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Risk attitudes and birth order

Philipp Krause, Johannes Heindl, Andreas Jung, Berthold Langguth, Göran Hajak and Philipp G Sand

Abstract

Risk attitudes play important roles in health behavior and everyday decision making. It is unclear, however, whether these attitudes can be predicted from birth order. We investigated 200 mostly male volunteers from two distinct settings. After correcting for multiple comparisons, for the number of siblings and for confounding by gender, ordinal position predicted perception of health-related risks among participants in extreme sports ($p < .01$). However, the direction of the effect contradicted Adlerian theory. Except for alcohol consumption, these findings extended to self-reported risk behavior. Together, the data call for a cautious stand on the impact of birth order on risk attitudes.

Keywords

birth order, extreme sports, personality, risk perception, risk-taking

Introduction

Individual differences in evaluating an activity's risks and benefits play an important part in adopting healthy lifestyles, in reducing our vulnerability to accidents and disease, and in ensuring the adherence to medical treatment (Comello and Slater, 2011). These differences are in part heritable traits (Roe et al., 2009) and in part acquired characteristics that may relate to birth order (Adler, 1925). Thus, firstborns would appear to avoid potentially dangerous sports and other dangerous activities (Casher, 1977; Jobe et al., 1983; Longstreth, 1970; Nisbett, 1968; Nixon, 1981; Rees et al., 2008; Sulloway and Zweigenhaft, 2010; Yiannakis, 1976) and to be more distrustful in investment games (Courtiol et al., 2009). When compared to laterborns, firstborns would also appear to be less attracted by traveling to distant destinations (Sulloway, 1996) and more reluctant to take financial risks (Gilliam and Chatterjee, 2011).

Despite a growing interest in environmental modulators of risk-taking, the role of birth order remains, however, disputed. On one hand, according to Adlerian theory, birth order imposes environmental constraints through parental expectations or feedback styles and sibling rivalry for parental investment in early childhood (Eckstein et al., 2010). Firstborns are said to be more conscientious, ambitious, academically oriented, conforming, conservative, inclined toward leadership, and respectful of their parents than their laterborn siblings. Children born later in the birth order would tend

University of Regensburg, Germany

Corresponding author:
Philipp G Sand, Department of Psychiatry and Psychotherapy, University of Regensburg, Universitaetsstrasse 84, 93053 Regensburg, Germany.
Email: philipp.sand@klinik.uni-regensburg.de

to be more unconventional, flexible, and rebellious (Sulloway, 1997). On the other hand, critics of the nurture hypothesis of risk-taking have argued that many facets of birth order dynamics remain difficult to control in empirical investigations, and methodological concerns have arisen from the failure to correct for sex, educational background, and other confounding variables in the past (Ernst and Angst, 1983).

As has been pointed out, the major challenge in estimating the attitude toward risk lies in the complexity of the trait (Brymer and Schweitzer, 2012; Wang et al., 2009; Willig, 2008). This implies that individuals may be risk-averse in one domain while they may still be willing to take risks in other domains (Hanoch et al., 2006). The present investigation was conceived to address the effect of birth order on five domains of risk perception and on self-reported risk behavior of young adults. To this avail, we examined two samples matched for age and sex that differed with regard to lifestyle and the level of risk exposure. By this approach, we sought to ensure that the measures used for evaluating risk perception were sensitive to the active engagement in everyday risk seeking.

Methods

Study populations

Two hundred young adults were investigated between December 2009 and June 2010 in compliance with the Helsinki declaration as revised in Seoul 2008. The study protocol was reviewed and approved by the ethics committee at the University of Regensburg.

Sample A (low risk exposure) was composed of 100 students between the ages of 18 and 40 years, enrolled at the University of Regensburg. Students were recruited either by direct approach on the medical school campus or by word-of-mouth.

Sample B (high risk exposure) was composed of 100 young adults who engaged in extreme sports. Disciplines included freestyle skiing, freeride snowboarding, downhill mountain-biking, freeride kayaking, and base-jumping. Volunteers were solicited at major competitions in the German, Austrian, Italian, and Swiss Alps and were matched for age and sex to sample A. By international rankings, all qualified as either high-level or top-level performers. Typically, potential participants were approached after registering for the event on the day before their respective race or challenge. As there are no official competitions for base-jumping, these participants were approached while preparing for jumps in the valley of Lauterbrunnen, Switzerland, a popular spot in the scene.

