RISK: Health, Safety & Environment (1990-2002)

Volume 11 | Number 4 Article 4

September 2000

Age Differences in Personal Risk Perceptions: A Note on an Exploratory Descriptive Study

Juanita V. Field

George E. Schreer

Age Differences in Personal Risk Perceptions: A Note on an Exploratory Descriptive Study

Abstract
The authors test for differences in risk perceptions among different age groups.

Keywords
risk taking, chronological age, risk assessment

Age Differences in Personal Risk Perceptions: A Note on an Exploratory Descriptive Study

Juanita V. Field & George E. Schreer*

Introduction

Age is the primary independent variable in developmental psychology research. Such research is often descriptive in nature: it involves comparing participants of different ages with regard to some behavior (the dependent variable) in order to determine whether the behavior may be differently described for different age groups. Knowing how perception of risk varies with age has practical significance as well as theoretical importance. The purpose of the current research is to examine how risk perception varies with age.

Using typical social science format, this paper will first review the literature related to developmental perception of risk. Then the method used in the current study will be presented, followed by the statistical results and, finally, a discussion of our conclusions and their implications.

While no studies were found using age as the independent variable and risk perception as the dependent variable, there are numerous studies reported in the literature which examine personal risk and preventive behaviors in children and adolescents. Most of these studies are concerned with discovering relationships that may be used to discourage risky behaviors (smoking, drinking) and encourage preventive behaviors (exercise, healthy diet).[1]

* Professor Field is Chair of the Psychology Department, Plymouth State College. She holds a Ph.D. (Lifespan Developmental Psychology) from West Virginia University. *E-mail: jfield@oz.plymouth.edu.* Professor Schreer holds a Ph.D. (Social Psychology) from Syracuse University. He teaches in the Psychology Department, Manhattanville College.

1 *See, e.g.,* Barbara J. Tinsley et al., *A Multimethod Analysis of Risk Perceptions and Health Behaviors in Children,* 57 Educ. & Psychol. Measurement 197 (1997); Barbara P. Hazard & Che-Fu Lee, *Understanding Youth's Health-Compromising Behaviors in Germany: An Application of the Risk-Behavior Framework,* 30 Youth & Soc'y 348 (1999); Susan Moore & Eleanora Gullone, *Predicting Adolescent Risk Behavior Using a Personalized Cost-Benefit Analysis,* 25 J. Youth & Adolescence 343 (1996); Michael D. Resnick et al., *Protecting Adolescents from Harm: Findings from the National Longitudinal Study on Adolescent Health,* 278 JAMA 823 (1997).

Both the "Theory of Reasoned Action"[2] and the "Health Belief Model"[3] have been used as theoretical structures for research on risk; both assume rational behavior and both have been used to try to predict and control risk behaviors in different age groups. Neither model specifically addresses age as an independent variable in risk perception, although there is a recognition among scholars that age differences in perception of risk may influence behavior. For example, Moore and Gullone applied a personalized cost-benefit analysis based on the assumption that adolescents define risk differently from the way adults define it.[4] The authors correlated perception of risk with actual behavior and used the perception of positive and negative outcomes to explain why adolescents and adults might view risks differently. Specifically, Moore and Gullone found adolescents engaged in behavior that the adolescents knew was risky. Based on this finding, they argued that, for adolescents, the possibility of pleasant outcomes outweighed delayed or ambiguous negative outcomes which, for adults, might have had a more deterrent or threatening effect.[5] Moore and Gullone concluded that adult emphasis on the dangers of some behaviors might not be an effective strategy for deterring adolescent participation in the behaviors due to the differences in perceptions of positive and negative outcomes.[6] The necessity for altering models of rational behavior to include alternative meanings for different age groups is a strong argument for examining perception of personal risk as a function of age.

