
A Validation Study of the Adolescent Risk-taking Questionnaire

Eleonora Gullone, Jacqueline Paul

Monash University

Susan M. Moore

Swinburne University of Technology

The Adolescent Risk-taking Questionnaire (ARQ) was developed to comprehensively assess adolescent risk-taking beliefs and behaviours. Research has shown that it is a reliable instrument with strong construct validity. The current study investigated the convergent and discriminant validity of the ARQ by comparing responses of a sample of 52 male adolescents from a juvenile justice centre and 211 school-attending male adolescents. Consistent with past research, the juvenile justice centre youth reported significantly higher levels of depression and less optimal levels of parent attachment compared to school-attending youth. Convergent validity of the ARQ was demonstrated through significant relationships between attachment and risk-taking. Specifically, those adolescents with less optimal parent attachment were more likely to engage in risk-taking behaviour and were less likely to perceive the behaviours included in the ARQ as risky compared to those with more optimal levels of parent attachment. Discriminant validity of the ARQ was demonstrated through significant differences between the two groups on risk beliefs and behaviours. Responses on the ARQ indicated that youth from the juvenile justice centre were significantly more likely to engage in risky behaviours, if given the opportunity, than school-based youth. They also perceived the behaviours to be less risky. It was concluded that the ARQ has good convergent and discriminant validity.

The adolescent developmental period has consistently been documented to be more strongly characterised by a propensity to engage in risk-taking behaviours than any other developmental period. Such behaviours have potentially dangerous or even fatal outcomes (e.g., Arnett, 1992; Flannery, Vazsonyi, & Rowe, 1996; Gonzalez et al., 1994; Gullone, Moore, Moss, & Boyd, 2000; Lavery, Siegel, Cousins, & Rubovits, 1993; Levitt, Selman, & Richmond, 1991). The propensity for risk-taking is stronger in adolescent boys compared to girls. Irwin (1993) reported that boys die at more than twice the rate of girls from primary causes that are behavioural in origin. Such

causes include violence, as well as intentional and unintentional injuries (Crunbaum & Basen-Engquist, 1993; Irwin, 1993).

In line with common views about what constitutes risk-taking behaviour, Moore and Gullone (1996) defined adolescent risk-taking as “behaviour which involves potential negative consequences (loss) but is balanced in some way by perceived positive consequences (gain)” (p. 347). If the positives far outweigh the negatives, the behaviour is rarely perceived to be risky whereas, when the negatives outweigh the positives, the behaviour is generally regarded to be extremely risky or even foolish. Thus, the level of perceived riskiness can predictably be

*Address for correspondence: Dr E. Gullone, Dept. of Psychology, Monash University, Clayton VIC 3168, Australia.
Email: E.Gullone@sci.monash.edu.au*

determined by the balance between these two types of consequences. A comprehensive definition of risk-taking must also take into consideration the probability of outcomes actually occurring, the strength of those outcomes, and their negativity or positivity. Thus, extremely risky behaviours are those for which the probability of occurrence of the negative consequences far outweighs the potential positive consequences, and the severity of such consequences is strong.

Much recent research on adolescent risk-taking behaviour has focused on factors underlying adolescents' decisions to participate in risky behaviour and characteristics that describe risk-taking adolescents. Factors investigated have included, for example, sensation-seeking, temperament, impulsivity (Moore & Rosenthal, 1993; Zuckerman, 1979), locus of control (Werner, 1986), and self-esteem (Garmezy, 1983). Protective factors against risk-taking include a high level of self-esteem and an orientation toward an internal locus of control. In contrast, adolescents characterised by high levels of sensation-seeking and impulsivity appear to be more vulnerable to engaging in risky behaviours.

Given that, in comparison to other life periods, the adolescent years are characterised by a heightened potential for recklessness, thrill-seeking, and risk-taking behaviours (Arnett, 1992), these behaviours have been proposed, to some extent, to be normative for this developmental period (Shedler & Block, 1990). However, in its extreme, risk-taking behaviour is predictive of delinquency and a diagnosis of conduct disorder (Lavery et al., 1993). Moreover, adolescents diagnosed with conduct disorder are at increased risk of depression (Capaldi & Stoolmiller, 1999; Dryfoos, 1993).

