

Risk-taking attitudes and behaviors in the Norwegian population: the influence of personality and background factors

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ABSTRACT



The article presents the results of an investigation where the main purpose was to see how willingness to take risks is distributed in the general adult population relative to socio-demographic background and personality. A representative sample ($n=1000$) of the population 15 years and older was interviewed about socio-demographic background, personality type (Big Five, EPQ, Sensation Seeking) and willingness to take risks. We used a new scale containing eight dimensions, covering social, intellectual, achievement, political, economic, physical, ethical and existential types of risk. The results showed that people in general were risk averse in relation to physical, ethical, economic and existential risks but had a balanced bell-shaped distribution of scores on the other risk dimensions. There was a moderate to low positive correlation between all eight risk-taking dimensions except achievement risk versus ethical risk. Males were more willing to take risks than females on six of eight dimensions. Younger were more willing than older to take risks on all eight risk dimensions. Higher educational level influenced risk-taking positively in more than half of the dimensions, not only one's own educational level but also father's and even more mother's educational level. There was a positive correlation with household income on three dimensions. All sensation seeking subscales and total sensation seeking correlated positively with all risk-taking dimensions. There were positive correlations with most risk-taking scales on EPQ's Extraversion and Psychoticism and Big Five's Extraversion, Stableness and Openness. Agreeableness and Conscientiousness had negative correlation with several risk-taking dimensions. A logistic regression model, identifying the 25 percent highest scorers on total risk-taking, found that being male and scoring high on sensation seeking were the most important predictors. Furthermore, high scores on the Big Five subscales Extraversion and Openness, as well as the Eysenck EPQ sub-scales Extraversion and Psychoticism predicted high willingness to take risks.

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Introduction

The concepts of 'risk' and 'risk-taking' have become important for understanding attitudes and behavior in present societies. Although the world may have become safer in many ways, sociologists like Beck (1992) characterize modern society as a 'risk society'. Furedi (1997) calls it our obsession with risk. Media and scholarly works tell us about financial instability, natural hazards, suicide bombers, terrorist attacks, extreme risk sports and experimentation with lifestyles (Torres 2017), which point, if not to a risk society, then to a new, broader and more complex global risk picture. The new awareness of risk leads to questions concerning how people perceive, evaluate and react to risk. The purpose of the present study was to find out how the general adult population reacts to risk and risk-taking in various areas of life. Most studies examine specific samples or groups of people. In our study we have used a representative sample of the Norwegian population aged 15 years and above. We think this contributes to the uniqueness of our study. The study was initiated as part of a broader project, 'Learning under Risk', where a central goal was to investigate how military personnel learn to operate in an atmosphere of risk before, under and after deployment (Sookermary, Sand, and Breivik 2015; Breivik, Sand, and Sookermary 2019). Important in the project was to find out how military attitudes to risk and risk-taking differ from attitudes in the general population. In an earlier article we looked at how the personality construct 'Sensation Seeking', which we found important in military contexts, was related to risk-taking in the general population (Breivik, Sand, and Sookermary 2017). We found that in the general population Sensation Seeking was intimately associated with various forms of risk-taking attitudes and behaviors. In the present article the focus is broader; looking at whether risk-taking attitudes and behaviors in the general population are associated with specific personality factors as well as socio-demographic background.

Earlier population-based studies of risk-taking typically refer to socio-demographic background but not to personality (see Dohmen et al. 2005; Noussair, Trautmann, and van de Kuilen 2014). This is also the case with the study of Internet gamblers by Griffiths et al. (2009). Several recent studies of specific groups of people indicate the importance of personality factors on risk-taking. This is found in studies using large datasets such as that by Lange (2012) of self-employed workers, as well as Espíritu-Olmos and Sastre-Castillo (2015) study of entrepreneurs. While many personality studies use socio-demographic factors as control variables, a few studies, such as the study by Taubman-Ben-Ari and Yehiel (2012) of driving styles, use both personality and socio-demographic factors as explanatory factors. This is also the case in our study. Our study thus tries to fill a gap by including both personality and socio-demographic background as well as risky experiences as explanatory factors to better understand the role of different dimensions of risk-taking in people's lives. Our study is based on an extended version of the person x situation model, where the person is identified by background factors as well as personality. Recent versions of the interaction perspective maintain that the effect of person and situation depends on each other, which means that people often choose situations that reflect their personalities (Funder 2010). Authors like Fleeson and Nofhle (2008) therefore maintain that the person x situation debate has ended in a synthesis. Traits are not in general predictive of cross-situational consistency, but predictive of consistency for a variety of specific behaviors over time. In our study we thus try to target general attitudes that may be predictive dispositions that will act over time. Our study is in some ways similar to the population-based study of risk-taking connected with computer harm by Herrero, Urueña, Torres, and Hidalgo (2017), where it is suggested that the two key inputs to risk-taking are risk perception (situation) and risk propensity (person). In addition to targeting general dispositions toward risk we also wanted to find out how willing people would be to participate in specific dangerous activities, such as risky sports, risky jobs and risky military operations.

An important theoretical premise in our study was that risk contains negative as well as positive possibilities and opportunities. In traditional economy and risk management literature risk is

typically understood as something negative, as the possibility of a loss of some kind. According to Yates and Stone (1992) there is no such thing as acceptable risk, and it should therefore always be avoided. So when handling risk one should evaluate the potential losses, the significance of the losses and the uncertainty of the losses. But we would also argue that risk includes positive opportunities, as shown in various types of decision theory, where the outcomes of actions may have a total expected utility that warrant risky decisions. We would even go further and maintain that not only outcomes but aspects of the activity itself may play a role. In sports, and some other contexts of voluntary risk-taking, or rather risk-seeking, it is the inherent positive feeling of mastery and flow that is of interest (Zuckerman 2007; Nakamura and Csikszentmihalyi 2014). Risk therefore contains negative as well as positive possibilities dependent upon person, situation and context. The new risk-taking scale used in both the earlier study (see Breivik, Sand, and Sookermary 2017) and the present study reflects this dual aspect of risk and risk-taking.

Theoretical alternatives

As argued by Nicholson et al. (2005) there are at least three alternative approaches to the study of risk-taking. We will argue for four. Firstly, there are the expected utility theories like prospect theory (Kahneman and Tversky 1979; Glöckner and Pachur 2012) which proposes that risk-taking is related to a reference point where people will be risk averse if they perceive themselves to be in a position of gain and risk-seeking in a position of loss. This means that risk-taking is dependent upon situational factors and how the reference point and the alternatives are linguistically framed. A second approach puts more weight on individual differences. Framing, and thus risk-taking, can be influenced by personality differences. Willingness to take risks can be more characteristic of an individual than the situation and this may explain findings that contradict prospect theory (Hollenbeck et al. 1994; Zeisberger, Vrecko, and Langer 2012). The optimism and willingness to take risks across different situations that characterize the high sensation seekers (Zuckerman 2007) exemplify the importance of individual differences in personality.

A third approach problematizes a personality-based general approach to risks. Some empirical studies show that the within-individual inter-correlation of risk-taking across different decision areas is weak (Salminen and Heiskanen 1997). But this may vary according to personality types. And as Nicholson et al. (2005) argue, we may find at each end of the risk-taking spectrum people who are consistently risk-seeking or consistently risk averse across situation types (MacCrimmon and Wehrung 1986).

