*Original Research Article*

Psychological Reports
2021, Vol. 0(0) 1–15

DOI: 10.1177/00332941211054777
journals.sagepub.com/home/prx
SAGE

# How to Measure Propensity to Take Risks in the Italian Context: The Italian Validation of the Risk Propensity Scale

**Giulia Marton, Dario Monzani, Laura Vergani, Silvia Francesca Maria Pizzoli, and Gabriella Pravettoni**

Applied Research Division for Cognitive and Psychological Science, IEO, European Institute of Oncology IRCCS, Milan, Italy

Department of Oncology and Hemato-oncology, University of Milan, Milan, Italy

## Abstract

Risk propensity is a multifaced construct that influences many aspects of life, such as decision making. In the present study, the psychometric characteristics of the Risk Propensity Scale (RPS) have been explored for the first time in an Italian sample. The RPS is a 7 item self-report questionnaire measuring people's tendency to take risks. The English RPS has been translated following the forward–backwards translation method, and it was filled out by 199 participants. Since its dimensionality has never been explored before, its factor structure has been analysed with exploratory factor analysis that confirmed the one-factor structure of the questionnaire and the retention of all the items. The Italian version of the RPS has high internal consistency (Cronbach alphas .78), and almost all the items were positively and significantly correlated. The convergent and discriminant validity, analysed by considering the associations with decision-making styles and an implicit measure of risk propensity, were satisfactory. Overall, the Italian version of the RPS is a valid and quick questionnaire useful to measure propensity to take risks in the Italian context.

**Corresponding Author:**
Giulia Marton, Department of Oncology and Hemato-Oncology, University of Milan, Via Festa Del Perdono 7, 20122 Milan, Italy.
Email: giulia.marton@ieo.it

**Keywords**
Italian validation, risk propensity, decision making

## Introduction

Decision making involves rationality that guides the recognition of the best alternatives between the ones presented (Bernard et al., 2007). This process is hardly a linear one, as conditions in which individuals have to decide are scattered with risks and uncertainty. When there is not a single sure answer, the decision-making process is subject to risk. Risks are related to the probability of being affected by something dangerous (Paek et al., 2017). Uncertainty about risk magnitude is caused by the judgement of the individuals about the situation as unpredictable and unsure. The interpretation of a situation and its subjective deduction is moderated by risk perception (Slovic, 2000).

Two dimensions characterize risk-taking: risk propensity and risk perception (Nicholson et al., 2002). Different dispositional tendencies, cognitive response and past experience conceptualize the propensity to take risks (Sitkin & Pablo, 1992). Risk perception, instead, is defined as the individuals' subjective evaluations and interpretations about risks (Slovic, 2000).

Considering all these characteristics altogether, the risk-taking tendency is an individual feature that remains stable over time (Frey et al., 2017) and that has a big impact on life (Nicholson et al., 2002). For example, every day we have to make decisions that have to be taken quickly. Guo et al. (2017) gave the example of the decision to risk a ticket when driving or the immediate decisions that Wall Street brokerage deal with: a single fast decision put them at risk to lose a large amount of money. A pivotal work divides the decisions into two systems: system 1 decisions are fast, intuitive and emotional, and system 2 decisions are more deliberate and take more time (Epstein, 1994; Kahneman, 2003, 2011).

Risk propensity is important in many other life situations such as in the health environment (Gorini et al., 2012). For example, even if there is an association to skin cancer, individuals with a higher propensity to risk are more likely to expose more to the sun, have lower sun protective habits and tan intentionally more than individuals with a low propensity to take risks (Morton et al., 2019). Moreover, individuals with a higher propensity to take risks will risk their health as with all other aspects of life (Nicholson et al., 2002).

The propensity to take risks is strictly related to bias, in particular, framing bias: the way information is presented to people influences their choice (Pravettoni et al., 2016). In particular, in risk propensity, the way the outcome is presented influence the decision and our behaviour (Robbins, 2015). A sample of lung cancer patients that had to decide whether to have surgery or not was told that they had a '68% chance of living for more than a year', or that they had a '32% chance of dying by the end of the year'. Patients presented with the first scenario were more likely to undergo surgery (Robbins, 2015). However, not only cancer patients make decisions by trying to avoid losses. In general,

when individuals have to face a potential loss, they are more willing to take risks to avoid such loss. Yeh et al. (2021), instead, explored the decision to pay for private health insurance and its relationship with risk propensity. As expected by the authors of the study, risk propensity influenced the decision: individuals with a high propensity to take risks were less interested in owning a private long-term health insurance.

