Judgment and Decision Making, Vol. 15, No. 4, July 2020, pp. 499–508

Taking risks for the best: Maximizing and risk-taking tendencies

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Abstract

Maximizing is characterized by aspirations for the highest standards. The current study explored the relationship between maximizing and risk-taking tendencies in decisions subject to risk. We propose that people first refer to expectation (i.e., the overall utility expected from an alternative) when taking risky decisions. If expectation clearly identifies the best option, maximizing will not be correlated with risk-taking tendencies. If not, people refer to maximizing to reach a decision. Maximizing will be positively associated with risk-taking tendencies because the "upper bound" of risky options helps achieve the goal of seeking the best. Four studies showed that risk-taking tendencies increased with maximizing when the options had similar expectations (Studies 1 to 3). When expectations between options were clearly different (vs. similar), the positive relationship between maximizing and risk-taking tendencies was reduced (Study 4). These findings provide an insight into how maximizing is related to risk seeking.

Keywords: risky decision, maximizing, expectation

1 Introduction

Maximizing refers to a tendency to pursue "the best choice" in decision-making (Schwartz et al., 2002). Individuals with high maximizing tendencies are labeled as "maximizers", whereas those with low maximizing tendencies are labeled as "satisficers". Satisficers stop searching when they encounter an option that is deemed "good enough". In contrast, maximizers keep striving for excellence and pursue the "best choice". Due to the desire to achieve the best, maximizers are willing to search for as many alternatives as possible and readily accept the cost of time and effort (Chowdhury, Ratneshwar & Mohanty, 2009; Dar-Nimrod, Rawn, Lehman & Schwartz, 2009). They are also concerned about social comparisons (Schwartz et al., 2002; Weaver, Daniloski, Schwartz & Cottone, 2015). In addition, compared to satisficers, maximizers experience more negative emotions even though they have achieved better results (Iyengar, Wells & Schwartz, 2006).

Besides these findings, another important question concerns the relationship between maximizing and risk taking. We concentrate on this question for two reasons. First, the best choice differs under different cues in risky decisions. Expectation (i.e., the overall utility expected from an alternative) identifies "the best option". The alternative with the highest expectation is normatively the best option. However, the upper bound of an option identifies "the best outcome". The alternative with the highest upper bound potentially offers the best outcome. Therefore, exploring the relationship between maximizing and risk taking helps address the question of whether the goal of seeking the best applies to expectations or outcomes.

Second, the relationship between maximizing and risk taking remains unclear because extant research has obtained inconsistent results. Both positive (Hsieh & Yalch, 2019; Polman, 2010) and null (Jain, Bearden & Filipowicz, 2013; Lai, 2010) correlations between maximizing and risk seeking have been found. Given the inconsistent findings, further investigation on this link is needed.

1.1 Maximizing: Aspiration for high standards

Different conceptualizations of maximizing exist in the literature. Nenkov, Morrin, Schwartz, Ward and Hulland (2008) proposed three factors to characterize maximizers: alternative search, decision difficulty, and high standards. According to Diab, Gillespie and Highhouse (2008), adopting high standards alone should define maximizers. Lai (2010) argued that aspirations for high standards and a preference for extensive alternative searches were two dimensions of maximizers. Richardson, Ye, Ege, Suh and Rice (2014) proposed another three factors: decision difficulty, regret, and wanting the best. According to Cheek and Schwartz (2016) and Cheek and Goebel (2020), maximizing is best conceptualized as the goal of choosing the best through the strategy

This research was financially funded by the programs of National Natural Science Foundation of China (71771088 and 71501073).

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of alternative search. Despite the presence of various factors, aspiring to high standards is recognized as an essential characteristic of maximizers.

Given these aspirations, maximizers are willing to spend more effort to increase the possibility of achieving the best results than satisficers. For instance, maximizers preferred a good but distant commodity over a moderately good but close one more so than satisficers. In other words, maximizers were willing to walk farther to attain the better commodity (Weaver et al., 2015). Maximizers also allotted more time than satisficers to compare different alternatives and search for the best product when shopping (Chowdhury et al., 2009).

