; Lapsley & Murphy, 1985) and empirical grounds (Lapsley, Milstead, Quintana, Flannery, & Buss, 1986; Riley, Adams, & Nielsen, 1984). This criticism is based not so much on whether invulnerability is a normative feature of adolescence, or if it is linked to risk behavior, but rather falls with respect to whether cognitive egocentrism is the best theoretical framework in which to understand invulnerability.

An alternative theoretical framework argues that invulnerability is a byproduct of the separation-individuation process, and thus invulnerability is not so much a problem of cognitive development but of ego development (Blos, 1962; Josselson, 1988; Lapsley & Stey, IN PRESS). According to Blos (1962) a surge of narcissistic self-inflation and "self-induced ego states of a poignant internal perception of the self" (p. 98) emerge as a defense against the self-image vulnerabilities that attend the individuation process, giving the adolescent a strong sense of indestructibility and personal agency. Indeed, for Blos (1962), invulnerability "gives the individual a false sense of power which in turn impairs his judgment in critical situations, often with catastrophic consequences" (p. 100).

Hence, for both Elkind and Blos, invulnerability is a normative feature of adolescent development. It is an outcome of adolescents' developmental status, although different developmental mechanisms are implicated. For Elkind, invulnerability is a personal fable that results from cognitive egocentrism. For Blos, invulnerability is a narcissistic defense against mourning reactions. Yet both theorists view invulnerability as a risk factor. Both see it as something that exposes adolescents to greater hazards insofar as it impairs decision making in critical situations

Yet subjective invulnerability may not function solely as a risk factor in adolescence. Although the adaptive possibilities of invulnerability are foreign to the folk theory of adolescence, it is implicit nonetheless in Blos' account of separation-individuation. Moreover, there are empirical reasons for thinking that invulnerability may be associated with positive outcomes. For example, Aalsma et al. (2006) showed that felt invulnerability (measured as a "personal fable") was positively associated with both narcissism and self-worth, but also delinquent risk behavior, suggesting that invulnerability may present with two faces. That is, invulnerability may indeed predict risk behavior, as the folk theory asserts, but it also is associated with certain adaptive outcomes as well.

Research on subjective invulnerability has been hampered by a lack of suitable assessments. Such an assessment should consider invulnerability as more than risk appraisal, and in turn should (a) predict increased risk behavior, (b) account for the possible benefits that result from a sense of invulnerability. Lapsley and Hill (2010) have developed a promising measure of subjective invulnerability, known as the Adolescent Invulnerability Scale (AIS). The AIS is comprised of two subscales: Danger Invulnerability and Psychological Invulnerability. Danger Invulnerability refers to the individual's sense of personal indestructibility in the face of physical risks. Psychological Invulnerability measures the extent to which an individual feels undaunted by psychological or personal distress. Danger Invulnerability thus can be considered the more "traditional" maladaptive face of invulnerability, whereas Psychological Invulnerability measures its more adaptive nature (Lapsley, 2003). In their sample of emerging adults, Lapsley and Hill (2010) found initial support for the construct validity of the AIS. Danger Invulnerability predicted greater delinquency and drug use, as well as indices of depressive, interpersonal, and self-esteem issues. Psychological Invulnerability though strongly counterindicated all three measures of psychological problems, and thus appeared to be beneficial to the emerging adults sampled. These effects ranged from small to large in magnitude ( $\beta$ 's ranged between .19 and .38). Moreover, these measures of subjective invulnerability were a more robust predictor of all outcomes than were measures of optimism bias.

The purpose of the present study is to explore Danger and Psychological Invulnerability in a sample of early adolescents. Although previous research is promising with respect to the construct validity of the AIS, it has yet to be demonstrated with an early adolescent sample. This is an important empirical deficit, because early adolescence is a period during which, presumably, the surge of invulnerability should be increasing given the claims of developmental theory.

## **Current Study**

The current study addressed two goals. First, we examined the factor structure of the AIS using an early adolescent sample. Given that this scale demonstrated two subscales with emerging adults (Lapsley & Hill, 2010), we evaluated whether this two-factor structure held with early adolescents. Second, we evaluated whether invulnerability is associated with both risks and positive adjustment during this developmental period. We predicted that a sense of Danger Invulnerability would prove maladaptive to adolescents, while Psychological Invulnerability would be associated with adaptive outcomes.