The effects of risk propensity on decisions are also studied in investment and economical decisions. The individual differences in decision making have effects on the risky decision to invest money (Gambetti & Giusberti, 2019): some decision-making style led to invest more money, and some other decision-making style led to less risky economical choice.

Considering the importance of risk propensity, it is essential to have a useful and short tool to measure it. Meertens and Lion (2008) developed the Risk Propensity Scale (RPS), a questionnaire composed of 7 items with a 9-point Likert scale response format. The questionnaire was developed in English and never been translated into other languages. Since then, following a quick search on Google Scholar, more than two hundred and fifty scientific articles have cited this scale. Its dissemination, availability and usability have made the RPS an essential tool in research and psychological practice concerning risk propensity in daily life situations, as well as in the more specific environment of health care.

## *Objective*

The objectives of the present study were to explore the factor structure of the RPS in a sample of Italian adults and to validate its psychometric characteristics. In their original work, Meertens and Lion (2008) did not assess the factor structure of the RPS through any exploratory or confirmatory factor analysis. They simply assessed the scale reliability and evaluate its associations with external measures including risky behaviours, self-esteem and need for cognition. Thus, this work represents the first attempt to properly explore the dimensionality of the RPS by conducting EFA. Moreover, we aimed to evaluate convergent and discriminant validity by assessing its relationships with decision-making styles and with an implicit measure of risk propensity. Specifically, we expected to find a positive relationship with the implicit measure of risk propensity.

We decided to evaluate the convergent and discriminant validity of the RPS with a measure of decision-making style because of previous empirical evidence regarding its association with risk propensity (Robbins, 2015; van den Bos et al., 2013; Yeh et al., 2021). The link between the decision-making style and risk, even if it is largely explored, does not have univocal finds: some studies found a negative association with a rational decision-making style and a positive association with an intuitive and spontaneous decision-making style and risk (Loo, 2000); instead, another study found that risk was positively related to the rational decision-making style, but it was negatively related to the dependent and avoidant ones. For this reason, we decided to consider all the decision-making styles. Our hypothesis of the association also kept into

consideration that high risk takers make fast decisions (Robbins, 2015). We expect our results to reflect this characteristic.

(van den Bos et al., 2013) gave the link between decision making and risk propensity a more in-depth point of view considering gender differences. Their results showed that men and women decide in different ways during ambiguous and risky situations: men make decisions considering global information, instead, women make decisions on more detailed information. For this reason, we aimed also at assessing gender-related differences in risk propensity. Another explored difference regarding decision making and risk propensity is age related. A characteristic of adolescents is the imbalance between the sensitivity of a high reward system and cognitive regulation. For this reason, their lack of control and high sensation seeking lead them to poor decisions in risky situations that could lead to risky behaviours (Steinberg, 2010; Vaughn et al., 2021).

Consequently, one of our objectives was also to assess associations with age. This decision came also from one of the main limitations of the original validation study: having a sample composed of students did not allow to test the association of risk propensity with age.

## Methods

### Participants

The sample consisted of 199 participants (66.8% female) with a mean age of 31.90 (*SD*: 11.21 min = 18; max = 74). Individuals were recruited through a snowball recruitment strategy and via social networks; the survey was administered with Qualtrics. The majority of them were single (64.8%) followed by married (19.6%), cohabitants (%. 12.6%), divorced (2.5%) and only .5% were widow/widowed.

The 38.7% had a high school diploma, followed by the 36.7% that were graduate. The most frequent occupations were students (33.2%), white collars (18.6%) and health care professionals (17.1%). Participation in the study was voluntary, and participants could decide to withdraw at any moment. All participants agreed on informed consent. The study was conducted in compliance with the Declaration of Helsinki ethical standards.