In sum, the aspiration for high standards will cultivate the maximizers' mindset and ultimately their decision-making behavior. We therefore propose that maximizing will also induce an aspiration for the best even when decisions are risky. The next question becomes the identification of the best in risky decisions.

1.2 Identifying the best in risky decisions

1.2.1 The best option

Risk is defined by the variance of outcomes (Mishra, 2014; Wang, 2002) that increases as that variance increases. For example, the option "gaining $100 with a .50 probability, otherwise gaining nothing" is riskier than the option "gaining $75 with a .50 probability, otherwise gaining $25".

Economic models assume that the expectation of an alternative identifies the best option in risky decisions (Edwards, 1954; Savage, 1954; von Neumann & Morgenstern, 1947). Expectation refers to the overall utility of an option, reflected by the probability-weighted sum of utilities of possible outcomes. The gamble with the highest expectation is normatively the best option because it offers the highest subjective utility. Therefore, we hypothesize that people tend to choose the option with the highest expectation when available options are clearly different in expectation. In this case, choices should have nothing to do with the degree of maximizing.

The evaluation of expectation partially depends on expected value (EV), which is calculated by multiplying each possible value by its probability. Although expectation evaluations do not necessarily result from calculations of EV, some studies have shown that high-EV options offer high expectations. For instance, by recording participants' real-time thoughts in risky decisions, Cokely and Kelley (2009) found that participants tended to make choices consistent with EVs, although they seldom performed EV calculations. This result suggests that people perceive a higher utility from the option clearly higher in EV than the option clearly lower in EV. Thus, it is reasonable to manipulate expectations by manipulating EVs. We hypothesize a preference for an option with a higher EV over an option with a lower EV, regardless of the degree of maximizing.

Harman, Weinhardt and Gonzalez (2018) provided initial evidence for our hypothesis. They found that participants were more likely to choose options with high EVs (and thus high expectations) than options with low EVs (and thus low expectations). This tendency was not correlated with scores on multiple maximizing scales. Furthermore, participants in Jain et al. (2013) made ten decisions. Each had a less risky option with a smaller variance (e.g., win $40 with a .30 probability, otherwise win $32) and a riskier option with a larger variance (e.g., win $77 with a .30 probability, otherwise win $2). Clearly, the two options differed in EV (and thus expectation). Consequently, maximizing was uncorrelated with risk taking, and participants, on average, were somewhat sensitive to EV (and thus expectation).

1.2.2 The best outcome

In risky decisions, the upper bound of an option identifies the best outcome because it offers the possibility of obtaining the best result. Some studies have shown that individuals who aim for the best results are sensitive to the upper bound and take more risks to seek the best outcome provided by a risky option. For instance, individuals who sought higher potential returns accepted more risks than those who preferred that some level of security be ensured (Lopes, 1987). Similarly, promotion-focused individuals who were sensitive to positive results took more risks than prevention-focused individuals who were sensitive to negative results (Zou, Scholer & Higgins, 2014).

When the available options are similar in expectation, people will turn to the upper bound to make a decision. As maximizing motivates the pursuit of the best result, we hypothesize that maximizing will be related to higher risk-taking tendencies when the best choice cannot be identified by expectation. The existing literature provides initial evidence for this hypothesis. For example, Polman (2010) asked participants to play the Iowa Gambling Task in which they chose cards one at a time from high-risk (potentially larger wins and losses) and low-risk (smaller wins and losses) decks. Participants knew nothing about the values or probabilities of either the low- or high-risk deck before they made their decisions. The results indicated stronger risk-taking tendencies for maximizers than for satisficers.

Given the above, we predict that risk taking will not be correlated with maximizing if the available options provide clearly different expectations. People tend to follow the expectations and prefer the option with the highest expectation. If different options provide similar expectations, risk-taking tendencies will increase with maximizing.

1.3 Research overview

We conducted four studies to test the relationship among expectation, maximizing, and risk-taking tendencies. Pro-

Table 1: Correlation matrix (Study 1).