The literature also provides guidance in terms of methodology. Slovic, Fischhoff, and Lichtenstein provided a basic model for asking participants to rank risks.[7] Finucane and Maybery conducted a study in Australia and compared their results with other cross-cultural studies of rankings of the risks used in the original Slovic et al. study.[8] They

2 Icek Ajzen & Martin Fishbein, Understanding Attitudes and Predicting Social Behavior (1980).

3 N. Janz & M.H. Becker, *The Health Belief Model: A Decade Later,* 11 Health Educ. Q. 1 (1984).

4 Moore & Gullone, *supra* note 1.

5 *See id.*

6 *Id.*

7 Paul Slovic et al., *Rating the Risks,* 21 Env't 14 (1979).

8 *Id.;* Melissa L. Finucane & Murray T. Maybery, *Risk Perceptions in Australia,* 79 Psychol. Rep. 1331 (1996).

provided participants with 30 risk items on index cards; participants ordered the items from least risky to most risky and then rated each item for amount of risk in comparison to the other items. The definition of risk was present risk of death from the hazard. Finucane and Maybery concluded that while the five hazards ranked highest in risk were similar for Australians, Americans, Norwegians, and Hungarians, the differences suggested the necessity of investigating risk in specific populations and cultural groups.[9] It is a logical extension of this method to study participants of different age groups in order to determine whether the cross-cultural similarities and differences also apply across ages.

The current study developed from the literature concerning perception of personal risk and prevention among different age groups and the literature using the methodology of ranking risks. The purpose of this research is to describe differences in perception of personal risk in different age groups.

Method

Participants

Data was collected from 127 participants. Table 1 provides the frequencies of gender and age groups. Participants were tested in a public school, a summer program for adolescents, and college classes. The small number of participants in the youngest group reflects the difficulty of obtaining permission to contact young children in group situations, particularly through schools. At the summer program, parents were asked directly for permission to contact their children, and

Table 1
Number and Percent of Participants by Age Level and Gender

Gender	*Age Level*			
	8-9 Years	*11-15 Years*	*17-23 Years*	*Total*
Male	10 (7.8%)	31 (24.4%)	28 (22.05%)	69 (53.5%)
Female	4 (3.1%)	26 (20.5%)	28 (22.05%)	58 (45.7%)
Total	14 (11.0%)	57 (44.9%)	56 (44.1%)	

9 Finucane & Maybery, *supra* note 8.

all but two of those asked signed the parental consent letters. By contrast, seven of eight schools contacted would not give permission to send letters to parents. Parental permission in terms of informed consent was secured for all participants below college age. Adolescent and college student participants provided informed consent. Participants were from a relatively rural area of New England and attended small schools.

Materials

Questionnaires were developed specifically for this study. Risk behaviors were chosen on the basis of previous research, and participants were asked to rank the behaviors in order of perceived risk and also to rate the level of risk perceived to be associated with each behavior. For some of the behaviors, participants were also asked whether they participate in the behavior. Whenever possible, the items chosen were the same as those used by Slovic et al. and Finucane and Maybery.[10] There were, however, some limitations upon the use of the entire list from the previous studies. For example, the current study focused on perception of personal risk associated with one's own behavior, so broader hazards such as nuclear power and pesticides were excluded.

Because of the sensitive nature of some of the behaviors, only six were used with all methods and all age groups. It would have been inappropriate, for example, to ask eight-year-olds if they participate in unprotected sex. The behaviors used for all age groups were skiing, smoking cigarettes, playing soccer, playing computer games, drinking alcohol, and not wearing a seatbelt in a car. The older participants were also asked about using illegal drugs, using handguns, having unprotected sex, ignoring stop signs, mountain climbing, hunting, swimming, and biking. Some items were added to the list based on a previous study of these behaviors by the current investigators and colleagues.[11]

On the first questionnaire, given to all age groups, participants were asked to indicate on a four-point scale how risky each behavior was perceived to be and whether they participate in the behavior themselves.

10 Slovic et al., *supra* note 7; Finucane & Maybery, *supra* note 8.

11 *See* John Kulig et al., *Consensus Estimates of Risky Behaviors: False Consensus for Friends but not the General Population.* Poster presented at the NEPA Annual Mtg., Prov., RI (1998).