### Measures

The measures were administered online; the whole duration of the survey was around 20 minutes. The online survey was composed of the following:

*General decision-making style (GDMS).* The scale was developed by Scott and Bruce (1995). It is a questionnaire that measures how decisions are addressed. It consists of 25 items, measured on a 5-point scale (from strongly disagree to strongly agree). The Italian version of the questionnaire was adapted by Gambetti et al. (2008) and the original version is composed of five subscales: Rational: (Cronbach's alpha: .78) the

individual searches for a logical explanation and evaluates logically all the alternatives (item example: 'I make decisions in a logical and systematic way'); Intuitive: (Cronbach's alpha: .65) the individual decision is based on feelings (item example: 'When I make decisions, I tend to rely on my intuition'); Dependent: (Cronbach's alpha: .88) the individual looks for advice and asks for direction (Item example: 'I rarely make important decisions without consulting other people'); Avoidant: (Cronbach's alpha: .77) the individual tries to avoid decisions (item example: 'I avoid making important decisions until the pressure is on'); and Spontaneous: (Cronbach's alpha: .79) the individuals decides instantly (Item example: 'I generally make snap decisions'). The score was calculated as the sum of the items comprehended in each subscale.

*Balloon analogue risk task (BART).* The BART was developed by Lejuez et al. (2002), and it is a computerized test that measure risk taking in an implicit manner. It is based on the recreation of real world risky behaviours, and it asks the participants to find a balance between losses and rewards. Participants were presented with a balloon with the aim to win as much money as possible. Pushing a button, individuals could pump the balloon and every pump will earn them some money; they could decide to collect the win whenever they want, but the balloon could suddenly explode, and they will lose everything. The score was calculated as the mean of the numbers of the pumps that each subject took across 10 trials.

*The RPS.* The RPS was developed by Meertens and Lion (2008). It is a questionnaire that evaluates the propensity to take risks. It consists of 7 items (item example: 'I prefer to avoid risks') measured on a 9-point scale (from totally disagree to 9 totally agree). The score was calculated as the mean of the answers. The English version of the scales had a Cronbach's alpha of .77, but the dimensionality of the questionnaire was not explored.

## *Translation of the RPS*

The Italian translation of the RPS followed the forward–backwards translation method (Brislin, 1970). The questionnaire was translated firstly independently by two authors with a forward translation. Both the authors had advanced knowledge of the English language and were Italian mother tongue. The two translated questionnaires were then compared, and errors and divergences were solved; this step produced one version of the Italian questionnaire. The items were then back-translated by a third researcher with advanced knowledge of the English language, and who was blind to the original version of the questionnaire. The back translation produced an Italian questionnaire virtually identical to the original English one. The questionnaire had four reversed items (items 1, 2, 3 and 5) which were kept as reversed in the translation.

### Statistical Analysis

Firstly, we evaluated the descriptive statistics of RPS items on the sample. Secondly, we calculated the structure and internal consistency of the scale. The factorial structure of the RPS was evaluated through Exploratory Factor Analysis (EFA). Since Meertens and Lion (2008) did not explore the dimensionality of the RPS but just assessed its reliability, in our study, EFA was preferred over Confirmatory Factor Analysis to gain a first and valid exploration of the factor structure of the RPS. To assess sample adequacy, we used the Kaiser–Meyer–Olkin and Bartlett's Test of Sphericity.

We employed a principal axis factoring analysis and a parallel analysis to identify the exact number of factors to be retained. We decided to perform a parallel analysis according to Horn (1965), who stated that the parallel analysis is the best method to select the optimal number of factors. The most used Kaiser criterion often overestimates the number of factors (Nullaly & Bernstein, 1994), and it could be considered a poor method compared to the scree plot and the parallel analysis (Zwick & Velicer, 1986). We then evaluated the factor matrix of the remaining factors: if an item factor loading was greater than the cut off of .32, the item was considered adequate (Tabachnick & Fidell, 2001).

The internal consistency of the RPS was calculated with Cronbach's alpha coefficients.

As a final step, we evaluated correlation coefficients of the RPS with demographic variables, decision-making style (GDMS) and risk-taking (BART). To evaluate the correlation effect size, we used Cohen's (1988) criteria with values ranging between |.10| and |.29| indicating a small effect, |.30| and |.49| a medium effect and ≥|.50| a large effect.

We performed all the analyses with the SPSS package (version 26, IBM).

## Results

### Descriptive Statistics

Descriptive statistics of RPS single items are reported in Table 1. The mean scores vary from 3.08 and 4.65, while the mean of the overall score is 3.71. Almost all the items of the questionnaire were positively and significantly correlated. The only exception was found between item 6 and item 5 which were not correlated. Except for the correlation between item 5 and item 6, all the other correlations had medium effect size (Table 2).