Variable	*M* (*SD*)	1	2	3	4	5	6
1. Age	30.67 (10.93)	1					
2. Maximizing (three dimensions)	4.48 (1.28)	−.01	1				
3. Maximizing (two dimensions)	4.41 (1.33)	−.01	.97	1			
4. Alternative search	4.31 (1.46)	−.02	.92	.96	1		
5. Decision difficulty	4.62 (1.45)	.01	.86	.71	.65	1	
6. Highest standards	4.62 (1.44)	.01	.83	.83	.64	.67	1
7. Risk-taking tendencies	3.19 (1.10)	−.08	.63	.64	.58	.48	.59

Note: For $|r| > .47$, $p < .001$, for $|r| < .10$, $p > .10$.

vided that the expectations of two options are similar when the EVs are close (Cokely & Kelley, 2009), we manipulated expectations by EV. In Studies 1 to 3, we investigated whether risk-taking tendencies would increase with maximizing when expectations failed to identify the best option. In Study 1, the EVs of taking and not taking risks could not be specified. We therefore assumed that taking and not taking risk did not differ clearly in expectation. In Studies 2 and 3, two available options had similar expectations (reflected by EVs). We then conducted Study 4 to examine the relationship between maximizing and risk-taking tendencies when expectations (reflected by EVs) between two alternatives were either similar or clearly different.

2 Study 1: General risk-taking tendencies

In Study 1, we used the maximization scale (MS; Schwartz et al., 2002) to measure maximizing tendencies and the general risk propensity scale (GRiPS; Zhang, Highhouse & Nye, 2019) to measure general risk-taking tendencies.

2.1 Method

2.1.1 Participants

A total of 281 participants (103 men, 178 women; M_{age} = 30.67 years, *SD* = 10.93) recruited from http://wjx.com, an online survey platform, participated in the study.

2.1.2 Procedure and materials

The GRiPS (α = .95) includes eight items to assess general attitudes toward risk taking (1 = *strongly disagree*, 5 = *strongly agree*) in daily life. All items had no specified EVs (e.g., I would take a risk even if it meant I might get hurt). Thus, we assumed that on average, there was no obvious difference in expectation between taking or not taking risks. The MS (α = .91) is a 13-item scale that measures maximizing tendencies (e.g., No matter what I do, I set the highest standards for myself; 1 = *completely disagree*, 7 = *completely agree*). The MS has three dimensions: alternative search (α = .85), decision difficulty (α = .84), and high standards (α = .80). The order of the GRiPS and MS was counterbalanced across participants. Finally, the participants reported their gender and age.

2.2 Results and discussion

Although the MS has three dimensions (i.e., alternative search, decision difficulty, and high standards), a recent study suggested that decision difficulty should not be conceptualized as a component of maximizing (Cheek & Goebel, 2020). Given the inconsistent conceptualizations, we computed average scores of maximizing in two ways (with or without decision difficulty) and reported results for these two scores to provide a comprehensive understanding about the relationship between maximizing and risk-taking tendencies. We also computed average scores of the three maximizing dimensions and general risk-taking tendencies. The results showed a strong positive correlation between three-dimension maximizing and general risk-taking tendencies (r = .63, $p < .001$). The positive correlation between two-dimension maximizing and general risk-taking tendencies was also strong (r = .64, $p < .001$). The three dimensions of maximizing were all positively correlated with general risk-taking tendencies (Table 1).

Next, we labeled the participants who scored at least one *SD* higher than the mean of three-dimension maximizing as maximizers (N = 49) and those who scored at least one *SD* lower than the mean as satisficers (N = 46). We also did this according to the mean and standard deviation of two-dimension maximizing. Maximizers (N = 49) scored at least one *SD* higher than the mean, whereas satisficers (N = 48) scored at least one *SD* lower than the mean. Risk-taking tendencies for maximizers and satisficers were summarized in Table 2.

TABLE 2: Means (standard deviations) of risk-taking tendencies for maximizers and satisficers in Studies 1 to 4.