In our own study we suggest a fourth alternative which combines situational and individual factors. The work of Weber, Blais, and Betz (2002) found that while the degree of risk perceived in a situation may vary according to situational characteristics, the risk-taking attitudes remained stable for a considerable amount of people. This is typical for high sensation seekers (Zuckerman 2007). This means that both general attitudes, like Sensation Seeking, and situational and domain-specific factors are operative (Fleeson and Nofhle 2008). According to Fleeson and Nofhle (2008) traits can be better understood as density distributions of behaviors. An individual may have an anchor mean level of a trait, the actual behavior can vary around this mean depending on situation and context.

It is not only general socio-demographic background and personality that may influence risk-taking, but also, according to Sitkin and Pablo (1992), specific past experiences and cognitive inputs. Our study therefore includes past experiences like work experiences and participation in risky sports. Social roles and the cultural 'risk climate' may also play a role in willingness to take risks (Heller, Perunovic, and Reichman 2009). In modern welfare societies, like Norway, risk is generally considered as something to be avoided, if not at all costs, at least in most circumstances. One aim of this study was thus to identify the general risk-climate in the population and its sub-groups.

Earlier studies

Several studies document clear differences in risk-taking related to socio-demographic factors such as *age and gender*. Males are found to be more risk-taking than females across different domains (Byrnes, Miller, and Schafer 1999; Weber, Blais, and Betz 2002; Harris, Jenkins, and Glaser 2006). A consistent finding in these and other studies is that women are as or more willing to take social risks compared to men. Similarly, many studies show that risk-taking declines with age but differently according to content area (Dohmen et al. 2005; Rolison et al. 2013).

With respect to the Norwegian context the research findings follow the international trend. Women and older people are found to be more risk averse than their counterparts (Aarbu and Schroyen 2009; Ulleberg and Rundmo 2002). An exception is a study among Norwegian adolescents ($n = 523$) which found no differences between girls and boys in risk preferences (Almås et al. 2012). The authors explained their findings by the relatively long history of gender equality in Norway.

Several theories, as well as empirical findings, show that risk-taking is influenced by personality factors. In our study we decided to use three different personality tests to try to throw light on risk-taking from three different angles. Firstly, we chose the Eysenck (1976) three-factor model (PEN) because it has identified a risk-taking pattern with some biological underpinnings. Secondly, we chose the Big Five model (McCrae and Costa 1997) as it is the most updated and used model today. And thirdly, we chose Zuckerman's (1994) Sensation Seeking theory which is the most used specific personality model in the study of risk-taking. The three-factor model of personality developed by Eysenck (1976) found that both Extraversion (E) and Psychoticism (P) included elements that could lead to risk-taking. This was also confirmed empirically (Eysenck and Eysenck 1985). Several studies of risk-taking underline the particular importance of Psychoticism (see Idemudia and Sekano 2016). The presently dominant Big Five personality theory similarly includes a factor like novelty seeking which is conceptually related to risk-taking. The empirical study by Nicholson et al. (2005) found a clear Big Five pattern for overall risk propensity; combining high Extraversion and Openness with low Neuroticism, Agreeableness and Conscientiousness. The clearest conceptual association between personality and risk-taking is demonstrated in Zuckerman's Sensation Seeking theory (Zuckerman 1994). Here willingness to take risks is included in the definition of Sensation Seeking. The strong relation between Sensation Seeking and risk-taking is also documented in many empirical studies, as summarized by Zuckerman and Kuhlman (2000) and Zuckerman (2007). The importance of all four Sensation Seeking sub-traits, but especially TAS and ES, is documented in the review of Sensation Seeking in risk sports by Gomà-I-Freixanet, Martha, and Muro (2012) While many studies show that specific groups of risk-takers are found to be high sensation seekers, our goal in the present study was to see if a general positive attitude to different kinds of risk-taking is typical not only for the high sensation seekers, but across the whole spectrum of the scale. The other possibility, as argued by Nicholson et al. (2005), considers that there may be a strong personality-based general attitude at both ends of the risk-taking spectrum but not in the middle of the spectrum where domain-relative attitudes may be more common (see also Herrero et al. 2017).

Central to our study was the use of a new scale with a wider array of risk dimensions. From the research literature it seems that some risk dimensions (often called risk domains) have been far more investigated than others. Furthermore, quite different types and numbers of risk domains have been targeted. Physical risk has been investigated from different perspectives (Yates and Stone 1992; Adams 1995; Zuckerman 2007). Financial or economic risk has also been broadly investigated (e.g. Harrison, Lau, and Rutström 2007; Noussair, Trautmann, and van de Kuilen 2014), whereas less research has been devoted to intellectual risk (e.g. Beghetto 2009; Sjöberg 2005), ethical risk (e.g. Gailliot et al. 2012; Zimmerman, Shalvi, and Bereby-Meyer 2014) and performance-related risk (e.g. Colquitt, Scott, and LePine 2007; Rauch and Frese 2000). Our new scale tries to include these different types of risk-taking into a broader and more comprehensive perspective, which will be presented in the method section.

Table 1. The key variables, their relationships and contents.

Demographics	Personality	Attitudes: Main risk dimensions	Attitudes: Dangerous activities	Behavior: Leisure time	Behavior: Work
Sex Age Education Household income	Big Five EPQ Sensation seeking	Social Intellectual Financial Achievement Political Physical Ethical Existential	Participation in risky sport, Participation in risky type of work, Participation in risky military operations	Participated in risky sports	Work characteristics: Varied Risky Physical

As mentioned earlier we also wanted to see how risk-taking attitudes were manifested in specific areas, such as willingness to participate in risky sports, risky types of work and risky military operations. There are theoretical as well as empirical reasons for looking at how general risk-taking attitudes are associated with attitudes to risky types of sport and work (Zuckerman 2007), as well as military operations (see Sookermy, Sand, and Breivik 2015).

We also wanted to see how risk-taking dimensions were related to work characteristics and so asked the participants in our study to indicate to what extent their work could be characterized as varied, risky and/or physically demanding. The underlying hypothesis was that a general willingness to take risks would be reflected in choice of work (See Zuckerman 2007).

Aims and key variables

Our central aim in this study was to better understand people's general attitudes toward risk-taking, how they are influenced by socio-demographic background and personality and how they are expressed in more specific risk-taking attitudes and behaviors.

The key variables in the project are presented in Table 1. We had the following key questions and hypotheses:

Q1. How are the responses distributed on each of the risk dimensions? Our hypothesis here was that (H1) people are in general risk averse and the distribution of responses will be skewed towards the risk averse part of the scale.

Q2. What is the relation between the risk dimensions and demographic variables? Based on earlier research we expected that (H2) men would be more willing to take risks than women and younger more willing than older people. We had no specific hypotheses concerning the other socio-demographic variables.

Q3. What is the relation between the risk-taking dimensions and personality? Based on intuitions as well as earlier research we expected as our hypothesis (H3) that risk-taking attitudes would be positively correlated with a) Sensation Seeking and its subscales, with b) Extraversion and Psychoticism of the EPQ scale and c) with Extraversion and Openness to new experiences on the Big Five scale.

Q4. What is the relation between the risk dimensions and work characteristics? We expected here that (H4) risk-taking attitudes would be positively correlated with choice of work that is varied, risky and/or physical.

Q5. What is the relation between the risk dimensions and willingness to participate in dangerous activities? We expected that (H5) risk-taking attitudes would be positively related to willingness to be active in risky sport, risky jobs and risky military operations.

