

POSITIVE RISK TAKING SCALE

Developed by Natasha Duell, Ph.D. and Laurence Steinberg, Ph.D.

The following information is for the self-reported positive risk taking scale developed by Natasha Duell and Laurence Steinberg for Natasha's dissertation study (Title: *Positive Risk Taking in Adolescence*, defended and passed in May 2018).

The scale was tested in a preliminary sample of 164 American adolescents ages 16-20. Data collection is still ongoing. Upon completion of data collection, final analyses will be conducted and results will be submitted for publication.

Researchers may feel free to use the scale in-part or in-full at their own discretion.

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Below are items for the positive risk taking scale. This questionnaire was formatted to match the Bentin risk perception scale. The end of this document also contains an informal summary of the psychometric properties of the positive risk taking scale.

Task Name: *Activities I Have Done.*

Here is a list of different things you may have done at some time in the past. For each one, please indicate whether you have ever done it, and, if so, how many times you have done it in the past six months.

Have you ever...

...How many times have you engaged in this activity *during the last six months?*

1. Tried out for a team or auditioned for a play when you were not sure you would be picked?
2. Joined a new club or activity when you were not sure you would like it?
3. Told someone the truth, even if they did not want to hear it?
4. Tried a new food you thought you might not like?
5. Ran for a leadership role in school or in some other organization when you were not sure you would be picked?
6. Asked someone new on a date when you thought the person may say no?
7. Taken a class in a subject you knew nothing about or that seemed challenging?
8. Tried a new hairstyle or outfit that you were not sure others would like?
9. Gone to a party or social event where you did not know very many people and thought you might not have anyone to talk with?
10. Told a secret or shared something personal about yourself to someone?
11. Stood up for what you believe is right, even though you thought someone might disagree with you?
12. Started a friendship with someone new when you were not sure how your other friends would react?
13. Tried a new sport or played a sport you are not good at where you might have embarrassed yourself?
14. Spent time with a new group of people when you were not sure you would fit in?

Response options:

Have you ever...

(0) No (1) Yes

How many times have you engaged in this activity *during the last six months?*

(0) None (1) Once or twice (2) 3-5 times (3) More than 5 times

(Additional questions below)

Additional questions (time-permitting)

Risk Perception

If you did this activity, how RISKY is it that something bad would happen to you?

- (0) Not at all risky for me
- (1) A little bit risky for me
- (2) Pretty risky for me
- (3) Very risky for me

Risk Preference

How would you compare the good (or pleasures) of this activity with the bad?

- (1) Much more good than bad
- (2) Some more good than bad
- (3) Some more bad than good
- (4) Much more bad than good

SUMMARY OF POSITIVE RISK TAKING SCALE PSYCHOMETRIC PROPERTIES

TEST SAMPLE: The sample for the dissertation study included 164 adolescents from the U.S. who have been participating in a larger cross-national study of parenting across cultures, *Parent Behavior and Child Adjustment Across Cultures* (PAC; Lansford & Bornstein, 2011). Participants from the U.S. sample included an ethnically diverse group (32% African American, 37% European American, and 31% Hispanic) of males and females (45% Female) ages 16-20 ($M = 17.9$; $SD = .72$). Participants came from households that were primarily working and middle class, based on the average of caregivers' education (median education level for the sample is, "some college"). ***At the time this study was conducted, the full U.S. sample had not been collected. The full sample includes ~237 youth. It is currently unknown how the participants in this sample differ from those who are still being interviewed.***

POSITIVE RISK TAKING SCALE DESCRIPTION. Positive risk taking was measured using 14 items modified from previous studies (Fischer & Smith, 2004; Monahan et al., *unpublished*). This scale was included in the PAC/DEL battery for the first time in the ninth wave of data collection. Items referred to risks thought to (a) be socially acceptable and (b) hold the potential to benefit the well-being of the individual or others around them. Based on the definition of risk outlined in Duell and Steinberg (in press) (i.e., engaging in a behavior for which the outcomes are uncertain), the wording of several of the risk items was modified from the original scales to emphasize the novelty and ambiguity of each scenario. For example, the statement, "Initiated a friendship," was revised to read, "Started a friendship with someone new when you were not sure how your other friends would react." Participants were asked to indicate whether they had ever engaged in the activity (*Yes, No*) and how many times they had engaged in the activity over the past six months (*None, Once or Twice, 3-5 Times, More than 5 Times*). Response options were coded to match the Benthin scale of risk perception to facilitate comparison between positive and negative risk taking scales. The 14 positive risk items were examined in an exploratory factor analysis. Ultimately, a single-factor, 10-item scale evinced the best model fit (see Table 2 for factor loadings and model fit statistics) and reliability ($\alpha = .746$). The four items removed from the scale for the study were items 1, 3, 5, and 6. **(Researchers are encouraged to administer all 14 items so that the full scale may be tested in multiple samples before items are permanently eliminated from the scale.)**

Frequency responses for engagement within the past six months were recoded into dichotomous variables indicating whether participants had engaged in the activity at least once over the past six months (coded 1) or had not engaged in the activity over the past six months (coded 0). Participants who had never engaged in the activity were also given a 0 score. Positive risk taking was computed as a proportion of positive risks endorsed out of all possible risks. So-called "variety scores" have been widely used in criminological research because they are highly correlated with frequency measures but less susceptible to participant recall bias and unreliable estimates, a problem in the case of activities that some individuals engage in frequently. Furthermore, frequency scores for positive risks may be particularly unreliable given restrictions on opportunities to engage in certain risks (e.g., enrolling in an advanced course). In the present sample, the frequency and variety scores for the 10-item positive risk taking scale were highly correlated ($r = .932, p < .001$).