Adolescents diagnosed with conduct disorder have been reported to be more likely to perceive benefits from their risk participation activities compared to nondisordered peers. Also, for adolescents diagnosed with conduct disorder, no relationship has been found between risk judgements and risk behaviours. In contrast, for nondisordered adolescents, a significant negative relationship between involvement and perceived risk has been found.

Additional factors that have been reported to be predictive of adolescent risk or problem behaviours include family and peer relationship factors (Cernkovich & Giordano, 1987; Dryfoos, 1993; Irwin, 1993). In particular non-supportive parent-child relationships and a peer culture characterised by risk behaviours have been associated with adolescent problem behaviour (Levitt et al., 1991). Within the framework of social bonding theory, Hawkins and Weis (1985) have argued that it is those adolescents who are less invested in traditional values such as family and school who are more likely to associate with deviant peers. Along similar lines, Patterson, DeBaryshe, and Ramsey (1989) proposed that inept parenting predicted the development of aggressive and socially unskilled children who, as a consequence, are more likely to be rejected by non-delinquent peers. Indeed, peer attachment has been described as the single best predictor of problem behaviours such as adolescent delinquency and substance use (Pilgram, Luo, Urberg, & Fang, 1999; Poulin, Dishion, & Haas, 1999).

The above review indicates that a substantial amount of research has been conducted in the areas of adolescent risk-taking and problem behaviour. However, in recent work, Gullone et al. (2000) have highlighted several limitations relating to much of this research. The most predominant limitation relates to the validity and comprehensibility of the assessment of adolescent perceptions of risk and corresponding behaviours. Such assessment has, in part, been stifled by varying conceptualisations of risk-taking behaviour and by a selective and limited research focus primarily based on researcher-defined risks (Moore & Gullone, 1996). For example, in addition to the narrow focus (i.e., only reckless risk behaviours) of Arnett's (1992) questionnaire, its items are researcher-nominated. Although Alexander et al. (1990) based the content of their six-item questionnaire on adolescent reports of risk-taking, their sample was limited to rural and younger adolescents (those who are less likely to engage in high levels of risk-taking behaviour). Lavery and colleagues' (1993) instrument, although

much broader, has not been demonstrated to be psychometrically sound.

The Adolescent Risk-taking Questionnaire (ARQ; Gullone et al., 2000) was developed to address these limitations. The items of the ARQ are based on the conceptualisation of risk-taking held by a broadly based sample of adolescents (i.e., 570 school-based adolescents aged between 12 and 17 years). The questionnaire assesses self-reported levels of risk engagement as well as adolescent judgements of the riskiness relating to 22 different behaviours. In particular, four categories of risk are assessed with the ARQ. The four categories include thrill-seeking behaviours (e.g., parachuting, rollerblading), rebellious behaviours (e.g., getting drunk, staying out late), reckless behaviours (e.g., drinking and driving, having unprotected sex), and antisocial behaviours (e.g., cheating, teasing, and picking on people).

Research using the ARQ with school-based adolescents has found that risk judgements tend to be moderately and negatively correlated with risk behaviours. Also, with the exception of thrill-seeking, younger adolescents indicate stronger risk judgements compared to older adolescents. Consistent with their judgements, older adolescents not only generally perceive the behaviours to be less risky, they also report participating in them more frequently than younger adolescents. With regard to sex differences, female adolescents have been found to score lower than male adolescents on reckless, thrill-seeking, and antisocial behaviours, but higher on risk judgements of reckless behaviours (Gullone & Moore, 2000; Gullone et al., 2000).

