

## Personality and Risk Taking

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### Abstract

There is a long-standing and persistent belief that risk-taking is a stable personality trait, often referred to as risk attitude or risk preference. This belief implies that a given individual will take similar risks across a range of situations. The article reviews different definitions of risk attitude that show cross-situational consistency to varying degrees. Additionally, several important person-related and situation-related factors affecting risk-taking and its underlying mechanisms are reviewed, including risk perception, risk-value tradeoffs, affective and deliberative processes, and emotion regulation.

There is a long-standing and persistent belief that risk-taking is a stable personality trait, often referred to as risk attitude or risk preference. The belief implies that a given individual will take similar risks across a range of situations and that some people will be more risk-averse (or more risk-seeking) across situations than others. The article reviews different definitions of risk attitude that show cross-situational consistency to varying degrees and highlights several factors related to individual differences that are known to affect risk-taking. Section ‘[Domain and Framing Effects on Risk-Taking](#)’ shows that risk attitude defined within the expected utility (EU) framework varies greatly across situations as a function of decision content and outcome framing. Section ‘[Risk-Taking and Risk Perception](#)’ describes a more promising conceptualization of risk-taking, within a risk-value framework. It models risk-taking as a function of (1) decision-makers’ perception of the riskiness and value or return of different courses of action, and (2) their attitude toward perceived risk (PRA), i.e., their willingness to trade off (perceived) risk for return. Two individuals might differ in their recreational pursuits, for example, either because they assess the relative risks of skydiving, bungee jumping, and playing poker very differently (based on past experience, person A may perceive playing poker to be riskier than skydiving and thus choose to go skydiving out of risk aversion – a negative attitude toward risk, while person B may perceive playing poker as the less risky option and engage in it, also out of risk aversion) or, whether their risk perceptions agree or not, because they have different attitudes toward risk as they see it (with persons C and D agreeing on the greater risk posed by skydiving, but person C being attracted by this risk and thus taking it on, and person D being repelled by it and thus choosing to play poker instead).

When modeled within this framework (as described in the section ‘[Perceived-Risk Attitude as a Stable Trait](#)’), situational differences in risk-taking turn out to result from differences in the perception of risk in different situations rather than differences in willingness to take on (perceived) risk, thus restoring credibility to the notion of PRA as a stable trait. Individual differences in PRA exist, but are smaller and less systematic than individual and group differences in risk perception (with some notable exceptions, e.g., adolescent risk-taking). While the determinants of risk perception are relatively

well known at this point not much is known about the determinants of PRA. As described in the section ‘[Personality, Risk Perception, and Perceived-Risk Attitude](#)’, personality differences in variables known to be related to risk-taking seem to have their effect often via differences in risk perception. In the section ‘[Multiple Processes in Risk-Taking: Affect, Deliberation, Cognitive Control](#)’ we describe an important factor influencing risk-taking that is related to both situation and person, namely the type of the decision processes involved in the decision, in particular more ‘hot’ affective–motivational processes versus more ‘cold’ deliberative processes (Figner et al., 2009; Figner and Weber, 2011; Metcalfe and Mischel, 1999). Affective processes have received growing attention in the last two decades. It has become clear that they can influence risk-taking by different routes, for example, in the form of concrete emotions such as anger, fear, or sadness or by way of more subtle and persistent moods (Loewenstein et al., 2001; Peters et al., 2006). Further, it has been shown that (individual or experimentally induced) differences in the *regulation* of these affective phenomena also influence risky decisions (e.g., Heilman et al., 2010; Panno et al., 2013).

### Domain and Framing Effects on Risk-Taking

In the EU framework, the dominant normative model of risky decision-making, the term ‘risk-taking’ is used to characterize choice patterns. Choice of a sure outcome over a lottery with equal expected value is modeled by a concave utility function and described as risk-averse; choice of the lottery is modeled by a convex utility function and described as risk-seeking. Despite the fact that risk-taking simply describes the curvature of the utility function that is derived from a series of choices, “those who coined the term *risk aversion* had in mind the psychological interpretation that someone who prefers the expected value of a gamble over playing the gamble *does not like to take risks*” (von Winterfeldt and Edwards, 1986: 256). Popular as well as managerial folklore tends to interpret risk-taking as a personality trait.