Q6. What are the most important predictors of risk-taking? We expected here (H6) that the hypothesized personality traits as well as sex and age would be the most important predictors.

Material and methods

Data were collected by Ipsos Research Institute, a global company with ISO9001 and ISO 202252 certificates. Data were collected during fourteen days in February 2015. The respondents were recruited from the company's own database, which contains all registered telephone numbers in Norway, including cellphones. Numbers were selected on a lottery basis and the interviewers asked for the person in the household, of 15 years or above, whose birthday was next. The size of the database made it possible to draw representative samples related to sex, age and residence. To reach 1,000 complete interviews 22,355 people were contacted with a total of 61,916 calls. Of those contacted 9,567 answered and 12,788 did not. A total of 1,000 respondents then completed the telephone interviews, which lasted approximately eighteen minutes. The response rate from those contacted was four percent and from those who answered ten percent. Even though the response rates should optimally have been higher, a closer inspection found that the sample satisfied criteria for representativity for the selected variables. The final sample scored well. Age was collected in years. For ages 15–24 years the sample reached 82% of the population goal, 25–39 years 109%, 40–49 years 90%, 50–59 years 112%, 60–69 years 110%, and for 70+ years 94%. Although the sample scored well on age and other background variables, we would underline that our use of the expression 'the population' or 'the Norwegian population' in the article must be taken with some caution due to the representativity question.

An overview of the sample characteristics is presented in Table 2. Structured interview guidelines were developed by the authors of this paper in cooperation with representatives from Ipsos MMI, the research company that conducted the telephone interviews. Descriptive data were gathered with respect to socio-demographics, participation in risk sports and attitudes toward eight dimensions of risk-taking.

Central to the study was a new risk-taking scale, based on that developed by Breivik and first used in a study of Everest climbers (Breivik 1997). Internal consistency of the original scale was 0.86 (Breivik 1997). Whereas the 1997 scale explored six risk dimensions, the scale used in the present study comprised eight different risk dimensions. In addition to physical, political, social, economic, intellectual and achievement-related risk we included two new dimensions, which we found interesting and relevant to our study. We included ethical risk-taking which has been used in other population-based studies (Johnson, Wilke, and Weber 2004) and existential risk-taking which has been used in another Norwegian population-based study (Breivik 2017). Ethical risk-taking was included as some forms of risk-taking raise ethical concerns such as military warfare, risky jobs, gambling and risky leisure pursuits – areas we explore in our project. Existential risk-taking was included as it gives a total evaluation of one's choice of life course and is used by philosophers such as Kierkegaard and Nietzsche. Our scale thus comprises a wider set of dimensions than the domain-specific scale (DOSPERT) (Weber, Blais, and Betz 2002), which contains five domains and *The Risk Taking Index* (Nicholson et al. 2005) which uses six.

In the present study the respondents were asked to rate themselves for each dimension on a seven-point scale ranging from a very risk averse to a very risk accepting attitude. The scale

Table 2. Sample characteristics: Range 15–92 years of age, (n = 1000).

Variable	Characteristic	Frequency	Percentage
Gender	Male	525	52.5
	Female	475	47.5
Age	15–24	130	13.0
	25–39	268	26.8
	40–59	331	33.1
	60+	271	27.1
	Education	Realschule	119
	High school	343	34.3
	College/University, lower	319	31.9
	College/University, higher	218	21.8

contained one question for each of the eight risk dimensions, outlining the two opposite alternatives. Short or single-item measurements have their benefits and are a valid measure with respect to subjective issues (e.g. Hoepfner et al. 2011; Robins, Hendin, and Trzesniewski 2001). As argued by Gosling, Rentfrow, and Swann (2003) short scales eliminate item redundancy and reduce fatigue and boredom with longer scales. Such scales are especially useful in large-scale surveys such as ours. Internal consistency (Cronbach's alpha) of the new eight-dimensional scale was 0.70. Since we asked the respondents directly about their dimensional attitude and not indirectly through various items, we think the scale has good substantive validity. The study by Breivik, Sand, and Sookermany (2017) showed that the scale associated well with other measures of risk-taking and thus has acceptable external validity.

The characteristics of the dimensions were defined in the following way:

- *Social risk-taking* – willingness to be different and stand out in social contexts versus being a conformist and under no circumstances standing out.
- *Intellectual risk-taking* – willingness to adopt new, not well-established ideas and solutions versus always holding on to well-established truths.
- *Financial risk-taking* – willingness to invest in uncertain financial projects with a prospect of big returns versus always having money in the bank or in secure investments.
- *Achievement risk* – willingness to set high goals for one's achievements and performances, whether in school, work or sport, versus setting goals that are so low one almost always succeeds in reaching them.
- *Political risk* – willingness to go for big and dramatic changes to create good societies versus making small adjustments and changes to reach secure and stable societies.
- *Physical risk* – willingness to try activities like climbing and skydiving, where severe injury and death may be the result if things go wrong, versus activities that are safe and secure.
- *Ethical risk* – willingness to break ethical rules in various contexts to get what one wants versus always trying to do what is morally correct.
- *Existential risk* – willingness to take big chances in one's life to get what one wants versus going for as much safety and control as possible.

We also computed a *Total Risk* score that summarized the scores on the eight dimensions to give a total or general score. Whereas several scales use 'domain' we prefer 'dimension' because our scale focuses on attitudes toward alternative action possibilities in different dimensions. It focuses less on the characteristics of the different social or environmental domains of human life.

Personality was measured on three different scales. We used a short Norwegian version of the Big Five Inventory, developed and tested by Engvik and Clausen (2011). The scale contains twenty items on a seven-point scale. Cronbach's alpha for the five dimensions varied from 0.78 on Extraversion to 0.57 on Conscientiousness. Sensation Seeking was measured on a scale developed by Hoyle et al. (2002). It contains eight items on a Likert scale, two items for each of the four sub-scales: Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (Dis), Boredom Susceptibility (BS). The internal consistency (Cronbach's alpha coefficient) of the original eight-item scale was 0.76. In the Norwegian version internal consistency was 0.74. A short version of Eysenck's Personality Questionnaire (EPQR-A) was also used (Francis, Brown, and Philipchalk 1992). The questionnaire contains six items on a five-point Likert scale, two items for each of the three personality traits: Extraversion, Psychoticism, Neuroticism. Alpha scores were Extraversion 0.62, Psychoticism 0.55, Neuroticism 0.55. The alpha scores for all three short scales are considered acceptable (see Engvik and Clausen 2011; Gosling, Rentfrow, and Swann 2003).