Study	Scale of risk-taking tendencies	Domain	Expectation	Maximizing (three dimensions)		Maximizing (two dimensions)	
				Maximizers	Satisficers	Maximizers	Satisficers
Study 1	5-point	—	—	4.37 (0.72)	2.18 (0.99)	4.32 (0.78)	2.29 (1.03)
Study 2	7-point	Gain	Similar	4.43 (2.46)	3.26 (2.25)	4.41 (2.61)	3.20 (2.11)
		Loss	Similar	5.21 (1.89)	4.44 (2.12)	5.16 (2.05)	4.24 (2.17)
Study 3	7-point	Gain	Similar	3.42 (1.71)	2.49 (1.39)	3.63 (1.96)	2.65 (1.46)
Study 4	7-point	Gain	Dissimilar	2.66 (1.33)	3.06 (1.60)	2.96 (1.30)	2.80 (1.41)
			Similar	3.82 (1.89)	3.06 (1.59)	3.89 (1.85)	2.88 (1.56)
		Loss	Dissimilar	3.32 (1.56)	2.94 (1.40)	3.30 (1.56)	3.22 (1.43)
			Similar	4.31 (1.43)	3.72 (1.27)	4.25 (1.60)	3.95 (1.45)

These results revealed a positive correlation between maximizing and general risk-taking tendencies. In Study 2, we examined the relationship between maximizing and risk-taking tendencies when the options had similar expectations (reflected by identical EVs).

3 Study 2: Asian disease problem

In Study 2, we used the Asian disease problem (Tversky & Kahneman, 1981) to examine the relationship between maximizing and risk-taking tendencies. Participants were provided with options with similar expectations (identical EVs). We expected maximizing to be positively correlated with risk-taking tendencies regardless of framing because the riskier options offered the possibility of obtaining the best outcome in both positive and negative framings.

3.1 Method

3.1.1 Participants

A total of 472 participants (222 men, 250 women; M_{age} = 31.80 years, SD = 7.33) recruited from http://wjx.com were randomly assigned to a positively or negatively framed decision. In addition, maximizing was measured and treated as a continuous variable.

3.1.2 Procedure and materials

The participants completed the MS (α = .80) and then read the Asian disease problem as follows:

> Imagine that your country is preparing for the outbreak of an unusual disease that is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:
>
> [Positive framing]
>
> If Program A is adopted, 200 people will be saved.
>
> If Program B is adopted, there is a 1/3 probability that 600 people will be saved, and a 2/3 probability that nobody will be saved.
>
> [Negative framing]
>
> If Program A is adopted, 400 people will die.
>
> If Program B is adopted, there is a 1/3 probability that nobody will die, and a 2/3 probability that 600 people will die.

Participants were randomly assigned to the positive or negative framing condition. The two programs in both framings had similar expectations (reflected by identical EVs of 200). The participants rated their preference (1 = *Program A*, 7 = *Program B*). Higher scores indicated higher risk-taking tendencies. Afterwards, age and gender were collected.

3.2 Results and discussion

Means, standard deviations, and correlation coefficients among variables are presented in Table 3. The results showed positive correlations between three-dimension maximizing and risk-taking tendencies (r = .14, p = .002), and between two-dimension maximizing and risk-taking tendencies (r = .11, p = .016).

We regressed preference ratings on three-dimension maximizing and framing. Maximizing and framing were entered in the first step. The model was significant ($F(2, 469)$ = 8.84, R^2 = .036, $p < .001$). Results showed a main effect for the framing (b = 0.54, $t(469)$ = 2.80, p = .005). Risk-taking tendency was higher by 0.54 units on the 7-point scale for negative framing than for positive framing. The main effect for maximizing was also significant (b = 0.32, $t(469)$ = 3.03, p = .003). For every step on the 7-point maximizing scale, the risk-taking tendencies went up by 0.32 units

Table 3: Correlation matrix (Study 2).

Variable	*M* (*SD*)	1	2	3	4	5	6
1. Age	31.80 (7.33)	1					
2. Maximizing (three dimensions)	4.55 (0.91)	−.18	1				
3. Maximizing (two dimensions)	4.59 (0.98)	−.16	.91	1			
4. Alternative search	4.47 (1.15)	−.19	.85	.93	1		
5. Decision difficulty	4.45 (1.33)	−.14	.71	.35	.34	1	
6. Highest standards	4.82 (1.16)	−.03	.61	.69	.38	.21	1
7. Risk-taking tendencies	4.44 (2.12)	.03	.14	.11	.09	.13	.10

Note: For $|r| > .15$, $p < .001$, for $|r| > .12$, $p < .01$, for $|r| > .10$, $p < .05$, for $|r| > .08$, $p < .10$.

on the 7-point scale. The interaction between maximizing and framing, entered in the second was not significant: the interaction was not correlated with risk-taking tendencies ($-0.01 < b < 0$, $-0.01 < t(468) < 0$, $p = .998$), thus indicating that the positive relationship between maximizing and risk-taking tendencies was maintained for both positive and negative framings.