Procedure

A full description of the study was given, and each participant was handed an information sheet, which provided details about the nature of the study, what was expected of participants in the study, a guarantee of confidentiality, a reminder of the voluntary nature of his or her decision to participate, and where to obtain information regarding the results of the study when it was completed. All study participants provided written informed consent and received a cash incentive of €20. Participants were then handed an envelope with questionnaires and a key number, so that a buccal swab taken on the same occasion could be identified after questionnaires were returned. Buccal swabs were obtained to test for putative biomarkers of risk-taking behavior and will be addressed elsewhere. Envelopes containing the filled-in questionnaires were collected by the investigators immediately after completion.

Instrumentaria

Study participants were asked to provide anonymous sociodemographic information including the number of siblings and ordinal position (defined as the rank among all siblings in the index family) and completed the Domain-Specific Risk-Taking–German (DOSPERT-G) risk perception scale (Weber et al., 2002). In this instrument, a response is given to the degree

of risk associated with 40 behaviors (e.g. driving a car without a seatbelt and telling a friend's secret). Scores gauge an internal measurement of how risky each behavior is to a particular individual, and high scores stand for high estimates of risks. We supplemented DOSPERT with a structured form to sample risk-taking behavior in five domains, that is, drinking, drug-taking, risky sexual activity, reckless driving, and gambling, based on the Life Experiences Questionnaire (LEQ, Zuckerman and Kuhlman, 2000). Finally, Adult Attention-Deficit Hyperactivity Disorder Self-Report Scale Version 1.1 (ASRS V1.1) (Murphy and Adler, 2004) was used to screen for the presence of attention-deficit hyperactivity disorder (ADHD), an important confounder in the assessment of risk-taking (Drechsler et al., 2008). Endorsement of four or more of these symptoms at a threshold level constitutes a positive screen and is most predictive of a clinical diagnosis (Kessler et al., 2005).

Modeling of ordinal position effects and statistical analysis

Three models were used to examine ordinal position effects on risk perception and reported risk-taking. Model A tested for differences between firstborns and laterborns, model B tested for differences between middleborns and non-middleborns, and model C tested for differences between lastborns and the remaining ordinal positions. We refrained from examining all possible differences between individual birth order subgroups to avoid trade-offs in statistical power. Firstborns and only children were grouped together on the grounds of well-established similarities (Mellor, 1990). Data were analyzed by analysis of covariance (ANCOVA), correcting for the number of siblings and for the effect of gender (Gustafson, 1998). The significance level was set at $p = .05$. A Bonferroni correction was applied to account for the number of models tested ($p_{corr} = .05/3 = .016$). All calculations were performed with Intercooled STATA V8.0 (Stata Corporation, College Station, TX, USA).

Results

Sample characteristics and summary statistics

Overall, 208 subjects were approached of whom one student and seven participants in extreme sports declined to participate (3.8%). Characteristics of both samples are given in Table 1. Sample A was composed of 36 firstborns, 7 only children (counted as firstborns), 19 middleborns, and 38 lastborns. The number of siblings ranged from 0 to 7 (mean ± standard error of mean (SEM) = 1.6 ± 0.1) and was significantly larger in middleborns compared to firstborns and lastborns ($p < .001$, Table 1). One ASRS form was incomplete and was not counted. No items were missing from DOSPERT-G forms.

In sample B, we counted 27 firstborns, 6 only children (counted as firstborns), 20 middleborns, and 44 lastborns. Data on ordinal position were missing from three forms. The number of siblings ranged from 0 to 7 (mean ± SEM = 1.6 ± 0.1). All ASRS forms were complete but one DOSPERT form was returned blank by a middleborn participant. The respective numbers of firstborns, middleborns, and lastborns included in samples A and B were not predefined and did not differ significantly ($p > .24$). In sample B, educational level was not systematically assessed, but nine participants were unemployed.

Birth order effects on risk perception

DOSPERT total scores were distributed normally (sample A: Shapiro–Wilk test: $p > .27$, median = 115; sample B: Shapiro–Wilk test: $p > .24$, median = 109, Figure 1) and were lowest in firstborns (sample A: 114.8 ± 2.6, sample B: 104.9 ± 2.4), followed by middleborns (sample A: 115.5 ± 3.1, sample B: 110.7 ± 2.5), and lastborns (sample A: 118.6 ± 2.6, sample B: 113.1 ± 2.5, Figure 1). In sample B, lastborns exhibited higher scores than others ($p = .02$), but the significance disappeared after corrections were applied for multiple testing.