### EFA

Answers at RPS's items were evaluated to check if they were adequate to perform an EFA. To know if the sample could be considered satisfactory, we performed the Kaiser–Meyer–Olkin test (KMO). The total KMO value was .80 which could be evaluated as a great sample size for factor analysis, well above the acceptable limit of .50 (Hutcheson & Sofroniou, 1999). To evaluate if the between-item correlation were sufficiently large,

**Table 1.** Descriptive statistics of RPS ($N$ = 199).

| Item | Minimum–maximum | $M$ ($SD$) |
|---|---|---|
| 1 - Safety first (*La sicurezza prima di tutto*) | 1–9 | 3.08 (1.78) |
| 2 - I do not take risks with my health (*Non corro rischi per la mia salute*) | 1–9 | 3.86 (2.04) |
| 3 - I prefer to avoid risks (*Preferisco evitare i rischi*) | 1–9 | 3.97 (2.04) |
| 4 - I take risk regularly (*Corro rischi abitualmente*) | 1–9 | 3.25 (1.93) |
| 5 - I really dislike not knowing what is going to happen (*Non mi piace non essere a conoscenza di quello che sta per succedere*) | 1–9 | 3.36 (2.51) |
| 6 - I usually view risk as challenges (*Di solito considero i rischi come sfide*) | 1–9 | 4.65 (2.22) |
| 7 - I view myself as a … Risk avoider - Risk seeker (*Mi vedo come … Qualcuno che evita I rischi - Qualcuno che ricerca i rischi*) | 1–9 | 3.84 (1.98) |
| Mean tot | 1–7.57 | 3.72 (1.38) |

**Table 2.** Between items correlation.

| RPS Item | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | — | — | — | — | — | — | — |
| 2 | .48[a] | — | — | — | — | — | — |
| 3 | .44[a] | .39[a] | — | — | — | — | — |
| 4 | .40[a] | .27[a] | 55[a] | — | — | — | — |
| 5 | .36[a] | .24[a] | 25[a] | 23[a] | — | — | — |
| 6 | .19[a] | .18[b] | 45[a] | .54[a] | 11 | — | — |
| 7 | .24[a] | .28[a] | 48[a] | 57[a] | .23[a] | .59[a] | — |

[a]Correlation is significant at .01 (2 – tailed).
[b]Correlation is significant at .05 (2 – tailed).

we performed Bartlett's test of sphericity ($p < .001$), which confirmed the possibility to perform the EFA.

Scree plot inspection supported the one-factor structure of the items, but Kaiser–Guttman's criterion reinforced the possibility of a two-factor solution. The first factor showed an eigenvalue of 3.20, and the second factor had an eigenvalue of 1.21.

We performed a parallel analysis (Horn, 1965) that supported the extraction of only one factor (real eigenvalues of the first factor 3.20, randomly generated eigenvalues 1.37 and eigenvalues of the second factor 1.21, randomly generated eigenvalues 1.22).

To consider which items to retain, we evaluate items factor loading (Table 3). The factor loadings of the items were higher than the cut off and vary from .36 (item 5) to .76 (item 4).

## *Internal Consistency, Convergent and Discriminant Validity*

The internal consistency of the RPS was evaluated through Cronbach's alpha and the inter-item correlation was evaluated for the questionnaire.

Internal consistency was acceptable with a Cronbach's alpha indices of .78. Pearson's correlation coefficients and t-test were calculated between the RPS and participants' age and gender. There was no significant correlation with participants' age and RPS answers ($r = .06$, $p = .445$) There was no significant gender-related difference in risk propensity ($t(177) = 1.85$, $p = .857$).

Convergent validity was evaluated with the BART results and with GDMS subscales results. The correlations between the RPS and the BART ($r = .24$, $p < .01$) and between the RPS and the spontaneous subscale of the GDMS ($r = .25$, $p < .01$) were significantly

**Table 3.** Exploratory factor analysis, factor loadings ($N = 199$).

| Item | Principal axis factoring |
|---|---|
| 4 | .76 |
| 3 | .74 |
| 7 | .70 |
| 6 | .61 |
| 1 | .55 |
| 2 | .48 |
| 5 | .36 |

**Table 4.** Descriptive statistics of SWLS, BART, and GDMS and significant correlation coefficients with RPS.

| Scale | Minimum–maximum | *M* (*SD*) | Correlations (*r*) with RPS |
|---|---|---|---|
| BART[a] | 4.2–60 | 27.61 (12.17) | .24[b] |
| GDMS - Spontaneous | 5–25 | 12.58 (3.84) | .25[b] |
| GDMS - Rational | 12–25 | 20.00 (3.30) | −.30[b] |
| GDMS – Dependent | 6–25 | 16.35 (4.59) | −.09 |
| GDMS - Intuitive | 7–25 | 17.44 (3.14) | .08 |
| GDMS - Avoidant | 5–25 | 12.94 (4.43) | −.16[c] |
| Age | 18–74 | 31.90 (11.21) | .06 |