We also regressed preference ratings on two-dimension maximizing and framing in the same way. In the first step, the model was significant ($F(2, 469) = 7.09$, $R^2 = .029$, $p = .001$). Results revealed a main effect for framing ($b = 0.56$, $t(469) = 2.88$, $p = .004$), with negative framing again showing a higher rating. The main effect for maximizing was also significant ($b = 0.24$, $t(469) = 2.40$, $p = .017$). In the second step, the interaction between maximizing and framing was again not significant ($b = -0.21$, $t(468) = -1.07$, $p = .287$), indicating that the positive relationship between maximizing and risk-taking tendencies was maintained for both framings.

As in Study 1, we labeled maximizers and satisficers and reported their means of risk-taking tendencies in Table 2.

With reference to the Asian disease problem, Study 2 revealed that maximizing was positively correlated with risk-taking tendencies when both available options had similar expectations.

4 Study 3: Risky choices in a consumption context

Study 2 showed a positive relationship between maximizing and risk-taking tendencies. However, an alternative explanation existed. Given the definition of risk (Mishra, 2014; Wang, 2002), a less risky option is not necessarily a sure option. For example, the option "gaining $100 with a .50 probability, otherwise gaining nothing" is riskier than the option "gaining $75 with a .50 probability, otherwise gaining $25", though both are uncertain. However, the less risky option in Study 2 was sure (without any uncertainty), whereas the riskier option was uncertain. The results could be explained as that maximizers merely sought uncertainty or that maximizers sought the best outcomes provided by riskier options. It therefore remained unclear whether the relationship between maximizing and risk seeking was caused by a desire for the best outcome or uncertainty.

To tease apart these two possibilities, we offered two uncertain options with similar expectations (reflected by identical EVs) in Study 3 where one was riskier (with a higher variance) than the other. Each option had two potential outcomes with a .50 probability. If maximizing was still related to preferences for riskier options, the explanation of uncertainty seeking would be excluded. Furthermore, risky choices in Study 3 were based in a consumption context. As the framing did not moderate the relationship between maximizing and risk-taking tendencies in Study 2, we did not consider framing.

4.1 Method

4.1.1 Participants

We recruited 325 adults from http://wjx.com and excluded 7 who took too long for completion (> 10,000s), thus yielding 318 participants (165 men, 153 women; $M_{age} = 32.23$ years, $SD = 6.73$).

4.1.2 Procedure and materials

The participants completed the MS ($\alpha = .76$) and then considered that they were in a shopping mall and had opportunities to draw for monetary vouchers. The participants made four decisions. Each decision had two approaches to draw vouchers. Both approaches were uncertain and had similar expectations (reflected by identical EVs, see Table 4). For example, if the participants chose Option A, they would win a voucher worth 40 with a .50 probability, otherwise they would win a voucher worth 60. If they chose Option B,

Table 4: Decisions in Study 3.

Decision	Expected value	Option A (Less risky)	Option B (Riskier)
1	50	[40, 60]	[0, 100]
2	100	[80, 120]	[0, 200]
3	200	[160, 240]	[0, 400]
4	400	[320, 480]	[0, 800]

Note: In [a, b], a denotes the lower bound of the variance, whereas b denotes the higher bound of the variance. The probability of reaching the higher bound was .50 in all options.

Table 5: Correlation matrix (Study 3).

Variable	*M* (*SD*)	1	2	3	4	5	6
1. Age	32.23 (6.73)	1					
2. Maximizing (three dimensions)	4.46 (0.85)	−.01	1				
3. Maximizing (two dimensions)	4.58 (0.91)	.02	.89	1			
4. Alternative search	4.46 (1.08)	.01	.84	.92	1		
5. Decision difficulty	4.18 (1.33)	−.06	.71	.31	.33	1	
6. Highest standards	4.80 (1.11)	.03	.54	.66	.32	.11	1
7. Risk-taking tendencies	2.94 (1.54)	−.07	.21	.26	.27	.05	.12

Note: For $|r| > .20$, $p < .001$, for $|r| > .10$, $p < .05$, for $|r| < .08$, $p > .10$.

they would win nothing with a .50 probability, otherwise they would win a voucher worth 100. The participants rated their preference between the two options (1 = *Option A*, 7 = *Option B*). We calculated an average preference rating of four decisions for each participant ($\alpha = .79$). A higher score indicated a higher risk-taking tendency. The four decisions were shown in a fixed random order. Gender and age were collected afterwards.