Gullone and colleagues' (2000) study indicated good reliability and suggested adequate validity for the ARQ. The present study aims to further investigate the psychometric properties of the ARQ. In particular, we investigate the convergent validity of the ARQ through determination of the relationships between adolescent reports on the ARQ and self-reported adult and peer attachment. On the basis of past research, it is expected that both peer and parent attachment will be significantly associated with risk-taking behaviours and judgments for a

delinquent group of adolescents. For a school-based group of adolescents, it is expected that risk-taking behaviours and judgements will be significantly associated only with parent attachment. Males are the focus of the study because they are consistently over-represented in rates of risk-taking, particularly delinquency, compared with females (e.g., Australian Bureau of Statistics, 1997; Stern, Northman, & Van Slyck, 1984; Trimpop, 1994). We also investigate the discriminant validity of the ARQ through comparisons of risk behaviours and judgements in delinquent and nondelinquent male adolescents.

On the basis of past research and the proposals that have been put forth to explain risk-taking behaviour in adolescents, it is hypothesised that delinquent males will report significantly higher levels of risk-taking behaviour than their nondelinquent peers, delinquent males will perceive risk-taking behaviours to be less risky than nondelinquent males, and the latter group will perceive their parental attachments in more positive terms than will the delinquent males. However, there is not expected to be a difference between the two groups regarding peer attachment, since it is the peer group that is likely to differ rather than the quality of the relationship. Also, given the co-occurrence of conduct problems and depression that has been demonstrated in past research, it is expected that delinquent adolescents will report significantly higher levels of depression than school-based adolescents. Finally, given indications from past research that relationships between judgements of risk and actual behaviour differ in samples of adolescents with and without conduct disorder, we expect to replicate these findings. That is, we predict that there will be a negative relationship between risk-judgements and risk behaviours for school-based adolescents only.

Method

Participants

Two groups of adolescent males participated in the study. The delinquent sample consisted of 52 boys between the ages of 14 and 18 years, who were recruited from a state juvenile justice centre. The delinquent participants were either

in remand or had been sentenced for a variety of crimes, ranging in severity from burglary or car theft to arson or murder.

Thirteen- to eighteen-year-old boys, in Years 8 to 12, from nine secondary schools constituted the nondelinquent sample. The state and independent schools involved in the study were located in two metropolitan regions of Melbourne. An attempt was made to encompass adolescents from various socioeconomic, religious, cultural, and ethnic backgrounds.

Questionnaires were administered to 253 school-based male adolescents. However, 24 (9.49%) incomplete sets of questionnaires, plus 18 (7.11%) completed by boys younger than 13 years of age, were excluded resulting in a final nondelinquent sample size of 211. Although the sizes of the two participant groups are not equivalent, the disparity reflects the numerical difference between the populations from which each group was drawn.

The age distributions for the two participant groups were comparable. The age category containing the largest number of participants, for both the delinquents and nondelinquents, was 16 years, with mean ages of 15.89 ($SD = 0.83$) and 15.46 ($SD = 1.35$) for the two groups respectively.

Materials

Adolescent Risk-taking Questionnaire (ARQ).

The ARQ (Gullone et al., 2000) is comprised of two parts: a Risk Behaviour Scale and a Risk Judgements Scale. Each scale comprises 22 items. The Risk Behaviour Scale assesses the frequency with which adolescents participate in risk behaviours. For the present study, given the limited freedom of the adolescents in the juvenile justice centre, the instructions were changed to request information regarding how often the adolescent would participate in risk behaviours if they were given the opportunity. The Risk Judgements Scale measures adolescents' perceptions of the level of risk entailed in the 22 behaviours. For details of the ARQ's development, see Gullone et al. (2000).

For each item in the Risk Behaviour Scale, participants were required to endorse one of five responses: 0 (*would never do*), 1 (*would*

hardly ever do), 2 (*would do sometimes*), 3 (*would do often*), and 4 (*would do very often*). This contrasts with the standard response format, which ranges from 0 (*never*) to 4 (*very often*). Similarly, the Risk Judgements Scale involves a 5-point Likert response format. For each item, adolescents are required to indicate whether they believe the particular behaviour to be (0) *not at all risky*, (1) *not very risky*, (2) *risky*, (3) *very risky*, or (4) *extremely risky*. By summing up the item responses in each scale, a total Risk Behaviour score and a total Risk Judgements score can be obtained.