[a]The correlation between BART and RPS was performed on a sample of 179 individuals because of missing data for the BART.
[b]Correlation is significant at .01 (2 – tailed).
[c]Correlation is significant at .05 (2 – tailed).

positive, and the effect size was small, respectively. Correlations between BART and RPS were performed on a sample of 179 individuals because of missing values for BART. Discriminant validity, instead, was evaluated with the GDMS's rational and avoidant subscales. The correlations between the RPS and the GDMS's rational subscale ($r = -.30$, $p < .01$) and between the RPS and the GDMS's avoidant subscale ($r = -.16$, $p < .05$) were significantly negative, respectively. In this case, the effect sizes of the correlations were medium and small.

Correlation coefficients and descriptive statistics of the scales are reported in Table 4.

## Discussion

The current study examines the RPS psychometric characteristics and its convergent and discriminant validity in an Italian context.

### *Dimensionality and Internal Consistency of the RPS*

We evaluated the sample by performing an EFA on the Italian version of the questionnaire that supported the one-factor structure of the questionnaire in conformity with the original English version. To the best of our knowledge, this is the first study to evaluate the dimensionality of the RPS.

The questionnaire had an acceptable internal consistency with a Cronbach's alpha values of .78. This result was also consistent with the English version of the scale that found a Cronbach's alpha of .77 (Meertens & Lion, 2008).

Considering the matrix of correlation between the different items that composed the scale, all the items were significantly and positively correlated with each other except for item 5 and 6. This particular result could be explained by the subject of the different items: item 5 'I really dislike not knowing what is going to happen' differ from all the other items. This item seems to be more focused on exploring future events; instead, all the other items are more related to risk (e.g. item 6: 'I usually view risk as challenges'). Confirming this hypothesis, item 5 was also the item with the lowest factor loading (.36). Despite these results, item 5 had a positive and significant relationship with the latent factor of risk propensity and it exceeds the cut off given by literature for the factor loading (Tabachnick & Fidell, 2001).

### *Convergent and Discriminant Validity of the RPS*

We evaluated the convergent validity through BART, which is considered a reliable instrument to measure risk-taking in real-life scenarios (Keller & Gollwitzer, 2017). The results of the Italian version of the RPS were consistent with the results of BART: we found a positive and significant correlation with the scale confirming that the Italian version of RPS is a valid instrument to measure risk propensity in real-life situations. The correlation between the two measures was positive and significant but weak. The weakness of the relationship could be explained by the fact that BART is a test that

implicitly measures risk; instead, the RPS is a questionnaire that measures risk propensity explicitly. The RPS is a useful and quick way to measure risk propensity but, as all the questionnaires used in psychology, is influenced by many factors that, instead, may or may not influence an implicit measure (Greenwald & Farnham, 2000). The factors influencing the self-report measures were indicated by Greenwald and Farnham (2000) as: demand characteristics (Orne, 1962), evaluation apprehension (Rosenberg & Rosnow, 1969), impression management (Tedeschi et al., 1971), self-deception (Gur & Sackeim, 1979) and self-enhancement (Greenwald, 1980; Taylor & Brown, 1988). All these factors could have influenced the RPS's answers and caused the weakness of the association between BART and RPS.

Considering the strict association of risk propensity with decision making, we also decided to compare the response to the Italian version of the RPS with the GDMS. This decision is in accord with literature that confirms that decision making is deeply influenced by risk propensity (Yeh et al., 2021). Only three of the five subscales of the GDMS have a significant relation with the Italian version of the RPS: we found only spontaneous, avoidant and rational subscales to be related with the propensity to take risks; instead, the dependent and intuitive subscales were not related. This result was in line with our expectation: the dependent and intuitive subscales did not evaluate decisions that are influenced by risk; instead, they are related to asking external confirmations or to internal feelings, and that scenario do not take into account risk. Rational and Avoidant subscales, per our hypothesis, were negatively related to the Italian's RPS; instead, spontaneous decision making was positively related. These results could be explained by literature: high-risk taker decide instantly (Robbins, 2015) and the rational and avoidant subscales consider individuals who took time to decide; instead, spontaneous decision making leads to an immediate decision.