Table 1. Self-reported demographic characteristics, life experiences and ASRS scores of participants by birth order.

	University students (N = 100)						Participants in extreme sports (N = 97)					
	Firstborns (N = 43)	Middleborns (N = 19)	Lastborns (N = 38)	Model A	Model B	Model C	Firstborns (N = 33)	Middleborns (N = 20)	Lastborns (N = 44)	Model A	Model B	Model C
				$p_{\text{firstborns vs others}}$	$p_{\text{middleborns vs others}}$	$p_{\text{lastborns vs others}}$				$P_{\text{firstborns vs others}}$	$P_{\text{middleborns vs others}}$	$P_{\text{lastborns vs others}}$
Age (years) ± SEM	24.9 ± 0.3	25.1 ± 0.6	25.4 ± 0.5	NS	NS	NS	24.1 ± 0.9	26.4 ± 1.1	24.6 ± 0.7	NS	NS	NS
Men:women	35:8	17:2	32:6	NS	NS	NS	28:5	16:4	38:6	NS	NS	NS
Mean number of siblings ± SEM[a]	1.3 ± 0.1	2.5 ± 0.1	1.4 ± 0.2	NS	<.001	NS	1.5 ± 0.2	2.7 ± 0.3	1.4 ± 0.1	NS	<.001	.03
Sexual experience												
Has unprotected sex	3	2		NS	NS	NS	1	1	5	NS	NS	NS
Always	6 (0.15)	3 (0.18)	9 (0.24)				5 (0.15)	2 (0.10)	12 (0.27)			
Most of the time	10 (0.25)	4 (0.24)	6 (0.16)				11 (0.33)	6 (0.30)	10 (0.23)			
Rarely	17 (0.43)	4 (0.24)	14 (0.37)				11 (0.33)	6 (0.30)	10 (0.23)			
Never	7 (0.18)	5 (0.29)	7 (0.18)				4 (0.12)	5 (0.25)	6 (0.14)			
Not applicable	3 (0.08)	1 (0.05)	2 (0.05)				1 (0.03)	—	1 (0.02)			
Total number of sexual partners				NS	NS	NS				NS	NS	NS
0	—	1 (0.05)	2 (0.05)				1 (0.03)	—	1 (0.02)			
1	5 (0.12)	5 (0.26)	5 (0.13)				1 (0.03)	—	4 (0.09)			
2–5	19 (0.44)	6 (0.32)	13 (0.34)				7 (0.21)	4 (0.20)	8 (0.18)			
6–10	9 (0.21)	4 (0.21)	8 (0.21)				9 (0.27)	2 (0.10)	9 (0.20)			
10–50	10 (0.23)	3 (0.16)	9 (0.24)				8 (0.24)	11 (0.55)	17 (0.39)			
>50	—	—	1 (0.03)				7 (0.21)	3 (0.15)	5 (0.11)			
Practices birth control[a]		1		NS	NS	NS	1		5	NS	NS	NS
Never	—	1 (0.06)	1 (0.03)				1 (0.03)	—	3 (0.07)			
Rarely	1 (0.02)	—	2 (0.05)				4 (0.12)	2 (0.10)	3 (0.07)			
Most of the time	4 (0.09)	1 (0.06)	2 (0.05)				7 (0.21)	7 (0.35)	6 (0.14)			
Always	37 (0.86)	15 (0.83)	31 (0.82)				19 (0.58)	11 (0.55)	26 (0.59)			
Not applicable	—	1 (0.06)	2 (0.05)				1 (0.03)	—	1 (0.02)			

Table 1. (Continued)