The ARQ has been demonstrated to have good internal consistency and good 1-week test-retest reliability. Cronbach's alpha analyses, computed for males, females, and different age groups, on the whole have yielded coefficients exceeding 0.8. Test-retest reliability coefficients have been shown to range between 0.6 and 0.8.

In addition, Gullone et al. (2000) reported a four-factor structure, for each of the behaviour and judgements scales of the ARQ, which was supported by confirmatory factor analysis. The four factors are thrill-seeking risks (example items: snow skiing, rollerblading), rebellious risks (example items: smoking, staying out late), reckless risks (example items: driving without a licence, having unprotected sex), and antisocial risks (example items: talking to strangers, cheating).

Inventory of Parent and Peer Attachment

(**IPPA**). The IPPA (Armsden & Greenberg, 1987) assesses the perceived quality of an adolescent's affective bond with his/her parents and peers. It contains two sections: a 28-item measure of parent attachment and a 25-item measure of peer attachment. For each question, respondents endorse one of six alternatives: 0 (*never true*), 1 (*almost never true*), 2 (*seldom true*), 3 (*sometimes true*), 4 (*often true*), or 5 (*almost always true*).

Good convergent validity has been demonstrated through correlations between the parent and peer attachment scales with measures of family environment (i.e., the Family Environment Scale), psychological wellbeing (i.e., the Tennessee Self-concept Scale), and

stressful life events (Armsden & Greenberg, 1987).

Three factors have been found for each of the IPPA scales (i.e., trust, communication, and alienation). The internal consistency coefficients for the factors, as determined by Cronbach's alpha, range between .72 (peer alienation) and .91 (parental trust). Three-week test-retest reliability correlation coefficients are also high (.93 for parent attachment and .86 for peer attachment) (Armsden & Greenberg, 1987). The scoring of the IPPA is such that, the higher the score on the overall scale and each of its factors (with the exception of alienation), the stronger and more functional the attachment.

Reynolds Adolescent Depression Scale (RADS). The RADS (Reynolds, 1987) is a scale designed specifically for measuring the severity of depressive symptomatology in adolescents between the ages of 13 and 18 years. It consists of 30 items incorporating a 4-point response format on which adolescents indicate whether each statement applies to them (1) *almost never*, (2) *hardly ever*, (3) *sometimes*, or (4) *most of the time*. Higher scores indicate a greater level of depressive symptomatology, with a score higher than 77 suggesting clinical depression.

The convergent validity of the RADS has been demonstrated to be sound through strong correlations with other measures of depression, including the Beck Depression Inventory and the Self-rating Depression Scale. The RADS has also been demonstrated to have good discriminant validity and content validity. The internal consistency of the scale is excellent, with a Cronbach's alpha coefficient of .92 and a split-half reliability coefficient of .91. A test-retest reliability coefficient of .79 has been obtained for a 3-month period (Reynolds, 1987).

Procedure

Prior to approaching potential participants, approval was obtained from the university ethics committee, the Department of Education, school principals, and managerial staff from a juvenile justice centre in metropolitan Melbourne, Australia.

Nondelinquent participants. Students of non-delinquent status who were approached to take part in the study were from classes that were randomly selected by either the school principal or the year-level coordinator. Explanatory statements and consent forms were distributed to 450 boys in the nominated classes. The response rate was 56.2% (253) due to the failure of many boys to return the form that required both parental and participant signatures of consent.

The questionnaires were administered during school hours to the consenting boys in a quiet and undisturbed classroom by the second author. The sizes of the groups tested varied from 9 to 40. The purpose of the study was verbally explained to the participants prior to their completing the questionnaires. The boys were aware that the survey consisted of questions about risk-taking and how teenagers feel about their parents and their peers. However, rather than explicitly referring to depression, which may have biased the responses, the RADS was presented as a questionnaire about the self.