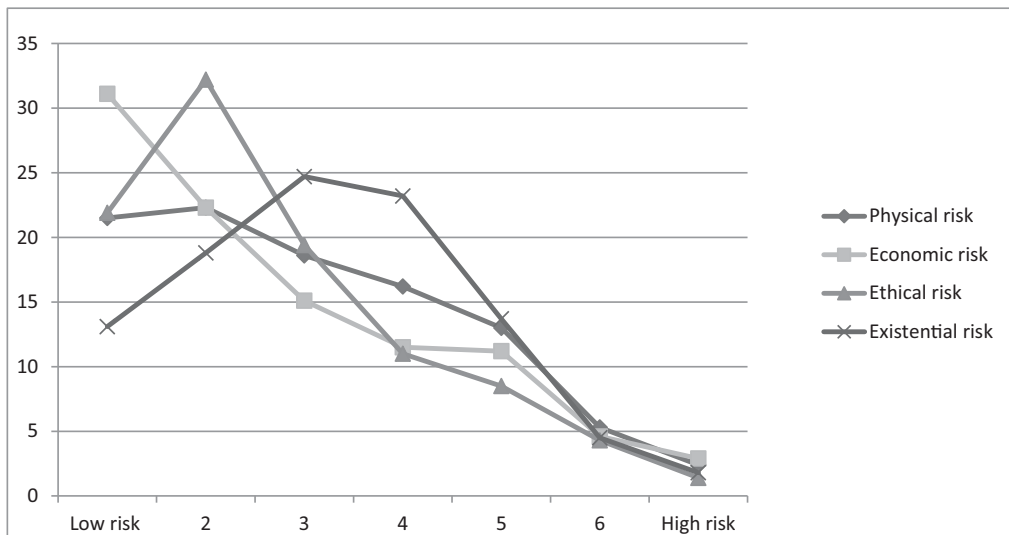


Figure 1. The distribution of scores on physical, economic, ethical and existential risk-taking. $N = 1000$.

Results

The results are presented in accordance with the key research questions mentioned above.

Q1. How are the responses distributed on each of the risk dimensions?

As presented in Figures 1 and 2 the eight risk dimensions show two different score patterns. Social risk, intellectual risk, achievement risk and political risk were almost normally distributed with respect to responses, i.e. Norwegians can be considered to have a 'risk neutral' profile in these four dimensions. Economic risk, physical risk, ethical risk and existential risk showed a different pattern with an almost linear decline from the risk averse to the risk accepting end of the scale. Norwegians have a 'risk averse' profile in these dimensions.

The results also revealed that the proportion of Norwegians who could be considered as 'risk accepting' was relatively small for most of the eight risk dimensions. The proportions scoring six or seven on the seven-point Likert scale were <10% for ethical risk (5.7%), existential risk (7.3%), economic risk (7.5%) and physical risk (7.7%). Achievement risk (17.2%) followed by intellectual risk (16.4%) were the dimensions with the highest share of 'risk accepting' people.

As detailed in an article by Breivik, Sand, and Sookermany (2017) from the same project (LuR) there were significant ($p \leq 0.01$) positive correlations between all of the eight risk dimensions, except for ethical risk vs. achievement risk ($p < 0.05$). The significant correlations were moderate, ranging from .086* to .444*. This supports the idea that risk-taking attitudes are positively correlated, but with considerable variations between dimensions.

Q2. What is the relation between the risk dimensions and the demographic variables?

Age and gender

An ANOVA analysis showed that males scored significantly higher than females on six of the eight dimensions: highest on physical risk ($F(1,998) = 48.62$, $p \leq .01$, $\eta^2 = .046$) and economic risk ($F(1,998) = 56.77$, $p \leq .01$, $\eta^2 = .054$) followed by achievement risk ($F(1,998) = 18.86$, $p \leq .01$, $\eta^2 = .019$), ethical risk, ($F(1,998) = 8.21$, $p \leq .01$, $\eta^2 = .008$), existential risk ($F(1,998) = 5.30$, $p \leq .05$, $\eta^2 = .005$) and intellectual risk ($F(1,998) = 4.79$, $p \leq .05$, $\eta^2 = .029$). Consequently there was a clear

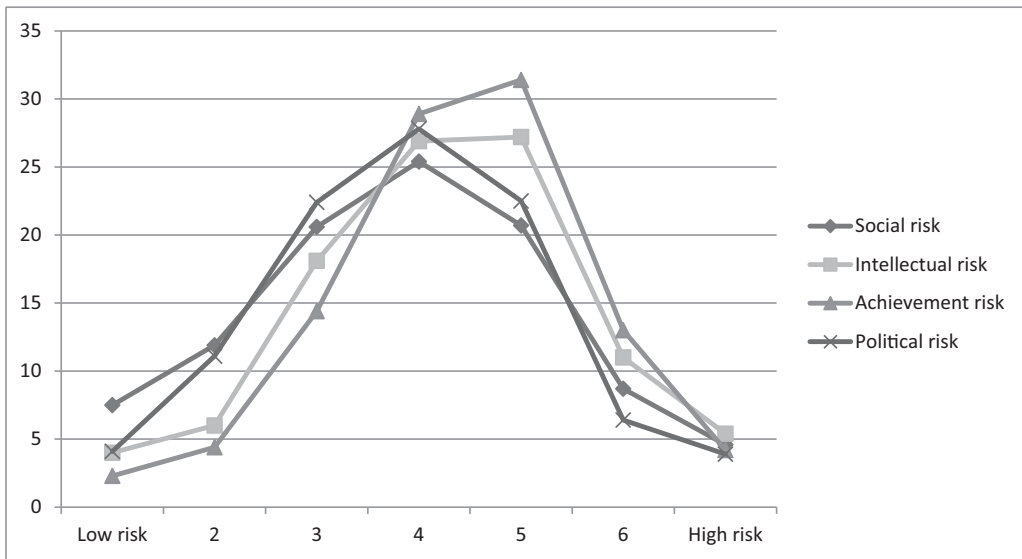


Figure 2. The distribution of scores on social, intellectual, achievement-related and political risk-taking. $N = 1000$.

difference on the Total risk score ($F(1,956) = 44.74$, $p \leq .01$, $\eta^2 = .045$). Men were more willing to take risks than women.

An ANOVA analysis revealed significant differences in relation to age on all risk dimensions. The differences were biggest between age groups on physical risk ($F(3,996) = 49.48$, $p \leq .01$, $\eta^2 = .130$) and existential risk ($F(3,996) = 36.96$, $p \leq .01$, $\eta^2 = .100$) followed by economic risk ($F(3,996) = 13.69$, $p \leq .01$, $\eta^2 = .040$), achievement risk ($F(3,996) = 11.63$, $p \leq .01$, $\eta^2 = .034$), ethical risk ($F(3,996) = 10.44$, $p \leq .01$, $\eta^2 = .030$), social risk ($F(3,996) = 8.49$, $p \leq .01$, $\eta^2 = .025$), political risk ($F(3,996) = 3.56$, $p \leq .05$, $\eta^2 = .011$) and intellectual risk ($F(3,996) = 3.02$, $p \leq .05$, $\eta^2 = .009$). Total risk was also significant ($F = 29.29$, $p \leq .01$). On all dimensions younger groups were more willing to take risks than older. The effect sizes were medium to low on sex differences but large to medium or small on age differences. A two-way MANOVA revealed no interactional effect for gender and age, however there were significant main effects for both gender ($F(8, 926) = 15.324$, $p \leq .01$; Wilk's $\Lambda = 0.883$, partial $\eta^2 = .117$) and age ($F(16, 1852) = 13.576$, $p \leq .01$; Wilk's $\Lambda = 0.801$, partial $\eta^2 = .105$).