	University students (N = 100)						Participants in extreme sports (N = 97)					
	Firstborns (N = 43)	Middleborns (N = 19)	Lastborns (N = 38)	Model A	Model B	Model C	Firstborns (N = 33)	Middleborns (N = 20)	Lastborns (N = 44)	Model A	Model B	Model C
				$p_{\text{firstborns vs others}}$	$p_{\text{middleborns vs others}}$	$p_{\text{lastborns vs others}}$				$P_{\text{firstborns vs others}}$	$P_{\text{middleborns vs others}}$	$P_{\text{lastborns vs others}}$
Drug experience												
Frequency of marijuana use in past year[a]			[1]	NS	NS	NS		[1]		NS	NS	NS
Never	23 (0.53)	11 (0.58)	21 (0.57)				12 (0.36)	6 (0.30)	18 (0.41)			
Up to once per year	13 (0.30)	4 (0.21)	9 (0.24)				8 (0.24)	4 (0.20)	7 (0.16)			
Monthly	3 (0.07)	2 (0.11)	5 (0.14)				9 (0.27)	4 (0.20)	8 (0.18)			
Weekly	3 (0.07)	2 (0.11)	2 (0.05)				3 (0.09)	2 (0.10)	4 (0.09)			
Daily	1 (0.02)	—	—				1 (0.03)	3 (0.15)	7 (0.16)			
Frequency of other drug use in past year[a]				NS	NS	NS				NS	NS	NS
Never	38 (0.88)	17 (0.89)	33 (0.87)				24 (0.72)	11 (0.55)	32 (0.72)			
Up to once per year	5 (0.12)	1 (0.05)	3 (0.08)				6 (0.18)	7 (0.35)	10 (0.23)			
Monthly	—	1 (0.05)	2 (0.05)				3 (0.09)	2 (0.10)	—			
Weekly	—	—	—				—	—	1 (0.02)			
Daily	—	—	—				—	—	1 (0.02)			
Total number of illegal drugs tried[a]				NS	NS	NS			[1]	NS	NS	NS
None	14 (0.33)	8 (0.42)	14 (0.37)				7 (0.21)	4 (0.20)	9 (0.20)			
1	20 (0.47)	9 (0.47)	18 (0.47)				12 (0.36)	6 (0.30)	18 (0.41)			
2–3	9 (0.21)	1 (0.05)	2 (0.05)				12 (0.36)	6 (0.30)	12 (0.27)			
More than 3	—	1 (0.05)	4 (0.11)				2 (0.06)	4 (0.20)	4 (0.09)			
Gambling experience												
Has gambled for money	31 (0.72)	17 (0.89)	29 (0.76)[1]	NS	.03	NS	22 (0.67)	16 (0.80)	33 (0.75)	NS	NS	NS
Largest amount lost/day (€ mean ± SEM)[a]	54.8 ± 22.0	19.4 ± 3.6	43.7 ± 20.0	NS	NS	NS	114.3 ± 41.9	46.7 ± 19.1	81.8 ± 30.2	NS	NS	NS
Largest amount won/day (€ mean ± SEM)[a]	132.5 ± 37.1	41.9 ± 8.7	186.3 ± 97.8	NS	NS	NS	336.4 ± 172.9	72.3 ± 28.4	474.8 ± 225.3	NS	NS	NS

(Continued)

Table 1. (Continued)

	University students (N = 100)						Participants in extreme sports (N = 97)					
	Firstborns (N = 43)	Middleborns (N = 19)	Lastborns (N = 38)	Model A	Model B	Model C	Firstborns (N = 33)	Middleborns (N = 20)	Lastborns (N = 44)	Model A	Model B	Model C
				$p_{\text{firstborns vs others}}$	$p_{\text{middleborns vs others}}$	$p_{\text{lastborns vs others}}$				$P_{\text{firstborns vs others}}$	$P_{\text{middleborns vs others}}$	$P_{\text{lastborns vs others}}$
Driving experience												
Has had driving license revoked or suspended[a]	2 (0.05)	—	3 (0.08)	NS	NS	NS	3 (0.09)	5 (0.25)	7 (0.16)	NS	NS	NS
Not applicable	2 (0.05)	—	3 (0.08)				—	—	—			
Uses cell phone while driving	32 (0.78)[2]	12 (0.63)	24 (0.63)	NS	NS	NS	28 (0.85)[1]	17 (0.85)	37 (0.84)[1]	NS	NS	NS
When approaching a yellow traffic light				.04	NS	.01	[1]		[1]	NS	NS	NS
Tends to slow down	5 (0.12)	4 (0.21)	12 (0.32)				8 (0.24)	5 (0.25)	13 (0.30)			
Tends to maintain speed	7 (0.16)	4 (0.21)	9 (0.24)				5 (0.15)	3 (0.15)	10 (0.23)			
Tends to accelerate	31 (0.72)	11 (0.58)	17 (0.45)				19 (0.58)	12 (0.60)	20 (0.45)			
Drinking experience												
Drives after having had two or more drinks[a]				NS	NS	NS	[1]		[1]	NS	NS	NS
Always	2 (0.05)	1 (0.05)	—				8 (0.24)	2 (0.10)	6 (0.14)			
Rarely	18 (0.42)	10 (0.53)	23 (0.61)				14 (0.42)	13 (0.65)	30 (0.68)			
Never	23 (0.53)	8 (0.42)	15 (0.39)				10 (0.30)	5 (0.25)	7 (0.16)			
Age at first intoxication by alcohol				NS	NS	NS				NS	NS	NS
Before 14 years	6 (0.14)	—	5 (0.13)				7 (0.21)	6 (0.30)	9 (0.20)			
14–16 years	20 (0.47)	13 (0.68)	17 (0.45)				13 (0.39)	6 (0.30)	23 (0.52)			
After 16 years	15 (0.35)	4 (0.21)	15 (0.39)				10 (0.30)	6 (0.30)	10 (0.23)			
Not applicable	2 (0.05)	2 (0.11)	1 (0.03)				3 (0.09)	2 (0.10)	2 (0.05)			