Rather than risk of death, as used in earlier studies, the questionnaire asked for ratings based on likelihood and degree of getting hurt. Again, this had to be appropriate for third graders, and to satisfy school authorities and parents that the questionnaire itself did not pose any risk to the participants. The second questionnaire, given only to the two older groups, provided fourteen behaviors on randomly arranged cards and asked participants to arrange the cards in order of risk. Participants were then asked to rate each behavior independently on a ten-point scale.

Design and Procedure

This was a cross-sectional study comparing three age groups; participants were tested in groups and responded to self-report questionnaires concerning their perceptions of risk associated with various behaviors. Three levels of age were delineated: 8-9 years (children), 11-15 years (adolescents), and 17-23 years (adults) based on the ages of the participants and the normal age grades in the culture. Data was analyzed using a number of statistical procedures described below. Since a number of statistical tests were conducted, a significance level of .01 was required to avoid capitalization on chance.

Results

To determine whether perception of risk for the six various behaviors (alcohol, computer, seatbelt, skiing, smoking, and soccer) varied with age, ANOVAs were calculated for each of the behaviors with age as the independent variable. A significant difference in risk ratings by different age levels was found only for skiing $F(2,123)=6.67$, $p=.002$. The youngest group (8-9 years) perceived skiing as significantly more risky than did the other age groups. Table 2 contains the mean risk ratings by age levels. No significant effects for gender were found; therefore, gender was not a variable in subsequent analyses.

For the older groups, scores were available for fourteen behaviors. Comparisons were made for the two older age groups (adolescent, 11-15, and adult, 17-23) by calculating t-tests using the ratings of risk as the measure of the dependent variable. Adults, compared to adolescents, rated skiing as significantly more risky: $t(98)=3.32$, $p=.001$. This was the only age difference found between the adult and

adolescent groups on the fourteen variables analyzed using ratings as the dependent variable. When the rankings were used as the dependent variable, Mann-Whitney tests revealed a significant difference between adults and adolescents in perception of risk for ignoring stop signs (p=.002). Adults gave higher risk rankings to ignoring stop signs as compared to adolescents.

Table 2
Mean Risk Ratings* by Age Level and Behavior (for ANOVA)

Behavior	*Age Level*		
	8-9 Years	*11-15 Years*	*17-23 Years*
Alcohol	3.9386	3.6429	3.5000
Computer	1.0000	1.3571	1.1607
Seatbelt	3.4286	3.4821	3.7143
Skiing	3.7143	2.9107	3.1250
Smoking	3.9286	3.6250	3.6786
Soccer	2.9286	2.4821	2.6607

* Rating of 1 to 4, 4=highest risk.

A cross-cultural and cross-time analysis was conducted by comparing relative rankings given by participants with rankings from the studies by Slovic et al. and Finucane and Maybery for the variables which the three studies examined in common.[12] Slovic et al. published rankings by U.S. participants in 1979, and Finucane and Maybery studied some of the same variables in 1996 in Australia.[13]

Table 3
Rankings of Risk Behaviors from Three Studies

Risk	*Ranks*		
	Finucane (1996) University	*Slovik (1979) College*	*Field (1999) Adoles & College*
Smoking	1	2	2
Drinking	3	3	3
Skiing	8	7	6
Handguns	2	1	1
Climbing	4	5	5
Biking	5	6	7
Swimming	6	8	8
Hunting	7	4	4

12 Slovic et al., *supra* note 7; Finucane & Maybery, *supra* note 8.

13 *Id.*

Thus, for the shared variables, adding the current study allows comparing rankings in the U.S. and Australia at three different points in time. Table 3 lists the common variables and the relative rankings in the three studies. A Friedman 2-way ANOVA found no significant differences between the ranks, given the same variables in two cultures at three different times.

Table 4 contains the rankings provided by adolescents and adults in the current study. Differences between adult and adolescent rankings are few and minor; this is consistent with the above results.