## *RPS and Age and Gender Differences*

We also considered the relationship between gender, age, and the RPS, and consequently risk propensity. We did not find any age and gender-related differences in risk propensity. These results add information about the RPS. The English RPS study used a sample that comprehended only students so that considerations about age were not possible; our study, instead, suggests that participant of different age did not differ from the propensity to take risks. The same result was found regarding gender: no difference was found regarding risk propensity between male and female participants.

This result is in contrast with what was found in the English RPS version study as the authors found that men risk more than women. Our study did not have a sample that comprehended only students (only 33% were students), so we hypothesise that in the study by Meertens and Lion (2008), the gender differences were mainly given by the specific sample.

## Conclusion and Limitation

Overall, the present study confirms the psychometric characteristics of the Italian version of the RPS, but it has some limitations. Even if it was not composed only by students, the sample was quite young and well educated. Moreover, the quite low sample size did not allow to perform additional analysis, such as multi-group EFA to assess measurement invariance across different age groups. Future studies are needed to consider samples more representative of the population in terms of demographic characteristics (education, age and occupation).

Another limitation is that we did not consider personality trait questionnaires to measure the convergent and discriminant validity of the propensity to take risks. This is not the only limitation of the procedure of the validation of the questionnaire. Nicholson et al. (2002) states that risk propensity should be considered stable cross-domain. Their assumption came from the fact that the inconsistency found in some study can be explained by a low level of risk propensity in the examined individuals: people that are not high in risk propensity are as likely to avoid risk as they are to take a risk depending on the situations, the same observation could not be made when individuals have a high-risk propensity. For this reason, following the assumption of Nicholson et al. (2002), we decided to not test for test–retest reliability. Despite our reasoning, future studies are encouraged to expand the research field exploring these issues.

Despite these limitations, the Italian version of the RPS could be considered as a valid and appropriate questionnaire to measure the propensity to take risks. Risk propensity is an individual characteristic that should be addressed in many environments from clinical to nonclinical. Risk propensity could affect daily life's decisions but also on decisions regarding important aspects of the care considering it in the health environment. For example, if a cancer patient has to choose between two treatments, physicians must know the patient's propensity to take risks, so that it could guide them in deciding the most desirable choice (Marton et al., 2021; Monzani et al., 2020) and advise them, with the awareness that a patient might choose an option based on the higher perceived risk. Considering its multidisciplinary effects, the RPS could be considered an instrument useful and advisable in many contexts, and consequently, the propensity to take risks could have an impact on many aspects of an individual's life.

### Acknowledgements

Giulia Marton, and Laura Vergani are PhD students within the European School of Molecular Medicine (SEMM). The authors would like to acknowledge Dr. Linda Cairns for diligent proofreading of this review.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was partially supported by the Italian Ministry of Health with Ricerca Corrente and 5 × 1000 funds.

## ORCID iD

Giulia Marton https://orcid.org/0000-0002-6360-7569

## References

Bernard, A., Iyare, O., & Moore, W. (2007). Individual risk propensity and risk background. In 28th Annual Review Seminar Research Department Central Bank of Barbados (Vol. 1).

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, *1*(3), 185–216. https://doi.org/10.1177/135910457000100301

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Epstein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *American Psychologist*, *49*(8), 709–724. https://doi.org/10.1037//0003-066x.49.8.709

Frey, R., Pedroni, A., Mata, R., Rieskamp, J., & Hertwig, R. (2017). Risk preference shares the psychometric structure of major psychological traits. *Science Advances*, *3*(10), e1701381. https://doi.org/10.1126/sciadv.1701381

Gambetti, E., Fabbri, M., Bensi, L., & Tonetti, L. (2008). A contribution to the Italian validation of the general decision-making style inventory. *Personality and Individual Differences*, *44*(4), 842–852. https://doi.org/10.1016/j.paid.2007.10.017

Gambetti, E., & Giusberti, F. (2019). Personality, decision-making styles and investments. *Journal of Behavioral and Experimental Economics*, *80*(February), 14–24. https://doi.org/10.1016/j.socec.2019.03.002

Gorini, A., Miglioretti, M., & Pravettoni, G. (2012). A new perspective on blame culture: An experimental study. *Journal of Evaluation in Clinical Practice*, *18*(3), 671–675. https://doi.org/10.1111/j.1365-2753.2012.01831.x

Greenwald, A. G. (1980). The totalitarian ego fabrication and revision of personal history. *American Psychologist*, *35*(7), 603–618. https://doi.org/10.1037/0003-066X.35.7.603

Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, *79*(6), 1022–1038. https://doi.org/10.1037/KK122-3514.79.6.10?2

Guo, L., Trueblood, J. S., & Diederich, A. (2017). Thinking fast increases framing effects in risky decision making. *Psychological Science*, *28*(4), 530–543. https://doi.org/10.1177/0956797616689092

Gur, R. C., & Sackeim, H. (1979). Self-deception: A concept in search of a phenomenon. *Journal of Personality and Social Psychology. 37*, 147–169.