Table 1. (Continued)

	University students (N = 100)						Participants in extreme sports (N = 97)					
	Firstborns (N = 43)	Middleborns (N = 19)	Lastborns (N = 38)	Model A	Model B	Model C	Firstborns (N = 33)	Middleborns (N = 20)	Lastborns (N = 44)	Model A	Model B	Model C
				$p_{\text{firstborns vs others}}$	$p_{\text{middleborns vs others}}$	$p_{\text{lastborns vs others}}$				$P_{\text{firstborns vs others}}$	$P_{\text{middleborns vs others}}$	$P_{\text{lastborns vs others}}$
Maximum number of drinks/day in past year	[2]		[1]	NS	NS	NS	[1]		[1]	.01	.01	.006
0	2 (0.05)	—	—				2 (0.06)	1 (0.05)	1 (0.02)			
1–5	7 (0.17)	5 (0.26)	8 (0.22)				5 (0.15)	6 (0.30)	6 (0.14)			
6–10	22 (0.54)	6 (0.32)	17 (0.46)				13 (0.39)	6 (0.30)	12 (0.27)			
11–20	8 (0.20)	7 (0.37)	10 (0.27)				8 (0.24)	3 (0.15)	18 (0.41)			
>20	2 (0.05)	1 (0.05)	2 (0.05)				4 (0.12)	4 (0.20)	6 (0.13)			
ASRS score >3	5 (0.12)[1]	1 (0.05)	8 (0.21)	NS	NS	NS	12 (0.36)	8 (0.42)	11 (0.25)	NS	NS	NS
Social background				NS	NS	NS		[2]		NS	NS	NS
Unemployed	—	—	—				3 (0.09)	2 (0.11)	4 (0.09)			

ASRS: Adult Attention-Deficit Hyperactivity Disorder Self-Report Scale; ANCOVA: analysis of covariance; SEM: standard error of mean.
P values are uncorrected and refer to ANCOVA results controlling for the number of siblings and for gender.
[a]The Shapiro–Wilk test indicated that these items may have deviated from normality ($p < .01$) (numerical superscripts denote the number of missing values).