The boys were instructed that participation was completely confidential and voluntary, and that they could withdraw from the study at any stage. Independent and honest responses were requested. It was also emphasised that there were no right or wrong answers and that the researcher would answer any questions of clarification as they arose. The questionnaires, which were administered in counterbalanced order across groups, required approximately 30 to 40 minutes for completion.

Delinquent participants. Having been granted access to the juvenile justice centre detainees, the second author recruited participants by visiting each of the residential units and informing both boys and staff about the study. It was emphasised to the boys that the survey was confidential and anonymous and that there would be no adverse repercussions for honesty.

All boys in the custody of the juvenile justice centre during the testing period, which spanned the months of June and July, except for 75% of those in one of the four residential units, were willing to be involved in the study. Due to variation in literacy skills, the questionnaires

were read to each boy on an individual basis in a quiet room at the centre, thereby ensuring a standardised procedure across delinquent participants. To simplify their task, the boys were provided with enlarged versions of the response choices (30- x 10-centimetre cards with each response option numbered). This was of particular assistance to boys with poor reading skills. The questionnaires were presented in a specific order to all delinquent participants, beginning with the Risk Behaviour Scale and the IPPA, then the RADS and finishing with the Risk Judgements Scale. This served the purpose of establishing participant interest and rapport and of counteracting any negative emotions that may have been aroused during the testing procedure. A total time requirement of between 30 and 60 minutes was involved in administering the questionnaires. At the completion of testing, participants were given the opportunity to ask questions or to comment on the study. To reward their cooperation, each boy received a chocolate bar on completion of the session.

Results

For the following analyses, it is noteworthy that, the higher the score on each of the risk behaviour factors, the stronger the expressed desire to engage in the particular type of risk behaviour. Also, the higher the risk judgement score for each of the factors, the higher the perception of danger or risk associated with the particular behaviour(s). Regarding attachment, for the trust and communication factors, a high score is indicative of healthy or functional attachment. In contrast, a high score on the alienation factor is indicative of poor or dysfunctional attachment.

Initial analyses were conducted to confirm the internal consistency of the ARQ. For the overall risk beliefs scale, Cronbach's alpha was found to be .70 for the delinquent youth and .83 for the school-based adolescents. For the overall risk behaviours scale, alpha was .87 for the delinquent youth and .89 for the school-based youth.

To investigate the convergent validity of the ARQ, we examined correlations between the factors (both behaviour and judgement) of the ARQ and the factors (both parent and peer) of

the IPPA. Pearson's product-moment correlation coefficients are given in Table 1.

It is evident from Table 1 that there were consistently significant correlations between the ARQ and IPPA parent attachment factors for the nondelinquent group of adolescents. However, apart from the reckless risk behaviours factor of the ARQ, there were no significant correlations with parent attachment for the delinquent group. In contrast, for the school-based adolescents, the parent trust and communication factors correlated negatively and consistently with all risk behaviour factors except the thrill-seeking factor, for which there were no significant correlations. Also for this group, the alienation factor for parent attachment correlated positively with all risk factors except for the thrill-seeking factor. With regard to risk judgements, the results were almost a mirror image of those for risk behaviour. That is, risk judgement, on the whole, correlated positively with the parent communication and trust factors but negatively with the alienation factor. Also, significant correlations were restricted to the school-based adolescent group.

The results for peer attachment contrasted quite markedly from those for parent attachment. For both groups of adolescents, there were very few significant correlations between the ARQ and peer attachment factors. The strongest correlations were found between the peer trust and communication factors and the thrill-seeking risks factor for the delinquent group only.

To establish the discriminant validity of the ARQ, in addition to examining the descriptive statistics for each of the variables examined across the two groups, statistical analyses of the differences were carried out using discriminant function analysis. However, prior to examining differences between the two groups on the ARQ, we examined whether the two groups differed on depression and parent attachment in the direction that would be expected on the basis of past research.