Education and income

An ANOVA analysis showed that the mother's education influenced in a significant way willingness to take on all eight dimensions: physical risk ($F(4,995) = 18.84$, $p \leq .01$, $\eta^2 = .070$), existential risk ($F(4,995) = 14.88$, $p \leq .01$, $\eta^2 = .056$), achievement risk ($F(4,995) = 6.55$, $p \leq .01$, $\eta^2 = .026$), economic risk ($F(4,995) = 6.14$, $p \leq .01$, $\eta^2 = .024$), social risk ($F(4,995) = 5.64$, $p \leq .01$, $\eta^2 = .022$), ethical risk ($F(4,995) = 5.41$, $p \leq .01$, $\eta^2 = .022$), political risk ($F(4,995) = 4.33$, $p \leq .01$, $\eta^2 = .017$), intellectual risk ($F(4,995) = 2.92$, $p \leq .05$, $\eta^2 = .012$) and Total risk ($F(4,995) = 11.37$, $p \leq .01$, $\eta^2 = .046$).

The father's education was significant in relation to five dimensions: physical risk ($F(4,995) = 8.81$, $p \leq .01$, $\eta^2 = .034$), existential risk ($F(4,995) = 5.59$, $p \leq .01$, $\eta^2 = .022$), economic risk ($F(4,995) = 4.86$, $p \leq .01$, $\eta^2 = .019$), social risk ($F(4,995) = 4.79$, $p \leq .01$, $\eta^2 = .019$) and achievement risk ($F(4,995) = 3.29$, $p \leq .05$, $\eta^2 = .013$). On Total risk the score was ($F(4,995) = 4.48$, $p \leq .01$, $\eta^2 = .018$).

In relation to own education we selected the age group 28–67 years, to ensure that education was finished. An ANOVA analysis revealed significant differences with higher risk scores for higher educational levels on five dimensions: existential risk ($F(3,675) = 12.87$, $p \leq .01$, $\eta^2 = .054$),

achievement risk ($F(3,675)=7.53, p \leq .01, \eta^2=.032$), physical risk ($F(3,675)=5.53, p \leq .01, \eta^2=.024$), social risk ($F(3,675)=4.41, p \leq .01, \eta^2=.019$) and intellectual risk ($F(3,675)=4.39, p \leq .01, \eta^2=.019$). The effect sizes were medium to low on all education-related variables.

In relation to household income in the 28–67 age group, differences were significant in relation to achievement risk ($F(2,624) = 16.68, p \leq .01, \eta^2 = .051$), economic risk ($F(2,624) = 3.84, p \leq .05, \eta^2 = .022$) and existential risk ($F(2,624) = 3.56, p \leq .05, \eta^2 = .011$). The group with highest household income was most willing to take risks.

Q3. What is the relation between the risk-taking dimensions and personality?

Personality was measured on three different scales. A bi-variate correlation analysis was performed between the personality scales and the risk-taking dimensions. The results are presented in Table 3. The results on the relation between the Sensation Seeking scores and the risk dimensions were published earlier in both a slightly different way and theoretical context in the article by Breivik, Sand, and Sookermary (2017). The results are also presented here to give the full picture of the association between all three personality scales versus the risk-taking dimensions.

All the Sensation Seeking sub-factors correlated positively with each of the eight risk dimensions and the Total risk score. On the Eysenck’s scale Extraversion correlated positively with all risk dimensions except economic risk and ethical risk. Psychoticism correlated positively with all risk dimensions including Total risk. Neuroticism had weak negative but non-significant correlations with all risk dimensions, except ethical risk where the negative correlation was significant. On the Big Five Inventory Extraversion showed the same correlation pattern as Eysenck’s Extraversion dimension, except on physical risk where Eysenck’s scale had a significant positive correlation; but the Big Five did not. Agreeableness showed negative correlations with economic risk, physical risk, ethical risk and Total risk, and a positive correlation with intellectual risk. Conscientiousness showed significant negative correlations with all risk dimensions, except physical risk. Stableness showed positive correlations with all risk dimensions except ethical risk. Openness correlated positively with all risk dimensions.

Q4. What is the relation between the risk dimensions and work characteristics?

We asked the respondents to rate their work according to whether their workplace was characterized by: routines and predictability versus variation and unpredictability; physical security and safety versus physical uncertainty and risk; and lastly, physically demanding versus not physically demanding at all. The findings are presented in Table 4.

Table 3. Correlations between the personality scales Sensation Seeking, Big Five Inventory, EPQR-A and the eight risk dimensions.

	Social	Intellect	Economic	Achieve	Political	Physical	Ethical	Existential	Total
TAS	.212**	.221**	.224**	.188**	.165**	.569**	.189**	.367**	.340**
ES	.175**	.229**	.069*	.100**	.147**	.278**	.107**	.226**	.161**
Dis	.180**	.173**	.252**	.149**	.136**	.407**	.315**	.353**	.404**
BS	.145**	.143**	.098**	.127**	.144**	.249**	.152**	.206**	.205**
SSS	.246**	.262**	.226**	.197**	.204**	.527**	.263**	.400**	.388**
Extra	.432**	.168**	.048	.133**	.146**	.126**	-.019	.160**	.092**
Psych	.089**	.128**	.167**	.081**	.091**	.139**	.235**	.165**	.274**
Neur	-.036	-.032	.022	-.051	-.019	-.013	-.085**	.021	.034
Extravert	.329**	.124*	-.005	.083*	.108*	.040	-.054	.074**	.066*
Agreeable	.032	.074*	-.100**	.024	.054	-.089**	-.152**	-.044	-.104**
Conscient	-.091**	-.071**	-.147**	-.063*	-.110**	-.260	-.161**	-.108**	-.199**
Stable	.097**	.181**	.090**	.149**	.125**	.122**	.017	.152**	.140**
Open	.229**	.367**	.084**	.246**	.233**	.225**	.165**	.338**	.281**

* $p \leq 0.05$,
** $p \leq 0.01$.

The respondents rated their workplace on a scale from 1 to 7 where one meant low variation, low risk, low physical effort and seven meant very high. In relation to variation the mean score was 5.17 and median 5 on the seven-point scale. Scores were almost normally distributed. In relation to risk the mean score was 2.70 and median 2 and the distribution strongly skewed toward the risk averse end. In relation to physically demanding work the mean score was 3.35 and the median 3, which means a distribution skewed toward not physically demanding work.

A bivariate correlation analysis was performed between workplace characteristics and risk dimensions. Variation and unpredictability correlated positively with all risk dimensions, except ethical risk. Workplaces with risk and uncertainty correlated positively with all risk dimensions except achievement risk and political risk. Workplaces with physically hard work correlated positively with physical risk, existential risk and Total risk. Correspondingly, there were significant positive correlations ($p \leq 0.01$) between all three workplace characteristics (varied vs. risky; varied vs. physically demanding; risky vs. physically demanding).

Q5. What is the relation between risk dimensions and participation in dangerous activities?

We also asked the respondents about their participation in and attitudes toward various risky activities. Firstly, we asked: 'Have you ever participated in activities or sports where one has a risk of serious injury or death, such as climbing, sky diving, steep downhill skiing or such like?' Of the total sample 21.2% answered 'yes'. As many as 26.3% of the males had participated in such activities and 15.5% of the females. Those below the age of 40 had been much more involved than those over 40. Respondents who had participated in risky activities scored significantly higher than those who had not on all the risk dimensions, including Total risk ($F(1,956) = 53.24, p \leq 0.01, \eta^2 = .053$).

Secondly, we asked the respondents whether they could imagine: 1) 'being active in risky sports or extreme sports that involved danger'; 2) 'having a job that included dangerous missions, such as being a member of special groups in firefighting, police or rescue operations'; and 3) 'taking part in dangerous military operations abroad.' All three questions included the precondition 'if you were in good shape and of the right age.'