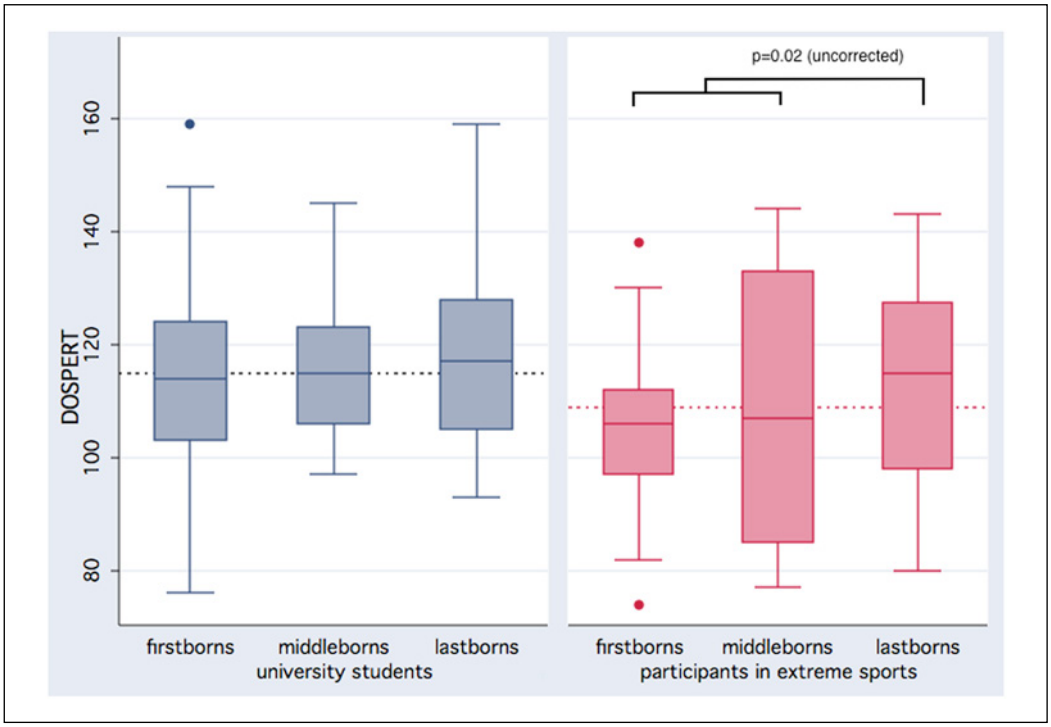

Figure 1. Distributions of DOSPERT total scores by ordinal position for university students (sample A: N = 100, median = 115) and for participants in extreme sports (sample B: N = 96, median = 109). The nominally significant difference between lastborns and other ordinal positions (p = .02, model C) in sample B disappeared after corrections for multiple testing. No other significant effects were observed for model A, B, or C.
DOSPERT: Domain-Specific Risk-Taking.

In the student sample, we noted a lower perception of risks associated with ethical decisions in firstborns relative to others (uncorrected p = .03, Table 2). Again, this p value became insignificant after Bonferroni correction. As for the remaining DOSPERT subscales, no major effects were noted (Table 2). Among participants in extreme sports, firstborns scored lowest on the perception of health/safety risks (uncorrected p = .0033), and lastborns scored highest on the perception of social risks (uncorrected p = .02). Participants without siblings achieved results similar to those of firstborns (DOSPERT total score for sample A: 114.4 ± 2.8, sample B: 105.6 ± 2.6). Pooling of only children with firstborns did not result in any noteworthy changes in either sample.

Birth order effects on risk-taking

Self-reported risk-taking was analyzed by ANCOVA, correcting for the number of siblings and gender (Table 1). With the exception of a significant effect of birth order on gambling for money in model B (uncorrected p = .04) and on driving behavior (approach to yellow traffic lights) in models A (uncorrected p = .04) and model C (uncorrected p = .01), no other effects emerged in sample A. For the latter item, lastborns reported the more cautious approach, that is, a tendency to slow down, whereas firstborns tended to accelerate more often. Assessments of additional items, for example, the use of mobile phones while driving and a history of driving license revocation/suspension were unremarkable. Similarly, birth

order had no significant impact on the number of sexual partners, the frequency of practicing unprotected sex, or on birth control. This also held true for experiences with drinking and experiences with drug-taking (Table 1). Lastborn members of sample B reported a significant excess in the maximum number of alcoholic drinks consumed per day (uncorrected $p = .006$). By ASRS scores, 14 subjects (14%) from sample A and 31 subjects (31%) from sample B fulfilled the criteria for probable ADHD, but there was no evidence of an increased likelihood of ADHD in subjects belonging to any of the three ordinal positions under investigation.

Discussion

The aim of the present investigation was to quantitatively assess birth order effects on risk perception and actual risk-taking in two independent settings. Based on a validated measure of risk perception, and on self-reports of life experiences in multiple domains, we cannot confirm the notion of risk-averse firstborns and risk-prone lastborns. Instead, firstborns appeared less risk-aware by DOSPERT scores and mostly less risk-averse by accounts of their own experience, when compared to laterborn subjects. Perception of health-related risks was the only parameter to exhibit significant effects of ordinal position that survived corrections for multiple testing. The direction of this effect was, however, opposite to the direction expected according to Adlerian theory.