The means and standard deviations for each of the attachment factors (parents and peers) as well as depression, by delinquent status, are given in Table 2. An independent groups *t* test with depression as the dependent variable

TABLE 1

Pearson's Product-Moment Correlation Coefficients for the Risk Behaviour and Risk Judgement Factors of the ARQ with the Parent and Peer Attachment Factors of the IPPA

ARQ factors	Parent attachment factors			Peer attachment factors		
	Trust	Comm.	Alienation	Trust	Comm.	Alienation
Rebellious risk behaviours						
Delinquent group	-.05	-.07	.06	.18	.03	-.19
Nondelinquent group	-.23**	-.20**	.19**	.08	.14*	-.08
Thrill-seeking risk behaviours						
Delinquent group	-.20	-.10	.26	.34*	.40**	.09
Nondelinquent group	.04	-.01	-.02	.06	-.04	-.11
Antisocial risk behaviours						
Delinquent group	-.17	.05	-.02	.17	.21	.01
Nondelinquent group	-.33***	-.30***	.21**	-.12	-.14*	.02
Reckless risk behaviours						
Delinquent group	-.25	-.29*	.35*	.07	.02	-.14
Nondelinquent group	-.24***	-.24**	.16*	-.04	-.08	.00
Rebellious risk judgements						
Delinquent group	.22	.25	-.08	.09	.23	.11
Nondelinquent group	.22**	.23**	-.19**	-.07	-.09	.04
Thrill-seeking risk judgements						
Delinquent group	.19	.20	-.04	-.08	-.21	.12
Nondelinquent group	.16*	.17*	-.11	-.11	.01	.19**
Antisocial risk judgements						
Delinquent group	.10	.16	-.14	-.14	-.07	.25
Nondelinquent group	.21*	.27***	-.15*	-.03	.02	.08
Reckless risk judgements						
Delinquent group	.14	.21	-.10	.06	.14	.10
Nondelinquent group	.26***	.26***	-.19**	.08	.05	-.04

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

yielded a significant difference between the two groups of male adolescents, $t(261) = 5.61$, $p < .001$. As is evident from examination of Table 2, the delinquent group scored higher than the nondelinquent group on depression. This difference is particularly striking regarding the occurrence of clinical depression, with 34.6% of the delinquent respondents and 9.0% of the nondelinquent respondents obtaining a score in excess of the suggested clinical cut-off of 77.

To examine the differences between the two groups on peer and parent attachment, the six attachment factors (i.e., peer alienation, communication, and trust; and parent alienation, communication, and trust) were entered as the

discriminating variables into a discriminant function analysis with delinquent status as the grouping variable. This analysis was significant, Wilks's lambda (6) = 0.93, $p < 0.01$, and correctly classified 80.99% of cases. As can be seen in Table 2, the delinquent group scored higher on parent alienation but lower on parent communication and trust. No differences were found between the two groups on the peer attachment factors. Correlations between the parent attachment factors and the discriminant function were as follows: parent communication (.81), trust (.79), and alienation (-.62).

Comparisons between the two groups of male adolescents on the risk judgement and risk

TABLE 2

Differences Between Delinquent and Nondelinquent Group Means for Depression, Parent Attachment Factors, and Peer Attachment Factors

Variable	Sample				Significance <i>p</i> <
	Delinquent		Nondelinquent		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Depression	69.04	13.78	57.31	13.42	.001
Parent attachment					
Alienation	27.75	9.33	23.18	10.70	.01
Communication	19.48	9.36	24.21	8.01	.001
Trust	29.87	10.86	34.75	8.15	.001
Peer attachment					
Alienation	13.69	4.72	14.20	5.63	<i>ns</i>
Communication	27.42	10.00	27.03	8.45	<i>ns</i>
Trust	34.79	8.22	33.41	7.38	<i>ns</i>

Note. Given differing numbers of items in the parent and peer attachment factors, relative score comparisons are not meaningful. *ns* = Nonsignificant difference between the two groups.

behaviour factors were also examined through the use of discriminant function analyses. The four risk judgement factors were entered into an analysis as the discriminating variables, with delinquent status as the grouping variable. This analysis yielded a significant result, Wilks's lambda (4) = 0.88, $p < 0.0001$, and correctly classified 79.09% of cases. The correlation between the discriminating variable and the discriminant function is given in parentheses for the significant discriminating variables, which were the rebellious risks factor (.85) followed by the reckless risks factor (.38). As can be seen in Table 3, the adolescents from the juvenile justice centre scored significantly lower than the school-based adolescents on both factors.