Table 4
Ranks of Risk Behaviors by Adolescents and Adults

	Age Level					
	Adolescent			*Adult*		
Behavior	*Mean*	*Median*	*Relative**	*Mean*	*Median*	*Relative**
Alcohol	5.41	5.00	5.0	6.20	6.00	6.5
Biking	10.69	11.00	11.0	11.07	11.00	11.0
Climbing	7.80	9.00	9.0	8.51	9.00	9.0
Computer games	12.78	14.00	14.0	13.20	14.00	14.0
Drugs	2.74	2.00	1.0	3.27	3.00	2.5
Guns	4.79	4.00	3.5	3.93	3.00	2.5
Hunting	6.93	7.50	8.0	7.75	8.00	8.0
Seatbelts	6.09	6.00	6.5	6.20	6.00	6.5
Sex (unprotected)	4.04	3.00	2.0	2.93	2.00	1.0
Skiing	9.61	10.00	10.0	9.25	10.00	10.0
Smoking	5.28	4.00	3.5	5.15	5.00	4.5
Soccer	11.91	13.00	13.0	11.60	12.00	12.5
Stop sign	6.20	6.00	6.5	4.78	5.00	4.5
Swimming	10.98	11.50	12.0	11.20	12.00	12.5

*Relative rank is rank within this array of median ranks.

In order to determine whether actual performance of the behavior was related to perception of risk, for the variables for which this data was collected on all participants (alcohol, computer, seatbelt, skiing, smoking, and soccer), Chi-square analyses with accompanying eta coefficients revealed significant relationships for (N=126) alcohol (p=.001, accounted for by high frequencies for adolescents) and seatbelt (p=.0002, accounted for by high frequencies for adolescents and adults). Thus, performance was related to perception of risk for alcohol by adolescents and for seatbelt by both adults and adolescents; participants who performed the behavior also perceived it to be risky.

Discussion and Conclusion

The most significant result of the current study is the finding of no age differences in perception of risk for most of the behaviors studied. The finding of no age differences in perception of risk for these behaviors means that people of all ages share a perception of how much risk is associated with each of the behaviors. Admittedly, the current study is exploratory, and the number of children was limited. However, given the limitations, the results do suggest that it may not be necessary to consider age as a factor in analysis of risk perception.

Perhaps one reason for the dearth of studies is the difficulty of collecting data from children. Our societal concern with protecting youngsters from risks may have resulted in children becoming unavailable as research participants as well as limitations on topics about which researchers may question children. Thus, knowing it is not necessary to test children would have significant practical value.

Finding no age differences in perception of personal risk has an important implication in addition to that discussed above. By third grade (8-9 years of age), we have made children aware of the personal risks we, as adults, want them to be aware of. The question then is whether the programs we supply to adolescents in an attempt to deter their risk-taking is over-kill, or even counterproductive. Adult efforts at deterrence identify the risks we are most concerned about. And the adolescent, developmentally predisposed to rebellion and risk-taking, knows exactly which behaviors to perform in order to create the most concern among adults. Applying Moore and Gullone's cost-benefit analysis, the positive outcomes associated with rebellion and risk-taking (particularly reinforcement from peers) in terms of adult concern and outrage may explain the attraction of behaviors which the adolescent has recognized as risky since at least age eight.[14] We concur with Moore and Gullone's conclusion that adult identification of risks and associated dangers may be an inappropriate strategy for reducing risk taking by adolescents.[15] This argument is not likely to be considered politically correct in the current climate, but it is a notion which should be explored with additional research. It may be that sensitizing children

14 Moore & Gullone, *supra* note 1.

15 *Id.*

to risks through about the third grade is all that is necessary or desirable.

It is interesting to note that the cross-culture and cross-time comparisons of rankings of risk behaviors identified commonality in how people in general perceive risk. Australians and Americans tended to rank risky behaviors in essentially the same order, and Americans have not changed with regard to that ranking over the last 20 years. Furthermore, the authors find it remarkable that these rankings were similar despite differences in instructions and procedures as well as differences in culture and time. The similarities must be incredibly robust to withstand the potential confounding influences of different times, cultures, instructions, and procedures. A finding of differences would have been easily explained; the finding of commonality is amazing under the circumstances.