## Method

### Participants

We sampled 248 (53% female; 63% White;  $[\bar{X}]_{\text{age}} = 13.2$  years) early adolescents from a Midwestern suburban middle school. The sample was comprised 55% of seventh-grade students (54% female) and 45% of eighth-grade students (52% female). Sixty-three percent of the adolescents were White, 16% were African American, 3% were Latino/Hispanic, 1% were Asian, 4% were Native American, 8% were Multiracial, and 5% were represented by other ethnic groups. Family structure was determined by the number of parents currently residing in the participants home. Forty-seven percent lived with their natural or adoptive mother and father, 23% lived with mostly their mother, 16% lived with their mother and step-father, and the remaining respondents reported that they live with mostly their father, their father and step-mother, foster parents, grandparents, or another relative. The participants also responded to an item regarding their mother and father's education. Within this sample, at least 87% of the mothers and 85% of the father's graduated from high school.

### Procedure

Prior to participation, adolescents had to provide both personal assent and parental consent. Participants completed survey packets within a group setting, typically within intact classes. Packets were constructed with questionnaires randomly sorted to avoid order effects. The questionnaires of interest are discussed below. In addition to these measures, participants completed a separate measure of personal fable ideation, and a grandiose narcissism scale.

*AIS.* The AIS (Lapsley & Hill, 2010) assesses participants' felt vulnerability to physical danger (Danger Invulnerability) and to social and psychological risks (Psychological Invulnerability). The scale consists of 20 items that are responded to on a 5-point Likert-type scale with the following labels: 1 (*strongly disagree*), 2 (*disagree*), 3 (*neutral*), 4 (*agree*), and 5 (*strongly agree*). Sample items from the Danger subscale include "I'm unlikely to get injured in an accident," "Nothing bad will happen to me when I go to a place by myself," and "There are times when I think I am indestructible." Sample items from the Psychological subscale include "Nothing seems to bother me," "My feelings don't get hurt," and "The opinions of other people just don't bother me." Both subscales demonstrated strong reliability: Danger (12 items;  $\alpha = .81$ ) and Psychological (8 items;  $\alpha = .78$ ). It is worth noting that while a few items from the Danger subscale does ask about specific risk-taking behaviors, these items are phrased to ask participants whether such risks would be dangerous

to them *assuming the participant had taken the risk*. Therefore, the scale does not ask participants about their actual risk-taking behavior.

**Delinquency.** Delinquency was assessed using a self-report battery developed by Rowe (1985). Participants rate the extent to which they engaged in 20 different activities on a 4-point Likert-type scale from 1 (*no/never*) to 4 (*very often*). Sample items include “Did you ever go onto someone’s property when they did not want anyone there?”, “Did you ever take something from a store without paying for it?”, and “Did you ever take part in a fight in which a group of your friends was against another group?” In spite of the heterogeneity of content, the various items can be considered a single factor (Rowe & Flannery, 1994). Reliability in the current sample was strong ( $\alpha = .93$ ). A factor analysis with the current sample also suggested a single factor, which accounted for 45% of variance (eigenvalue = 8.90).

**Drug use.** Participants were asked to indicate the lifetime usage and frequency of use of seven different drugs (alcohol, tobacco, inhalants, marijuana, hallucinogens, cocaine/crack, and amphetamines). Lifetime usage was indicated on a 5-point scale from 1 (*never*) to 5 (*40 or more times*). Frequency was indicated on a 5-point Likert-type scale from 1 (*never*) to 5 (*daily*). Both scales demonstrated strong reliability: lifetime usage ( $\alpha = .78$ ) and frequency ( $\alpha = .78$ ).

**Depressive symptoms.** Participants completed the 30-item Reynolds Adolescent Depression Scale (RADS, Reynolds, 1987) to assess depressive symptoms. Participants indicate on a 4-point Likert-type scale how frequently the item occurs to them from 1 (*almost never*) to 4 (*most of the time*). A sample item is “I feel sorry for myself.” Reliability was strong in the current sample ( $\alpha = .92$ ).