The overall answers and distributions across gender and age groups are presented in [Table 5](#) and show two patterns: men are more willing than women to participate in such activities and

Table 4. Correlations between work characteristics and risk-taking dimensions. ($n = 763$).

	Social	Intellect	Economic	Achieve	Political	Physical	Ethical	Existent	Total
Varied	.165**	.164**	.082*	.128**	.106**	.104**	-.016	.187**	.102**
Risky	.074*	.144*	.110*	.050	.068	.156**	.065	.153**	.365**
Physical	.025	.035	.011	.048	.042	.080*	.066	.116**	.300**

* $p \leq 0.05$,

** $p \leq 0.01$.

Table 5. Willingness to participate in risky sports, risky jobs and risky military operations, dependent upon right age and fitness: Percentages ($n = 1,000$).

	Risk Sport		Risk Job		Military operation	
	Yes	No	Yes	No	Yes	No
In all	36.4	63.6	56.1	43.9	25.6	74.4
Males	43.8	56.2	65.8	34.2	37.3	62.7
Females	28.1	71.9	45.5	54.5	12.9	87.1
15-24	69.0	31.0	70.9	29.1	35.5	64.5
25-39	45.6	54.4	61.2	38.8	28.0	72.0
40-59	31.1	68.9	56.3	43.7	24.6	75.4
60+	18.3	81.7	44.0	56.0	19.9	80.1

increasing age indicates less enthusiasm. The correlation between risk sports and special groups in firefighting, police or rescue operations was .311 ($p \leq .01$), between risk sports and military operations .174 ($p \leq .01$) and between military operations and special groups .286 ($p \leq .01$).

Three one-way MANOVAs were conducted with respectively ‘risk sport’, ‘risk job’ and ‘military operation’ as independent variables. The eight risk dimensions were dependent variables in all three analyses. Willingness to participate in risk sports showed a strong main effect ($F(8, 914) = 68.640, p \leq .01$; Wilk’s $\Lambda = 0.625$, partial $\eta^2 = .375$) as well as willingness to take risk jobs ($F(8, 911) = 16.904, p \leq .01$; Wilk’s $\Lambda = 0.871$, partial $\eta^2 = .129$) and willingness to participate in military operations ($F(8, 906) = 18.812, p \leq .01$; Wilk’s $\Lambda = 0.858$, partial $\eta^2 = .142$). Those indicating positive answers scored significantly higher than their counterparts on all eight risk dimensions. We previously found that women and older age groups are less willing to take risk in all dimensions (Sand, Breivik, and Sookermary 2018) and thus three additional MANCOVAs with age and gender as covariates were carried out. Small moderating effects were revealed in all three analyses; however, the significant results between those willing and unwilling were maintained for all eight dimensions.

Q6. What are the most important predictors of risk-taking?

To find out more about the predictive value of socio-demographics and personality characteristics in relation to risk-taking we performed a logistic regression with a cut-off between the 25% highest scores on total risk-taking and the rest. Personality variables were dichotomized similarly with the top 25% scorers as cut-off point. The rationale was based on an examination of the distribution of

Table 6. A logistic regression model. The twenty-five percent highest scorers on Total risk-taking versus the rest.

		B	SE	Wald	df	Sig.	OR	95% CI for OR	
								Lower	Upper
Gender	Female								
	Male	.675	.242	7.767	1	.005	1.964	1.222	3.156
Age	15–24								
	25–39	.210	.401	.275	1	.600	1.234	.562	2.708
	40–59	-.081	.422	.037	1	.847	.922	.404	2.106
	≥60	-.691	.462	2.236	1	.135	.501	.202	1.240
Education	Primary school								
	Vocational/High School	-.101	.515	.038	1	.845	.904	.330	2.479
	College/University, Lower	.245	.513	.228	1	.633	1.278	.467	3.492
	College/University, Higher	.417	.523	.636	1	.425	1.518	.544	4.233
Household income	<600.000 NOK								
	600.000–1.000.000 NOK	-.076	.273	.078	1	.780	.927	.542	1.583
	>1.000.000 NOK	.123	.277	.198	1	.657	1.131	.658	1.945
Sensation seeking	Low/Medium								
	High	1.227	.232	27.998	1	.000	3.412	2.166	5.375
Extraversion	Low/Medium								
	High	.582	.261	4.953	1	.026	1.789	1.072	2.985
Agreeableness	Low/Medium								
	High	-.198	.269	.542	1	.462	.821	.485	1.389
Conscientiousness	Low/Medium								
	High	-.392	.311	1.581	1	.209	.676	.367	1.245
Stable	Low/Medium								
	High	.263	.240	1.207	1	.272	1.301	.814	2.081
Openness	Low/Medium								
	High	.523	.237	4.850	1	.028	1.687	1.059	2.686
Extraversion	Low/Medium								
	High	.586	.244	5.783	1	.016	1.796	1.114	2.895
Psychoticism	Low/Medium								
	High	.851	.255	11.127	1	.001	2.342	1.420	3.861
Neuroticism	Low/Medium								
	High	-.292	.289	1.021	1	.312	.746	.423	1.316

responses on the eight risk-taking dimensions, as well as the finding that more than 20% of the population had participated in risky activities and sports. The results are summarized in [Table 6](#).

The logistic regression model was statistically significant ($\chi^2(18) = 149.553$, $p \leq .01$) and correctly classified 83.5% of the cases. The model revealed that being male ($p \leq .01$) and scoring high on Sensation Seeking ($p \leq .01$) predicted high willingness to take risks across different dimensions. According to [Table 6](#) men were almost twice as likely as women to be high scorers on Total risk-taking (OR 1.964 [95% CI: 1.222–3.156]), whereas high sensation seekers were almost three and a half times more likely than their counterparts to be high scorers when controlling for socio-demographic and personality variables. Furthermore, high scores on the Big Five sub-scales Extraversion ($p \leq .05$) and Fantasy ($p \leq .05$), as well as the Eysenck EPQ sub-scales Extraversion ($p \leq .05$) and Psychoticism ($p \leq .01$) predicted high willingness to take risks. The most distinct result among the personality sub-scales was found for Psychoticism where those scoring high were more than twice as likely to have high scores on Total risk-taking than their counterparts (OR 2.342 [95% CI: 1.420–3.861]).

Discussion

The risk dimensions

Our first main finding is that the risk-taking dimensions show different distribution curves. We found two main patterns. People are risk averse in relation to physical risk, economic risk, ethical risk and existential risk. There is a semi-linear decrease in the number of people who accept risk in these dimensions. We think this can be explained by the seriousness of negative outcomes. People do not accept taking chances with their physical well-being, their money, their ethical conscience and the course of their lives. For most people risk in these areas is something that should be avoided.

But interestingly in relation to social, intellectual, political and achievement dimensions the distribution of responses follow a bell-shaped pattern indicating that most people want neither too little nor too much risk. Life must not be too dull, yet not too dangerous either. In these areas more people are willing to go to the most extreme risk accepting scores. Around 17% of the population accepted the highest points on the scale in relation to achievement risk and intellectual risk. Our hypothesis (H1) was only partially confirmed. People were not in general risk-averse, but only on those dimensions that were threatening to the most vulnerable parts of people's lives such as physical risk, existential risk, economic risk and ethical risk.