Table 1. Model Fit Statistics and Factor Loadings from Factor Analyses for Positive Risk Taking Scale

Positive Risk Taking Model Fit Statistics	
Fit Index	Coefficient and Significance
$\chi^2(35)$	33.809, <i>ns</i>
RMSEA	< .001, 90% CI = 0 - .056, <i>ns</i>
CFI	1
SRMR	.086
Factor Loadings from EFA	
Item	Loading
Joined new club/ activity	.485*
Tried new food	.447*
Enrolled in challenging class	.586*
Tried new outfit or hairstyle	.588*
Gone to event w/new people	.651*
Shared something personal	.782*
Stood up for beliefs	.685*
Started new friendship	.685*
Tried new sport	.472*
Hung out w/new peer group	.852*

Note. Results are from the final, single-factor solution from the exploratory factor analyses. Four items were omitted from the final positive risk scale: *tried out for team/auditioned for play, told someone the truth, ran for a leadership role, and asked someone on a date.* **Since these results are only preliminary, researchers are encouraged to administer the full, 14-item scale, if possible.** See Kline (2011; pp.193-209) for a discussion of model fit.

* $p < .05$

Finalization of the Positive Risk Taking Scale

An exploratory factor analysis was conducted on the 14 positive risk items, modeling for up to 4 factors and using oblique rotation. Model fit statistics and factor loadings for individual items yielded 4 consistently problematic items: (1) tried out for a new team or auditioned for a play; (2) told someone the truth; (3) run for a leadership role; (4) asked someone new on a date for the first time. These items either consistently loaded poorly on all factors, or loaded equally on more than one factor. After removing these four items, a single factor, 10-item scale was developed with excellent model fit (Table 1) and reliability ($\alpha = .746$).

Measurement invariance. To ensure that the positive risk taking scale was consistent across gender, ethnicity, and age, three tests of measurement invariance using the alignment method (Asparouhov & Muthén, 2014) were conducted to confirm measurement invariance of the positive risk taking items across groups. The alignment method estimates factor mean and variance parameters in each group by incorporating a simplicity function similar to that of the rotation criteria used with exploratory factor analysis. An iterative procedure determines the largest “set” of groups containing no significant difference on a given parameter. Pairwise tests establish the largest set of groups that do not significantly differ ($\alpha = .01$ to adjust for multiple comparisons). Any two groups that do not differ are connected. Next, the average value of the parameter from this invariant group is compared to the value of the parameter of each individual group. If the comparison suggests not-significant differences, the group is added (or kept in) to the invariant set; if there is a significant difference, the group is removed (or kept out of) the invariant set. This procedure is repeated until no groups are added or removed for each parameter. Groups excluded from the invariant set, therefore, differ from the average value of the invariant group for a given parameter. In the output file, Mplus flags the scale items for which there is group measurement non-invariance. Results indicated measurement invariance across males and females, individuals identifying as being White, Black, or Hispanic, and across age (using the groups defined above).

Discriminant validity. To ensure that the positive and negative risk taking scales represented two distinct constructs (rather than a single “risk taking” factor), two confirmatory factor analyses were conducted to determine the extent to which the (10-item) positive and (15-item) negative risk taking [not included in this document] scales were distinguishable. In the first CFA, a single factor model was examined using all of the positive and negative risk items. In the second CFA, a 2-factor model was examined (one factor with the 10 positive risk items and a second factor with the 15 negative risk items). If the 2-factor CFA yielded the best model fit, this would be evidence in favor of the notion that the 10 positive risk items and 15 negative risk items represented two distinct constructs.

Weighted least squares (WLSVM) estimation was used for the factor analyses given the dichotomous nature of the risk variables. For WLSVM estimation, traditional chi-square testing is not possible because the chi-square difference is not distributed as a chi-square (Muthén & Muthén, 2012). Thus, according to convention, the DIFFTEST option in Mplus was used to compare chi-square model fit between the single-factor and two-factor risk models. Using this approach, the least-restrictive model (the two-factor model) was fit first. The derivatives from this model were saved and then used in the test of the most restrictive model (the single-factor model). A significant *p*-value for the difference test suggests that the restriction worsens model

fit. Results from the DIFFTEST analysis suggested that the single-factor model was a significantly worse fit to the data than the two-factor model ($\Delta\chi^2(1) = 39.93, p < .001$), supporting the notion that the positive and negative risk taking items represented two distinct constructs.

A Wald Test for discriminant validity was also conducted using the MODEL TEST command in Mplus. This analysis tested whether the correlation between the two continuous factors (positive and negative risk taking) was equal to 1. A significant Wald test (i.e., rejecting the null hypothesis that the correlation is equal to 1) would indicate discriminant validity between the factors. Results of this analysis yielded a significant Wald coefficient, indicating that the correlation between the factors was not equal to 1 and therefore providing evidence for discriminant validity between the positive and negative risk scales (Wald $\chi^2(1) = 279.43, p < .001$).