**Positive adjustment.** Participants completed the superior adjustment and mastery and coping subscales of the Self-Image Questionnaire for Young Adolescents (SIQYA; Peterson, Schulenberg, Abramowitz, Offer, & Jarcho, 1984). Both subscales consist of 10 items that are evaluated on a 6-point Likert-type scale from 1 (*describes me very well*) to 6 (*does not describe me at all*), which are reverse-scored in order for higher scores to indicate greater adjustment. A sample item from the superior adjustment subscale is “I am a leader in school.” A sample item from the mastery and coping subscale is “If I put my mind to it, I can learn almost anything.” Both subscales demonstrated strong reliability (superior adjustment:  $\alpha = .70$ ; mastery and coping:  $\alpha = .71$ ).

## Results

### Confirmatory Factor Analysis

We first examined whether the AIS would exhibit a two-factor solution as found with emerging adults (Lapsley & Hill, 2010). Using AMOS, we tested a

confirmatory factor model with 12 indicators for the Danger Invulnerability factor and 8 indicators for the Psychological Invulnerability factor. The two factors were allowed to intercorrelate. A strong model would be indicated by a  $\chi^2/df$  ratio of less than 3, a CFI greater than or equal to .95, and an RMSEA less than or equal to .08 (e.g., Hu & Bentler, 1999). Our initial model fit was moderate,  $\chi^2(169) = 415.4$  (Ratio = 2.46),  $p < .001$ ; CFI = .80; RMSEA < .08. The less-than-ideal fit was likely due to having 20 separate item indicators in the model. Accordingly, we created two-item parcels (thus, 6 indicators for Danger Invulnerability and 4 for Psychological Invulnerability) and retested the model. Compared to single items, parcels tend to be more reliable and are more normally distributed (Little, Cunningham, Shahar, & Widaman, 2002). The resulting model fit well,  $\chi^2(34) = 81.94$  (Ratio = 2.41),  $p < .001$ ; CFI = .94; RMSEA < .08. Therefore, it appears as though the two-factor solution does hold with early adolescents, providing further support both for the AIS as a measurement tool and for a “two faces” conception of adolescent invulnerability (Lapsley, 2003).

### *Tests of Sex and Grade Differences*

We then adjusted the model to consider age and sex differences. Males scored higher on both invulnerability scales: Danger,  $\beta = .38$ ,  $t = 5.16$ ,  $p < .001$ ; Psychological  $\beta = .51$ ,  $t = 6.95$ ,  $p < .001$ . There were no differences between seventh and eighth graders, both  $t$ 's < 1.

### *Descriptive Statistics and Correlations*

Prior to the analyses of primary interest, we first examined the relationships between all variables in the current study. Table 1 provides the descriptive statistics and correlations between all variables of interest, controlling for sex. We controlled for sex given the likely differences in the outcomes of interest. Two points regarding these correlations are of particular note. First, the two AIS subscales were significantly correlated, but the magnitude of this relationship suggests that they are not synonymous constructs. Second, these correlations suggest some initial support for the view that invulnerability manifests with two faces. Danger Invulnerability positively correlated with risk behavior, whereas Psychological Invulnerability was positively related with adjustment outcomes but negatively with depressive symptoms.

Given the sex differences in mean levels of invulnerability, we examined whether sex differences also were evident in the relations between the invulnerability subscales and the outcome measures. To test this claim, we tested whether the correlations evidenced for males differed from those for females, using Fisher  $r$ -to- $z$  transformation tests. None of the 12 sex comparisons reached significance,

**Table 1.** Correlations Between Variables of Interest, Partialling for Sex

|                    | DI    | PI     | Delin  | LDU    | DUF    | Dep     | SA      | M&C     |
|--------------------|-------|--------|--------|--------|--------|---------|---------|---------|
| DI                 | —     | .37*** | .27*** | .21*** | .23*** | .04     | .00     | .13**   |
| PI                 |       | —      | .07    | .01    | .02    | -.24*** | .12*    | .30***  |
| Delin              |       |        | —      | .68*** | .65*** | .28***  | -.31*** | -.25*** |
| LDU                |       |        |        | —      | .92*** | .24***  | -.21*** | -.18*** |
| DUF                |       |        |        |        | —      | .17**   | -.20*** | -.18*** |
| Dep                |       |        |        |        |        | —       | -.39*** | -.39*** |
| SA                 |       |        |        |        |        |         | —       | .54***  |
| M&C                |       |        |        |        |        |         |         | —       |
| Mean               | 27.39 | 21.81  | 31.13  | 10.30  | 9.54   | 62.01   | 44.87   | 45.49   |
| Standard deviation | 8.36  | 6.38   | 11.50  | 4.25   | 3.83   | 15.97   | 8.02    | 7.92    |