A second finding is that all the risk-taking dimensions were positively correlated except achievement risk and ethical risk, which supports the idea of risk-taking as a general attitude across different dimensions or domains. On the other hand, the correlations are medium to weak, indicating some specificity and inter-individual and intra-individual variation. The strongest correlation was between physical risk and existential risk (.444, $p \leq .01$). People who want to take chances in their lives also seem to be willing to 'live dangerously', as Nietzsche said, and thus to willing risk their lives physically. And conversely, few physical risks are associated with living a prudent life with few existential risks. Due to the medium to low correlations we think our findings give support to the interaction or synthesis model of the personality x situation interaction. On one hand people often choose situations that reflect their personalities (Funder 2010), but there are considerable fluctuations around a norm in actual situational behavior (Fleeson and Nofle 2008).

The socio-demographics of risk-taking

Several previous studies of different samples have shown that males are more risk-taking than females. In a meta-analysis of 150 studies Byrnes, Miller, and Schafer (1999) found that in 14 out

of 16 types of risk-taking, males were more risk-taking than females. Similarly, Weber, Blais, and Betz (2002) found women to be more risk averse than men in all domains except social risk. In one of the few population-based studies, a German study comprising more than 22,000 individuals, Dohmen et al. (2005) found that women were more risk averse than men. In our study males scored higher than females on six out of eight dimensions. The differences were biggest on physical risk and economic risk, dimensions with serious negative consequences. Our hypothesis (H2) was thus supported for gender on all except two dimensions. There were no significant differences on social risk and political risk. In social arenas women seem to be on a par with men. This may also reflect the egalitarian culture of Norwegian society where the Prime Minister, many leading politicians and media people are women.

The difference between males and females may be the result of different gender roles where in most societies, including the Western, males have had a 'risk role' and women a 'safety role'. This gender gap seems in many areas to have become smaller. Women increasingly enter male arenas in sport, leisure, the job market and in military forces. Nevertheless, some differences in attitudes and behaviors persist, such as those toward risks. Some think that there may be evolutionary and biological underpinnings that, even in the future, make it unlikely to see the gender gap in relation to risks disappear completely (Geary 2010). The overview of research by Chauvin (2018) presents a more culturally based perspective. White men tend, in general, to judge risks as smaller and less problematic than women and non-white men. Among the possible explanations one has pointed to (1) men being in an advantageous position in terms of power and control over risks and (2) men selecting risk information that supports one's cultural orientation. According to Chauvin's (2018) findings cultural worldviews play an important role in shaping individual risk perceptions. Individuals tend to form risk perceptions that accord with value characteristics of groups to which they identify (see Chauvin 2018, p.37).

Our study revealed a clear age-related decline in willingness to take risks in all eight dimensions. This is in accordance with the age part of our hypothesis (H2). There was no interaction effect between sex and age. The differences between young and old were biggest on physical risk and existential risk and smallest on intellectual risk and political risk. A similar decline in willingness to take risks was also found in the population-based German study. Our study confirmed only to a certain extent the findings of Rolison et al. (2013) whereby as social risk increased from young to middle age, ethical risk-taking and health risk-taking reduced relatively smoothly with age. The decline in risk-taking with increasing age may be seen as a prudent strategy since the challenges posed by risks demand coping capabilities that decline with age. On the other hand, increased experience among older people can compensate to a certain degree, however older age often means more conservative choices. Nousseir, Trautmann, and van de Kuilen (2014) found that in a large demographically representative sample of 3,457 participants from the Netherlands the majority of individuals' financial decisions were consistent with risk aversion, prudence and temperance. This may be especially true for older people and not only in relation to financial decisions.

In addition to being male and young, social class matters in relation to risk-taking. According to some stereotypes one could imagine that a coming from a working-class background and working in a low-income manual job would predispose for risk-taking. We found this not to be the case. Both mother's and father's educational level influenced willingness to take risks. Increasing educational levels associated positively with willingness to take risks: mother's educational level on all risk dimensions and father's on six out of eight. Correlations were strongest for physical risk and existential risk. Well-educated parents may be generally more tolerant or show more supportive attitudes toward their children when they engage in risky activities or choose risky life courses than less educated parents. In addition, a person's own educational level matters. The higher a person's education, the more willing that person is to take risks in five out of eight dimensions, with strongest associations in relation to existential risk, achievement-related risk and physical risk. Highly educated people are more positive toward a risky life course, risky

physical arenas and competitive arenas in general. Household income associated positively with achievement risk, economic risk and existential risk. This means that social class, defined by educational level in the family and household income, has a positive influence on willingness to take risks in several dimensions, especially existential risk, physical risk, achievement risk and economic risk.

Our findings support the population study of Dohmen et al. (2005) which found that risk-taking was positively associated with parental educational level. Similarly, Donkers, Melenberg, and Soest (2001) found that income and education level were positively related to an individual's attitude toward financial risk. Likewise, Hartog, Ferrer-I-Carbonell, and Jonker (2002) concluded that increased income reduced risk aversion and the same was true for wealth. Our study shows in a more nuanced and fine-grained way how education in a family and household income influence risk-taking in the various dimensions. In general, it seems that families with educational and economic resources have capabilities to handle risks and to take losses, which makes them more active and positive toward challenges posed by positive as well as negative outcomes of risk-taking.

Personality and risk-taking

According to Zuckerman's theory, "Sensation Seeking is a trait defined by the seeking of varied, novel, complex, and intense situations and experiences, and the willingness to take physical, social, and financial risks for the sake of such experience (1994, p.27)." Our results revealed that the positive relation between Sensation Seeking and risk-taking was not confined to the areas mentioned in the definition, but to all the eight dimensions that we measured. And furthermore, all sub-scales correlated positively, albeit moderately to low, with all risk-taking dimensions. Our hypothesis (H3) concerning Sensation Seeking and risk-taking was thus confirmed. In addition, our findings support the idea of a certain generality in attitude toward various forms of risk-taking where all sub-factors of Sensation Seeking are involved. As expected the strongest correlation was between TAS and physical risk-taking, which may be due to a certain similarity among items that measure these two factors. Since the total Sensation Seeking score also had a strong positive correlation with physical risk it may be that serious consequences of physical risk are good markers or tests of general Sensation Seeking attitudes.

In relation to Eysenck's theory, Sensation Seeking was first placed as a sub-factor of Extraversion, but Zuckerman (1994) later argued that it should be situated between Extraversion and Psychoticism. This fits well with Eysenck's theory and the studies showing that risk-taking was positively correlated with both Extraversion and Psychoticism (Eysenck and Eysenck 1985). It was the impulsivity more than the sociability aspect of Extraversion that was relevant in relation to Sensation Seeking as well as risk-taking. Furthermore, the mental toughness and drive connected with the P-factor resonated positively with Sensation Seeking, especially Thrill and Adventure Seeking (TAS) and Experience Seeking (ES). Our findings showed modest but positive correlations between Extraversion and the majority of risk-taking dimensions, as well as between Psychoticism and most risk-taking dimensions. Our hypothesis (H3) concerning Eysenck's scale thus received support in relation to most risk-taking dimensions. Psychoticism had a somewhat stronger positive pattern in relation to risk-taking, especially to the Total risk score. This supports the theory that Psychoticism is more relevant than Extraversion to understanding risk-taking.