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, *30*(2), 179–185. https://doi.org/10.1007/BF02289447

Hutcheson, G., & Sofroniou, N. (1999). *The Multivariate Social Scientist. The multivariate social scientist: Introductory statistics using generalized linear models*. Sage Publications.

Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, *58*(9), 697–720. https://doi.org/10.1037/0003-066X.58.9.697

Kahneman, D. (2011). *Thinking fast, thinking slow. Interpretation*. Tavistock.

Keller, L., & Gollwitzer, P. M. (2017). Mindsets affect risk perception and risk-taking behavior: Illusory optimism and the BART. *Social Psychology*, *48*(3), 135–147. https://doi.org/10.1027/1864-9335/a000304

Lejuez, C. W., Richards, J. B., Read, J. P., Kahler, C. W., Ramsey, S. E., Stuart, G. L., Strong, D. R., & Brown, R. A. (2002). Evaluation of a behavioral measure of risk taking: The balloon analogue risk task (BART). *Journal of Experimental Psychology: Applied*, *8*(2), 75–84. https://doi.org/10.1037/1076-898X.8.2.75

Loo, R. (2000). A psychometric evaluation of the general decision-making style inventory. *Personality and Individual Differences*, *29*(5), 895–905. https://doi.org/10.1016/S0191-8869(99)00241-X

Marton, G., Pizzoli, S. F. M., Vergani, L., Mazzocco, K., Monzani, D., Bailo, L., Pancani, L., & Pravettoni, G. (2021). Patients' health locus of control and preferences about the role that they want to play in the medical decision-making process. *Psychology, Health & Medicine*, *26*(2), 260-266. DOI:10.1080/13548506.2020.1748211. https://doi.org/10.1080/13548506.2020.1748211.

Meertens, R. M., & Lion, R. (2008). Measuring an individual's tendency to take risks: The risk propensity scale. *Journal of Applied Social Psychology*, *38*(6), 1506–1520. https://doi.org/10.1111/j.1559-1816.2008.00357.x

Monzani, D., Vergani, L., Pizzoli, S. F. M., Marton, G., Mazzocco, K., Bailo, L., Messori, C., Pancani, L., Cattelan, M., & Pravettoni, G. (2020). Sexism interacts with patient–physician gender concordance in influencing patient control preferences: Findings from a vignette experimental design. *Applied Psychology: Health and Well-Being*, *12*(2):471–492. https://doi.org/10.1111/aphw.12193

Morton, R. L., Asher, R., Peyton, E., Tran, A., Smit, A. K., Butow, P. N., Kimlin, M. G., Dobbinson, S. J., Wordsworth, S., Keogh, L., & Cust, A. E. (2019). Risk attitudes and sun protection behaviour: Can behaviour be altered by using a melanoma genomic risk intervention? *Cancer Epidemiology*, *61*, 8–13. https://doi.org/10.1016/j.canep.2019.05.002

Nicholson, N., O'Creevy, M. F., Soane, E., & Willman, P. (2002). *Risk propensity and personality.* London Business School, Open University Business School and Said Business School Oxford.

Nullaly, J. C., & Bernstein, I. H. (1994). *The assessment of reliability. Psychometric theory.* https://www.scirp.org/(S(i43dyn45teexjx455qlt3d2q))/reference/ReferencesPapers.aspx?ReferenceID=1960143

Orne, M. T. (1962). On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American Psychologist*, *17*(11), 776–783. https://doi.org/10.1037/h0043424

Paek, H.-J., Hove, T., Paek, H.-J., & Hove, T. (2017). *Risk perceptions and risk characteristics*. Oxford Research Encyclopedia of Communication, June, 1–16. https://doi.org/10.1093/acrefore/9780190228613.013.283

Pravettoni, G., Mazzocco, K., Gorini, A., & Curigliano, G. (2016). Understanding cognitive processes behind acceptance or refusal of phase I trials. *Critical Reviews in Oncology/Hematology*, *100*, 69–73. Elsevier Ireland Ltd. https://doi.org/10.1016/j.critrevonc.2016.01.023

Robbins, S. P. (2015). *Decide & conquer: The ultimate guide for improving your decision making* (2nd ed.). Pearson Education.