Note: DI = Danger invulnerability, PI = Psychological invulnerability, Delin = Delinquency, LDU = Lifetime drug use, DUF = Drug use frequency, Dep = Depressive symptoms, SA = Superior adjustment, M&C = Mastery and coping.

\* $p < .1$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

all  $p$ 's  $> .05$ , suggesting that sex did not moderate any of the relations reported between two invulnerability subscales and the outcomes. In addition, several of our outcomes were highly correlated. Thus, we tested our primary hypotheses using structural equation modeling, testing two models: one predicting a risk-taking latent outcome, and one predicting a psychological well-being latent outcome.

### Risk-Taking Outcomes

For tests of the relation between invulnerability and risk taking, a latent outcome construct was created with delinquency, lifetime drug use, and drug use frequency as indicators. We controlled for gender differences in the outcome. The resulting model fit reasonably well,  $\chi^2(72) = 194.34$  (Ratio = 2.70),  $p < .001$ ; CFI = .92; RMSEA = .08. All three risk-taking indicators evidenced strong loadings on the overall latent constructs (mean standardized absolute loading value = .87). Following predictions, Danger Invulnerability predicted greater risk taking,  $\beta = .37$ ,  $t = 3.74$ ,  $p < .001$ . However, Psychological Invulnerability did not,  $\beta = -.18$ ,  $t = -1.81$ ,  $p > .05$ . Thus Danger Invulnerability clearly appears to capture the negative, risk-promoting aspect of adolescent invulnerability.

### Psychological Outcomes

We then examined whether invulnerability may also benefit the adolescent, by predicting a psychological well-being construct with three indicators: superior

adjustment, mastery and coping, and depressive symptoms (a negative indicator). Again we controlled for gender differences in the outcome. The resulting model fit reasonably well,  $\chi^2(72) = 160.27$  (Ratio = 2.23),  $p < .001$ ; CFI = .92; RMSEA = .07. All three psychological well-being indicators evidenced strong loadings on the overall latent constructs (mean standardized absolute loading value = .66). In contrast to the risk-taking outcome, the opposite pattern of results was evidence. Psychological Invulnerability positively predicted well-being,  $\beta = .49$ ,  $t = 4.00$ ,  $p < .001$ ; but Danger Invulnerability was unrelated,  $\beta = -.12$ ,  $t = -1.19$ ,  $p > .05$ . Therefore, Psychological Invulnerability appears to benefit the adolescent, unlike Danger Invulnerability.

## General Discussion

Folk psychology portrays adolescents as incorrigible individuals who engage in risk behavior without regard for the consequences of their actions. Implicit in this view are claims that invulnerability is both pervasive and lamentable in adolescence. However, research on adolescent invulnerability has been equivocal on both claims. The current study addressed this topic by examining whether invulnerability is an informative construct for describing early adolescence, and if so, whether it leads to both adaptive and maladaptive outcomes during this developmental period.

The current study first sought to examine the factor structure of a promising new measure, the AIS (Lapsley & Hill, 2010), with an early adolescent sample. This measure was initially validated with a sample of emerging adults, and thus the current study served as the first examination of this scale with adolescent participants. A confirmatory factor analysis supported the two-factor structure previously evidenced with emerging adults. Indeed, the AIS consists of two subscales, Danger and Psychological Invulnerability, both of which demonstrated high reliability in the current study. Given evidence of its factor structure and reliability, we then proceeded to test the construct validity of the AIS with an early adolescent sample.

The two AIS subscales indeed appeared to capture both the AIS negative “risk-promoting” and positive “self-promoting” facets of adolescent invulnerability. Danger Invulnerability demonstrated a largely maladaptive profile. It positively related to three measures of risk behavior: delinquency, lifetime drug use, and drug use frequency. However, it was not predictive of the psychological well-being construct. Indeed, these results mirror those found with an emerging adult sample (Lapsley & Hill, 2010).