While this is not the first investigation to challenge the concept of risk-loving lastborns (Cook and Bellis, 2001), only one prior study has used an operationalized approach to describe the relationship between risk perception and birth order (Morgan, 2009). Results from the earlier study compare to our findings in that oldest siblings tended to perceive fewer risks than did laterborns. In the present study, the sampling of fewer firstborns and more lastborns in sample B did not exceed the numbers expected by chance. Information obtained on past exposure to risky situations corroborates behavioral implications of risk perception and replicates recent data from a large survey (Dohmen et al., 2009): specifically, the differences observed in risk perception mirror the level of engagement in everyday risk seeking activities of samples A and B. This implies that risk perception can serve as a predictor of high risk lifestyles.

Differences in educational level and social background inequalities may offer an explanation for differential effects of birth order on risk perception and behavior in the two samples under study (Lee et al., 2008). Higher levels of alcohol consumption and unemployment tended to cluster in sample B. There is consensus regarding an inverse correlation of ordinal position and educational achievement in young adults (Fergusson et al., 2006; Gorman, 2008). Unfortunately, as we did not systematically record educational degrees and income levels, the relative weight of these factors remains difficult to assess in retrospect.

With regard to individual domains of risk perception, others have concluded to a lack of ordinal position effects on financial risk tolerance (Eckel and Grossman, 2008; Grable and Joo, 1999, 2000) or have been unable to confirm a role of birth order in predicting recreational risk-taking (Seff and Gecas, 1993; Sohi and Yusuff, 1991). Unless further factors such as the spacing or the gender of siblings (Elliott, 1992) impact strongly on the dependent variable, our observations indicate that birth order is not positively correlated with risk perception. Assuming that behavioral differences between siblings are genuine, independent traits, for example, competitiveness, may come into play (Carette et al., 2011). We acknowledge that the majority of participants in the present investigation were men, and extrapolations to women are more tentative at this stage.

On the whole, our data advocate a cautious stand on the role of birth order in shaping risk perception or risk-taking behavior. In young men, the chances of observing an increase in risk perception with ordinal position are higher than the chances of observing a decrease. Part of the effect may be due to educational and social background. These issues will need to be

Table 2. Differences in risk perception by birth order (ANCOVA controlling for gender and the number of siblings).

DOSPERT Risk perception scale (items)				Model A	Model B	Model C
University students (N = 100)						
	Firstborns (N = 43)	Middleborns (N = 19)	Lastborns (N = 38)	$p_{firstborns}$ vs others	$p_{middleborns}$ vs others	$p_{lastborns}$ vs others
Ethical decisions (8)	24.6 ± 0.8	26.5 ± 1.0	26.8 ± 0.7	.03	NS	NS
Financial decisions (8)	24.4 ± 1.0	24.1 ± 1.3	25.9 ± 0.9	NS	NS	NS
Health/safety decisions (8)	26.0 ± 0.7	25.6 ± 1.0	26.2 ± 0.7	NS	NS	NS
Recreational decisions (8)	23.4 ± 0.8	23.5 ± 1.2	23.3 ± 0.8	NS	NS	NS
Social decisions (8)	16.3 ± 0.6	15.9 ± 0.6	16.4 ± 0.5	NS	NS	NS
Participants in extreme sports (N = 96)						
	Firstborns (N = 33)	Middleborns (N = 19)	Lastborns (N = 44)	$p_{firstborns}$ vs others	$p_{middleborns}$ vs others	$p_{lastborns}$ vs others
Ethical decisions (8)	22.6 ± 0.7	23.7 ± 1.5	24.5 ± 0.8	NS	NS	NS
Financial decisions (8)	24.4 ± 1.0	24.3 ± 2.0	26.4 ± 0.8	NS	NS	NS
Health/safety decisions (8)	22.2 ± 0.9	25.7 ± 1.1	24.3 ± 0.7	.003	.02	.01
Recreational decisions (8)	19.6 ± 0.9	19.6 ± 1.1	20.2 ± 0.7	NS	NS	NS
Social decisions (8)	16.1 ± 0.7	17.3 ± 1.0	17.7 ± 0.7	NS	.05	.02

ANCOVA: analysis of covariance; DOSPERT: Domain-Specific Risk-Taking.
DOSPERT scores are given as mean ± standard error of mean (SEM).

addressed in future studies with a balanced gender design and, preferably, using additional age groups.

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