Bromiley and Curley (1992) review the evidence for risk-taking as a personality trait, i.e., as a preference for risk that is stable across situations, and find it lacking (see also Fox and

Tannenbaum (2011) for a more recent overview coming to a similar conclusion). Risk-taking seems to be influenced jointly by the situation and characteristics of the decision-maker, as well as by the interaction of the two (Figner and Weber, 2011). Decision domains in which the same person often shows different degrees of risk-taking include games of chance/gambling, financial investing, business decisions, health decisions, recreational choices, social choices, and ethical decisions (MacCrimmon and Wehrung, 1986; Blais and Weber, 2006; Weber et al., 2002). Further, even within the same domain, individuals can differ in their risk-taking depending on whether they make the decisions in an affect-charged versus a deliberative state (Figner et al., 2009; Figner and Weber, 2011; Gladwin et al., 2011). Modeling risk-taking within EU theory and defining risk attitude as the curvature of a utility function thus is clearly problematic for the notion of risk attitude as a personality trait. Attempts to restore cross-situational consistency to the construct of risk attitude by factoring differences in marginal value (e.g., the incremental value of an additional dollar or an additional life saved) out of the utility function were not successful (Keller, 1985; Weber and Milliman, 1997).

Prospect theory (Kahneman and Tversky, 1979) generalizes EU by postulating different utility functions for outcomes that are framed as gains as opposed to losses. For moderate to high probabilities, when outcomes are framed as gains, choices tend to be risk-averse; when the same outcomes are framed as losses (relative to a higher reference point), choices tend to be risk-seeking, further complicating the interpretation of risk-taking in the EU sense as a stable trait.

### Risk-Taking and Risk Perception

In the risk-value framework, risk-taking is a compromise between greed (value) and fear (risk). Risk-value models in finance equate 'value' with the expected value of a risky option and 'risk' with its variance. Generalized risk-value models allow for a broader range of risk measures. Situational differences such as outcome framing also result in different risk perception (Mellers et al., 1997). As a result, apparent differences in risk-taking may be the result of differences in the perception of the riskiness of the choice options, and not of differences in attitude toward (perceived) risk. Cooper et al. (1988) report, for example, that – contrary to managerial folklore – the characteristic that differentiates entrepreneurs from other managers is not a more positive attitude toward risk, but instead an overly optimistic perception of the risks involved. For an outside observer who perceives risk more realistically, entrepreneurs will thus appear to take great risks. However, when differences in risk perception are factored out, entrepreneurs – just as other managers – demonstrate a preference for tasks that they see as only moderate in risk (Brockhaus, 1982).

### Perceived-Risk Attitude as a Stable Trait

PRA is a measure of the degree to which individuals find perceived risk attractive (or unattractive) and therefore will choose alternatives that carry greater (or less) risk, all other

things being equal. Weber and Milliman (1997) examined its cross-situational consistency by asking commuters to choose between pairs of trains that had risky arrival times (that depended on making a connection that had a stated probability) and to judge which of the two trains was the riskier one. The two trains in each pair had arrival times with equal expected value but different variance. Some pairs of trains had only positive arrival times (faster or equal to current travel times), others had only negative arrival times (slower or equal to the status quo). There was little consistency in people's risk-taking across the gain and the loss domain when risk-taking was defined in the EU sense. Few commuters had preferences that resulted in utility functions that were either both risk-seeking (convex) or both risk-averse (concave). However, consistency across the two domains was very high when PRAs were compared. The majority of commuters were risk-averse in both domains, i.e., consistently chose the train in a given pair that they had judged to be the less risky of the two.

In another study, MBA students participated in two sessions of an investment game where they had to pick one of six stocks (described by standard financial indicators) in each of 10 investment periods, and had to rate the riskiness of the stocks at different points throughout each session (Weber and Milliman, 1997). In one session, participants lost money in most of the 10 periods, whereas in the other session they mostly made money. Choices were very different across sessions (with more switching between stocks in the failure session), as were the ratings of the riskiness of the six stocks. However, over 80% of investors had the same PRA in both sessions, with three-quarters consistently investing in stocks that they perceived to be less risky and one-quarter consistently investing in stocks that they perceived to be more risky.

In a cross-national study, Weber and Hsee (1998) obtained risk judgments as well as minimum buying prices for risky financial investment options from respondents in the USA, Germany, the People's Republic of China, and Poland. Both risk judgments and buying prices showed significant cross-national differences, with Americans perceiving the most risk and Chinese paying the highest prices. However, after differences in risk perception were taken into consideration, the proportion of individuals who were perceived risk-averse or perceived risk-seeking were not significantly different in the four countries, with the majority again being perceived risk-averse, and only a small percentage in each country being perceived risk-seeking.