As for risk judgements, the analysis for the risk behaviour factors of the ARQ incorporated the factors as discriminating variables and delinquent status as the grouping variable. The analysis for risk behaviour responses on the ARQ also yielded a significant result, Wilks's lambda (4) = 0.61, $p < 0.0001$, and correctly classified 87.45% of cases. Again, the correlation between the discriminating variable and the discriminant function is given in parentheses for the significant discriminating variables which, as for risk judgements, were the reckless risks factor (.78) and the rebellious risks factor (.75). Table 3

shows that the results were the direct opposite of the risk judgements outcome. Specifically, male adolescents from the juvenile justice centre scored higher on both factors compared to the school-based adolescents. For both risk judgement and risk behaviour comparisons, no differences between the two groups were found on the antisocial and thrill-seeking factors.

Correlations Between the Risk Behaviour and Risk Judgements Scores by Delinquent Status

Table 4 contains the correlation coefficients between the risk behaviour and risk judgement factors by delinquent status. What is most evident is that risk judgements and risk behaviours are generally negatively related. However, it appears that, on the whole, these relationships are stronger and more consistent for the school-based adolescents. In particular, for these adolescents, the correlations between judgements and behaviours are strongest within rather than across factors. This contrasts with the juvenile justice centre youth, for whom the correlations appear more random. Of particular note for this group are the generally larger negative correlations between rebellious risk behaviour and risk perception for all four ARQ factors. A similar outcome for this group appears on the reckless risks behaviour factor.

TABLE 3

Differences Between Delinquent and Nondelinquent Group Means for the Four Risk Behaviour Factors and the Four Risk Judgement Factors

Variable	Sample				Significance <i>p</i> <
	Delinquent		Nondelinquent		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Risk judgements					
Antisocial	9.85	3.38	10.60	3.57	<i>ns</i>
Rebellious	7.25	3.85	10.55	4.25	.0001
Reckless	13.63	4.11	14.99	3.68	.05
Thrill-seeking	9.10	4.20	8.93	4.06	<i>ns</i>
Risk behaviour					
Antisocial	6.96	3.36	6.64	3.49	<i>ns</i>
Rebellious	14.90	3.65	8.31	4.81	.0001
Reckless	9.75	4.51	4.28	3.47	.0001
Thrill-seeking	13.35	6.02	13.07	5.33	<i>ns</i>

Note. Given differing numbers of items in the risk behaviour and belief factors, relative score comparisons are not meaningful. *ns* = Nonsignificant difference between the two groups.

TABLE 4

Pearson's Product-Moment Correlation Coefficients Between Risk Behaviour and Risk Judgement Factors by Delinquent Status

Risk behaviour factor	Risk judgement factor			
	Rebellious	Thrill-seeking	Antisocial	Reckless
Rebellious				
Delinquent group	-.44**	-.42**	-.59**	-.32*
Nondelinquent group	-.54***	-.23**	-.27***	-.30***
Thrill-seeking				
Delinquent group	.11	-.22	.10	.12
Nondelinquent group	-.09	-.37***	-.17*	-.19**
Antisocial				
Delinquent group	-.06	.04	-.12	.09
Nondelinquent group	-.23**	-.23**	-.45***	-.33***
Reckless				
Delinquent group	-.33*	-.25	-.39**	-.22
Nondelinquent group	-.21**	-.16*	-.23**	-.38***

* = *p* < .05. ** *p* < .01. *** *p* < .001.

Discussion

Gullone and colleagues' (2000) study reported data indicating good reliability (i.e., internal consistency and 1-week test-retest) for the ARQ, as well as good construct validity. Reliability analyses with the current data confirmed past

results. Adequate internal consistency for each of the risk behaviour and risk beliefs scales was demonstrated for both samples, although coefficients for both scales were found to be higher for the school-based youth.