Psychological Invulnerability though led to a more adaptive psychological profile. It was positively related to both superior adjustment and mastery and coping. It also counterindicated depressive symptoms. This later finding also

replicates Lapsley and Hill (2010), who found a similar negative relationship. These results support claims that a sense of invulnerability may in fact benefit adolescents, because it promotes positive coping and adjustment during the travail of ego and identity formation. Therefore, the current study found broad support for the usefulness of the AIS, and that it clearly captures both the negative and positive aspects of adolescent invulnerability (Lapsley, 2003). It is worth noting that, as evident from the means in Table 1, that invulnerability is not “universal” in adolescence. Instead, counter to some lay perceptions, most adolescents did not view themselves as invulnerable, in part discounting beliefs that adolescents as a whole are reckless.

The current study adds to the accruing evidence that adolescent invulnerability cuts two ways, a notion that leads to some possibly counterintuitive suggestions regarding intervention programs. Counter to folk wisdom, our results suggest that interventions should avoid simply deterring adolescents from feeling invulnerable. Indeed, some sense of personal invulnerability is adaptive during adolescent development. Adolescents may even benefit from programs that imbue a sense of Psychological Invulnerability, and/or mirror such cognitions back to the adolescent. Programs should encourage adolescents to build a strong sense of self-worth internally, and to be less emotionally susceptible to the opinions of their peers.

Given that the current study only sampled seventh and eighth graders, it was not designed to consider developmental trajectories in felt invulnerability. However, if invulnerability indeed is particularly endemic to adolescence (Elkind, 1967; Lapsley, 2003; Lapsley & Murphy, 1985), one would expect adolescents to report greater felt invulnerability than adults. Future research thus should examine invulnerability as a *developmental* phenomenon. Longitudinal examinations would provide better insight into how a sense of invulnerability ebbs and flows during the lifespan. Furthermore, such work could evaluate Lapsley and Hill’s (2009) claim that a sense of invulnerability may in fact be adaptive whenever one encounters a turbulent life transition.

Future research also should investigate the developmental relationships between invulnerability and the separation-individuation process. Some work indeed has demonstrated correlational links between these two constructs (Lapsley et al., 1989; Vartanian, 1997); for example, a greater sense of invulnerability is linked to less separation anxiety. However, these studies were cross-sectional in nature, and thus fail to systematically assess whether the separation-individuation process breeds a sense of invulnerability among adolescents. Research thus is needed to properly investigate how these processes are related during adolescent development.

There are some limitations to our study worth noting. Having a somewhat homogenous sample prevented analyses of differences by ethnicity or socioeconomic status. One may predict that adolescents living in a more stable environment may perceive greater subjective invulnerability. Adolescents may report greater vulnerability if they are confronted regularly with images of and experience with human mortality. Future research should then examine whether invulnerability is an informative construct when predicting risk engagement by adolescents living in these negative environments. Our study also relied on self-report measures of delinquency and drug use, which may be subject to socially desirable responding. Our results do suggest though that adolescents felt free to respond accurately to these measures, as some adolescents reported scores that were near the maximum possible. However, our results should be supplemented with studies using more “online” measures of risk taking. For example, it would be of interest to test whether Danger Invulnerability predicts adolescents’ performance on gambling tasks relevant for early adolescents, such as the cake gambling task (Van Leijenhorst, Westenberg, & Crone, 2008) and the Balloon Assessment of Risk Taking (Lejuez, Aklin, Zvolensky, & Pedulla, 2003). In addition, future work should compare whether invulnerability demonstrates unique prediction of outcomes when included in regression models along with measures of different subtypes of narcissism, as suggested by the results of previous work (Aalsma et al., 2006).

In summation, invulnerability during early adolescence exhibits two faces. Danger Invulnerability is largely maladaptive and leads to risk taking, whereas Psychological Invulnerability is largely adaptive and leads to psychological well-being. These results provide further evidence that felt invulnerability is a descriptive construct for studying adolescence, and should not be considered a wholly lamentable aspect of adolescent development.

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