### Personality, Risk Perception, and Perceived-Risk Attitude

Some psychologists have questioned the assumption of finance models that people will and should strive to minimize risk, arguing instead that people's ideal point for risk or uncertainty could differ, either as a personality difference (Lopes, 1987) or as a situational difference (Weber and Kirsner, 1997). Ideal-point models (Coombs, 1975) assume a person will perceive the riskiness of an alternative as the deviation between the alternative's level of uncertainty or unpredictability and the person's ideal point on the

uncertainty continuum. Perceived risk of an alternative with a high objective level of uncertainty would be high for a person with a low ideal point, but low for a person with a high ideal point. Individual differences in ideal points for risk and uncertainty have been measured by the construct of sensation seeking (Zuckerman, 1979), which seem to have some biological basis (Zuckerman et al., 1988) and vary with age and gender. Bromiley and Curley (1992) reported evidence linking sensation seeking to behavioral correlates that include greater risk-taking, especially in the health/safety and recreational domain. Weber et al. (2002) also reported high positive correlations between sensation seeking and its subscales in several content domains, with especially high correlations between the thrill-and-adventure-seeking subscale and recreational risk-taking and the disinhibition subscale and ethical risk-taking. Consistent with the predictions of ideal-point models, the path by which differences in sensation seeking seem to affect risk-taking appears to be differences in the perceptions of risk, rather than differences in PRA. For example, Weller and Tikir (2011) found both domain-general and domain-specific relationships between perceived risks and benefits and risk-taking on the one hand and HEXACO personality traits on the other hand: The personality trait emotionality was associated with heightened risk perception while the trait conscientiousness was associated with lower perceived benefits, both in a domain-general manner. In contrast, the trait openness was associated with risk-taking and perceived benefits in the social and recreational domain, while the trait honesty/humility was associated with greater risk-taking in the health/safety and ethical domain. These results show that personality traits can be related to both domain-specific and domain-general aspects of risk-return tradeoffs and risk attitudes.

### Multiple Processes in Risk-Taking: Affect, Deliberation, Cognitive Control

Recent decision research has highlighted the role of different types of processes involved in risky decisions. Some risky decisions are made in emotionally charged contexts while other decisions are made in a cold deliberative state and these states can affect individuals' risk-taking levels (Figner and Weber, 2011). Figner, Weber, and colleagues developed a 'hot' affective and a 'cold' deliberative version of a risky choice task (the Columbia Card Task, CCT; Figner et al., 2009; Figner and Weber, 2011) and showed that age and other individual differences are not uniform across these types of risk-taking situations, highlighting both that context and involved processes are crucial to understanding risk-taking and that the assumption of a simple single unitary concept of risk-taking is problematic.

For example, adolescents, compared to adults, showed increased risk-taking levels only in the hot, but not the cold, CCT (Figner et al., 2009). This result points to the crucial role of affective processes as well as the (relative lack of) cognitive control processes in adolescent risk-taking and is consistent with currently popular neurodevelopmental models of adolescent risk-taking. This model explains adolescents' risk-taking tendency as a consequence of a developmentally

transient potential for an imbalance between strong (subcortical) bottom-up affective-motivational processes versus still immature (prefrontal) top-down cognitive control processes (Gladwin et al., 2011; Somerville et al., 2010; see also Blakemore and Robbins, 2012; Crone and Dahl, 2012; Ernst and Fudge, 2009; Steinberg, 2010; Reyna and Farley, 2006). Thus, adolescent risk-taking is assumed to originate from an interaction between person (adolescents' potential imbalance between strong active affective-motivational processes and relatively weak cognitive control processes) and situation (only in situations in which substantial affective processes are triggered is increased adolescent risk-taking expected).

Further highlighting the role of contextual characteristics and involved processes, personality traits have been found to show differential associations with 'hot' versus 'cold' risky decisions. As expected, risk-taking levels in the hot, but not the cold CCT, were correlated with the motivational construct 'need-for-arousal' (Figner et al., 2009); this construct is related to Zuckerman's sensation seeking construct which, in a separate study, showed qualitatively the same associations with hot and cold risk-taking as need-for-arousal (Penolazzi et al., 2012). In contrast, risk-taking in the cold CCT are related to individual differences in executive functions such as planning and reasoning (Figner et al., 2009) as well as scores on the I7 scale that measures trait impulsivity (Penolazzi et al., 2012). An advantage of the CCT is that it allows for the decomposition of overt risk-taking levels into underlying processes, namely sensitivity to gain, loss, and probability as well as risk-return tradeoffs, which also show differential associations with personality variables. Individuals' reward responsiveness was correlated with increased gain sensitivity when losses were high in the hot CCT whereas individuals' sensitivity to punishment was related to participants' loss sensitivity in the cold CCT (Penolazzi et al., 2012).