The major aim of the present study was to further examine the validity of the ARQ. Past

research has indicated that adolescent problem behaviours and conduct disorders are associated with nonsupportive parent-child relationships and with peer cultures characterised by problem behaviours (e.g., Levitt et al., 1991). It has also been indicated that conduct disorders co-occur with clinical depression at a rate higher than chance (Capaldi & Stoolmiller, 1999; Dryfoos, 1993). Thus, it was important in this study to determine that, for the sample of male adolescents recruited from a juvenile justice centre, these characteristics were indeed evident. The results were supportive in that comparisons between the school-based sample of male adolescents and the juvenile justice centre adolescents revealed that, for the former group, parent attachment was reported in more positive terms and self-reported depression was significantly lower. Specifically, these adolescents reported significantly higher levels of parent trust and communication but lower levels of parent alienation on the IPPA compared with the juvenile justice centre youth. Also, a large proportion of adolescents from the latter group scored within the clinical range for depression (i.e., 34.6% compared with 9.0% for the school-based adolescents).

It was also predicted that peer and parent attachment would be significantly associated with risk-taking behaviours and judgments for the delinquent group of adolescents but that, for the school-based group, only parent attachment would be significantly associated with ARQ factors. This prediction was only partly supported by the results since, on the whole, there were very few significant correlations found for the juvenile justice centre youth for both parent and peer attachment. This may, in part, have been the result of the smaller sample size for this group since several correlations of similar magnitude to significant correlations for the school-based sample did not reach significance. However, it is more likely to be a real difference since, on the whole, coefficients were of larger magnitude and more consistent for the school-based sample. Nevertheless, although these are not the findings that were expected, they do indicate that the ARQ is sensitive to group differences.

Further, for the school-based sample, these results do to some extent support past research

that risk-takers are more likely to be less optimally bonded with their parents (c.f. Levitt et al., 1991). Those school-based adolescents who reported engaging in higher levels of risk-taking and who generally perceived risk behaviours to be less risky were also those who perceived their relationships with their parents to be characterised by lower levels of trust, poorer communication, and higher levels of alienation.

Discriminant validity of the ARQ was directly examined by comparing the two groups on the judgement and behaviour ARQ factors. Strong support was found in that the rebellious and reckless risk judgement factors significantly discriminated between the two groups of adolescents (i.e., 79% of cases were correctly classified). Regarding the risk behaviour factors, again it was the rebellious and reckless risks factors that significantly discriminated between the two groups (i.e., 88% of cases were correctly classified). The direction of differences on these factors was consistent with past research (e.g., Lavery et al., 1993) and with our hypothesis that delinquent males would report significantly higher levels of risk-taking behaviour than their nondelinquent peers but lower levels of riskiness associated with the behaviours than nondelinquent males. The fact that the antisocial and thrill-seeking factors did not significantly discriminate between the two groups is not particularly surprising, since delinquency status would not be expected to be characterised by higher levels of thrill-seeking behaviours (which are socially acceptable and legal) nor of antisocial behaviours, the latter of which are represented in the ARQ as minor societal infringements such as cheating or teasing people.

Nevertheless, the present study is limited to some extent by the smaller group of juvenile justice centre males compared with the school-based sample. Comparing within sample statistics between the two groups is somewhat restricted by this difference in sample size. However, this limitation only applies to comparison of the correlations across the two groups. The discriminant function analyses and the independent groups *t* test were adjusted for the variability in size between the two groups and within group variance. Secondly, convergent validity

assessment of the ARQ could have been strengthened through investigation of correlations between the ARQ and other adolescent risk-taking measures. Future research should also examine these psychometric properties in female adolescents and other groups of adolescents.

Notwithstanding its limitations, this study has contributed to knowledge about the psychometric properties of the ARQ. On the whole, the results support our predictions and thereby reinforce the utility of the ARQ for the valid and reliable assessment of adolescent risk-taking beliefs and behaviours.

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