In relation to the Big Five our findings supported our hypothesis (H3) which stated that risk-taking would be associated with elevated scores on Extraversion and Openness to new experience. In addition, we found results on the other sub-scales of the Big Five that fit well with the pattern found by Nicholson et al. (2005). This pattern means that risk-taking correlates positively with Extraversion and Openness and negatively with Neuroticism, Agreeableness, and Conscientiousness. We found the same general pattern but with varying numbers of significant

correlations on each of the dimensions. On the Neuroticism scale we used the positive end, Stableness, instead of the negative end, Neuroticism. Extraversion of EPQ and the Big Five had very similar patterns in relation to the various risk dimensions, except the Big Five Extraversion did not correlate positively with physical risk-taking. The impulsivity dimension of EPQ Extraversion may account for the positive physical risk-taking relation. It is of interest that Stableness correlates positively with all risk-taking dimensions, except ethical risk. In taking risks there are obviously some advantages in having a stable personality and thus not only having the nerve to do risky things but being able to keep a cool head. In general, our findings are in accordance with the summary of research on personality and risk-taking by Lauriola and Weller (2018). They conclude that Sensation Seeking is strongly associated with recreational and social risks that trigger emotional arousal. Impulsivity, which is part of Extraversion as well as Sensation Seeking traits, is associated with ethical, health safety and financial risk-taking, due to a disregard of future consequences and lack of self-control. Among the Big Five, Extraversion and Openness to experience are associated with risk-taking whereas Conscientiousness and Agreeableness are linked to risk aversion. Neuroticism aspects such as worry and anxiety have negative associations with risk-taking. They further argue that risk-taking is not a uni-dimensional trait but is the result of an interplay of several personality traits. In general, positive emotionality traits promote risky behaviors that are emotionally rewarding, while negative emotionality traits lead to heightened perceptions of danger and risk avoidance (see Lauriola and Weller 2018 p. 3).

Work characteristics and risk-taking

Our hypothesis (H4) predicted that risk-taking attitudes would be positively correlated with a choice of work that is varied, risky and/or physical. Our findings gave partial support to the hypothesis. Varied work correlated positively with seven risk dimensions, risky work with six dimensions and physical work with two. In general, the highest correlations between type of work and risk-taking attitudes were found in relation to physical risk and existential risk. There was a strong to moderate correlation between workplaces that were varied, risky and physically demanding. The findings give support to the interaction model of the person x situation model (Fleeson and Nofhle 2008). Several empirical studies indicate that people tend to choose types of work that, to some extent, match their personalities (Zuckerman 2007). Choice of work is dependent upon many different interests and many constraints. There seems nevertheless to be a tendency, albeit weak, for people to end up in work types that correspond to their risk preferences.

Participation in risky activities

Norway is a modern welfare society with a strong focus on safety in all areas of life. Slogans like 'zero tolerance for accidents' and '24 hours safety' signal a strong risk averse attitude among politicians, in the state bureaucracies, in the private sector, in education and so on. One of the few arenas where people can take risks is sports and leisure. Since the 1970s when the new action sports, lifestyle sports, adventure sports, extreme sports started to develop and spread, many new arenas for voluntary risk-taking have appeared (Breivik 2007; 2010). It was nevertheless surprising that as many as 21.2% of the population had participated in activities with risk of serious injury or death. It was as expected that more men (26.3%) than women (15.5%) had participated. Younger respondents had been more involved than older, which we think shows the richer abundance of risk arenas that have been developed during the last decades. Those who had participated in risky sports scored significantly higher than those who had not on all risk dimensions. The first part of our hypothesis (H5) was thus confirmed.

An even higher number of the population was willing, given the right age and fitness level, to participate in risky jobs, risky sports or risky military operations. Most attractive were risky prosocial

jobs like firefighter, police or rescue worker, where as many as 56.1% of the population were willing, followed by risky sport 36.4% and military operations 25.6%. The differences between men and women and between age groups showed the same pattern for all three activity types.

The statistical analyses showed that those who were willing to engage in risky sport, risky prosocial work and risky military operations scored significantly higher than their counterparts on all risk-taking dimensions. The second part of our hypothesis (H5) was thus confirmed.

The results may indicate that people are not satisfied with too much safety and that, contrary to safety ideology, risky pursuits are attractive. This may, to some extent, support Elias and Dunning (1986) compensation hypothesis which suggests that thrilling and risky activities like sports represent a *quest for excitement in unexciting societies* (see also Breivik 2007). But it is of interest that the normatively seen most positive activities, like different types prosocial work, scored highest.

When we compared socio-demographic factors and personality characteristics in relation to Total risk-taking, a regression analysis showed that both being male and having specific personality traits were most important. It is the extraverted, imaginative and aggressive male high sensation seekers that are the typical high-scoring risk-takers. In many ways this is in line with some stereotypical models of male risk-takers as found in the review of literature in Zuckerman's (2007) study of risk-taking. Our hypothesis (H6) was thus supported.

Some conclusions and implications

We will argue that the study presented in this article is unique in several ways. Firstly, it is based on a representative sample of the adult population in a nation. Secondly, it uses a more nuanced instrument and a broader array of risk dimensions than other studies to identify the risk profile of the population. Thirdly, it gives a more encompassing view of how risk-taking attitudes are related to socio-demographic as well as personality factors. It thus gives a more comprehensive and inclusive understanding of how together different factors contribute to various risk-taking attitudes.

The study used a more fine-grained instrument than in earlier studies, identifying altogether eight different risk dimensions. We found that risk-taking has some generality across the different dimensions and identified two main patterns. People are in general risk averse in relation to physical, ethical, economic and existential risks but had a balanced bell-shaped distribution of scores on the other risk dimensions. We found a clear socio-demographic score pattern in relation to risk-taking. With some variations, males were more willing to take risks than females, younger more willing than older, and those with high education and income levels were more willing than those with low levels. Similarly, the personality scales provided us with a relatively clear picture of the risk-taking personality. Risk-taking was positively associated with all Sensation Seeking sub-scales and with Extraversion and Psychoticism on Eysenck's EPQ. On the Big Five dimensions risk-taking correlated positively with Extraversion, Stableness and Openness, and negatively with Agreeableness and Conscientiousness. A logistic regression model, identifying the 25% highest scorers on Total risk-taking, found that being male and scoring high on Sensation Seeking were the most important predictors. Furthermore, high scores on the Big Five sub-scales Extraversion and Openness, as well as the Eysenck EPQ sub-scales Extraversion and Psychoticism predicted high willingness to take risks.

Finally, the study found that a higher proportion than expected, in total as many as 21.2% of the population, had participated in activities with risk of serious injury or death. More than half of the population was willing, given the right age and fitness level, to take part in prosocial jobs like firefighter, police or rescue worker (56.1%), followed by risky sport (36.4%) and military operations (25.6%). This stands in contrast to the idea of the secure and risk-averse modern welfare society.

Our findings in this study may have several implications. We will point to two. Firstly, it has helped to present a more comprehensive picture of the risk-taker, including socio-demographic background, personality profile and risky work and leisure behaviors. This picture may be more valid than some earlier studies have indicated since it is based on a representative sample of the population. Secondly the study has shown that people are not as risk averse as many authors seem to presuppose. This may influence how we should set up education programs and provide outdoor leisure arenas for those who look for more excitement in the present unexciting societies.

Yet the study has some limitations. The interview format limited the number of questions. More comprehensive and detailed versions of the instruments we used are needed to corroborate our findings. Similarly, it is hard to get a representative sample of the population. New studies with even higher numbers of respondents and from different countries should be welcomed.

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