Highlighting that not only affect, but also its regulation affects risk-taking, recent work has shown that individual (as well as experimentally induced) differences in the strategies people adopt to regulate emotions while making risky decisions lead to differences in risk-taking. For example, Panno et al. (2013) have shown that habitually increased reliance on cognitive reappraisal as emotion regulation strategy is associated with increased risk-taking levels in the cold CCT, accompanied by a reduced sensitivity to both the magnitude and the probability of a possible loss (see Heilman et al., 2010 for similar risk-taking results using experimentally induced emotion regulation strategies). Finally, clinical phenomena related to affective processes and/or their (relative lack of) regulatory processes have been shown to be related to risk-taking; for example, Di Rago et al. (2012) have shown that anxiety, but not depression, is related to decreased risk-taking (see also Maner et al., 2007; Giorgetta et al., 2012). Taken together, these results highlight the importance of both age-related and other individual differences such as personality traits (which also extend into the domain of clinically relevant phenomena) when investigating risk-taking levels; further, the differential associations with 'hot' versus 'cold' forms of risky decisions underscore the need to take into account the context and type of involved processes and the crucial role of affective processes.

## Summary, Caveats, and Future Directions

The current research consensus suggests an interactional model of risk-taking (e.g., [Sitkin and Weingart, 1995](#); [Figner and Weber, 2011](#)) in which situational characteristics and person-centered characteristics, as well as their interaction (e.g., in adolescents) jointly influence risk-taking. Situational constraints include the content domain of the risky decision, contextual variables such as outcome framing and aspiration levels ([Lopes, 1987](#)), and which psychological processes are involved in making risky decisions. Person-centered characteristics include age, gender, culture, and personality. Often, these variables influence risk-taking by changing people's perception of the riskiness of decision alternatives, rather than by affecting their willingness to take on more or less risk. However, these characteristics, e.g., age, can also interact with situational characteristics such that, e.g., excessive adolescent risk-taking is only likely to occur when affective processes are strongly involved and overwhelm adolescents' still immature cognitive control abilities that otherwise might counteract impulsive risk-taking, as it is usually the case in adults ([Figner et al., 2009](#); [Figner and Weber, 2011](#); [Gladwin et al., 2011](#); [Somerville et al., 2010](#)).

Because of the domain specificity of risk-taking, measures of risk attitude that employ choice situations across a range of content domains (e.g., the Choice Dilemmas Questionnaire of [Kogan and Wallach, 1964](#)) have little predictive validity. Domain-specific scales of risk-taking that help to diagnose apparent differences in risk-taking into differences in either risk perception and/or PRA have been developed ([Blais and Weber, 2006](#); [Weber et al., 2002](#)). Similarly, the involved processes matter, e.g., whether risky decisions are made using mainly deliberative calculus or 'hot' affective processes; tasks that systematically vary the involvement of these processes have been recently developed as well ([Figner et al., 2009](#); [Figner and Weber, 2011](#)). Future research will provide additional insights into the complex interactions between personality and situation that have been explored for a range of other traits ([Mischel, 1999](#)) with respect to risk-taking. A combination of task analysis and theory about the reasons for risk-taking and its cognitive and emotional constraints should lead to the development of gender-, culture-, and domain-specific risk-taking profiles, that predict level of risk-taking in a situation- and person-contingent fashion.

*See also:* Decision Making, Psychology of; Decision Making: Nonrational Theories; Defiant Behavior During Adolescence across Cultures; Emotional Regulation; Flow in Motivational Psychology; Personality Changes During Adolescence Across Cultures; Personality and Adaptive Behaviors; Personality and Economics; Self-Regulated Learning; Self-Regulation During Adolescence: Variations Associated with Individual-Context Relations; Sensation Seeking: Behavioral Expressions and Biosocial Bases; Social Psychology; Stress in Adolescence: Effects on Development; Successful Aging in Western Societies: The 'Selection, Optimization, and Compensation' Model.

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## Relevant Websites

- <http://columbiacardtask.org> – For the Columbia Card Task (CCT).
- <http://dospert.org> – For the Domain-Specific Risk-Taking (DOSPERT) Scale.