Rosenberg, M. J., & Rosnow, R. (1969). The conditions and consequences of evaluation apprehension. In *Artifacts in behavioral research*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195385540.003.0007

Scott, S. G., & Bruce, R. A. (1995). Decision-making style: The development and assessment of a new measure. *Educational and Psychological Measurement*, *55*(5):818–831. https://doi.org/10.1177/0013164495055005017

Sitkin, S. B., & Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *The Academy of Management Review*, *17*(1), 9. https://doi.org/10.2307/258646

Slovic, P. (2000). *The perception of risk*. Earthscan Publications.

Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental Psychobiology*, *52*(3), 216–224. https://doi.org/10.1002/dev.20445

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). https://www.abebooks.com/9780321056771/Using-Multivariate-Statistics-4th-Edition-0321056779/plp

Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: a social psychological perspective on mental health. *Psychological bulletin*, *103*(2), 193-210.

Tedeschi, J. T., Schlenker, B. R., & Bonoma, T. V. (1971). Cognitive dissonance: Private ratiocination or public spectacle? *American Psychologist*, *26*(8), 685–695. https://doi.org/10.1037/h0032110

van den Bos, R., Homberg, J., & de Visser, L. (2013). A critical review of sex differences in decision-making tasks: focus on the Iowa Gambling Task. *Behavioural brain research*, *238*, 95-108. https://doi.org/10.1016/j.bbr.2012.10.002.

Vaughn, M. G., Salas-Wright, C. P., Alsolami, A. S., Oh, S., & Goings, T. C. (2021). Margin for error: Examining racial and ethnic trends in adolescent risk propensity. *Social Psychiatry and Psychiatric Epidemiology*, *56*(6), 993-1002. https://doi.org/10.1007/s00127-021-02026-8.

Yeh, S.-C. J., Wang, W. C., Chou, H.-C., & Chen, S.-H. S. (2021). Private long-term care insurance decision: The role of income, risk propensity, personality, and life experience. *Healthcare*, *9*(1), 102. https://doi.org/10.3390/healthcare9010102

Zwick, W. R., & Velicer, W. F. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, *99*(3), 432-442. https://doi.org/10.1037/0033-2909.99.3.432.

## Author Biographies

**Giulia Marton** is a psychologist and a PhD candidate of the University of Milan, Department of Oncology and Hemato-Oncology. She also works for the European Institute of Oncology (IEO) IRCCS Applied Research Division for Cognitive and Psychological Science. Her interests are dispositional optimism and its effects on the quality of life of cancer patients. She is also interested in the decision-making processes of the cancer patients and the impact that a personality trait, such as optimism, could have on those.

**Dario Monzani (PhD)** is a Research Fellow at the Department of Oncology and Hemato-Oncology, University of Milan and at the Applied Research Division for Cognitive and Psychological Science at the IEO European Institute of Oncology IRCCS, Milan. His main research activity focuses on studying the influence of personality traits, cognition and social-cognitive factors on medical decision-making, information processing, and patient-physician communication to develop effective and useful decisional supporting tools.

**Laura Vergani** is a psychologist and a PhD candidate in Medical Humanities in the European School of Molecular Medicine (SEMM), University of Milan. Her studies focus on analyzing the psycho-linguistic characteristics in patient-doctor communication in the oncological field, both in the face-to-face context and in the mediate one.

**Silvia Francesca Maria Pizzoli** is a psychotherapist and Post-Doctoral Researcher in the European School of Molecular Medicine (SEMM), University of Milan. Her studies focus on personalized approaches for the development of digital interventions to reach relaxation. She published works on tailored approaches for relaxation for lay people and breast cancer patients.

**Gabriella Pravettoni** is the Director of the Psychoncology Division at the European Institute of Oncology (IEO). She is Full Professor of General Psychology at the University of Milan, and the Coordinator of Doctorate FOLSATEC at the European School of Molecular Medicine. Her research activities especially focus on cognitive processes, decision-making and error prevention, with particular attention to the medical field, medical humanities, health, and centrality of patient.