4.2 Results and discussion

Means, standard deviations, and correlation coefficients among variables are presented in Table 5. The results revealed positive correlations between three-dimension maximizing and risk-taking tendencies, $r = .21$, $p < .001$, and between two-dimension maximizing and risk-taking tendencies, $r = .26$, $p < .001$.

We labeled maximizers and satisficers as in Study 1 and reported their risk-taking tendencies in Table 2.

These results replicated the findings in Study 2 and ruled out the alternative hypothesis that maximizing was related to uncertainty seeking because maximizing was positively correlated with risk-taking tendencies when both options were uncertain.

5 Study 4: Dissimilar vs. similar expectations

Study 4 tested the relationship between maximizing and risk-taking tendencies when two options had similar or clearly different expectations (reflected by identical or different EVs). We expected that maximizing would be positively correlated with risk-taking tendencies only when options had similar expectations.

Crucial to this study was the creation of two conditions. In the dissimilar-expectation condition, the less risky option (upper bound of range: 60; lower bound of range: 40; expected value: 50; see Table 6) was higher in EV but lower in upper bound of variance than the riskier option (upper bound of variance: 70; lower bound of range: 30; expected value: 45). The probability of reaching the high bound in both options was .50. Therefore, the less risky option provided a higher expectation, whereas the riskier option potentially provided a better outcome. According to our theory, maximizing should be irrelevant with risk-taking tendencies because the expectations could identify the better option. In the similar-expectation condition, the less risky option (60) had a lower upper bound of the variance than the riskier option (70) but identical EVs (50) as the riskier option (Table 6). The probability of reaching the upper bound in both options was also .50. Thus, the two options provided similar

Table 6: Options in Study 4.

		Decision 1		Decision 2		Decision 3	
Domain	Expectation	Option A (Less risky option)	Option B (Riskier option)	Option A (Less risky option)	Option B (Riskier option)	Option A (Less risky option)	Option B (Riskier option)
Gain	Dissimilar	[40, 60]	[20, 70]	[160, 240]	[80, 280]	[320, 480]	[160, 560]
	Similar	[40, 60]	[30, 70]	[160, 240]	[120, 280]	[320, 480]	[240, 560]
Loss	Dissimilar	[−60, −40]	[−80, −30]	[−240, −160]	[−320, −120]	[−480, −320]	[−640, −240]
	Similar	[−60, −40]	[−70, −30]	[−240, −160]	[−280, −120]	[−480, −320]	[−560, −240]

Note: In [a, b], a denotes the lower bound of the variance, whereas b denotes the higher bound of the variance. The probability of reaching the higher bound was .50 in all options.

Table 7: Correlation matrix (Study 4).

Variable	*M* (*SD*)	1	2	3	4	5	6
1. Age	30.70 (9.95)	1					
2. Maximizing (three dimensions)	4.21 (0.85)	−.11	1				
3. Maximizing (two dimensions)	4.11 (0.92)	−.11	.92	1			
4. Alternative search	3.96 (1.08)	−.09	.86	.93	1		
5. Decision difficulty	4.43 (1.17)	−.06	.73	.41	.38	1	
6. Highest standards	4.41 (1.09)	−.08	.63	.68	.36	.29	1
7. Risk-taking tendencies	3.30 (1.46)	.02	.06	.05	.05	.06	.02

Note: For $|r| > .28$, $p < .001$, for $|r| > .09$, $p < .01$, for $|r| > .07$, $p < .05$, for $|r| > .06$, $p < .10$.

expectations, but the riskier option potentially provided a better outcome. We predicted a positive correlation between risk-taking tendencies and maximizing.

5.1 Method

5.1.1 Participants

A total of 915 participants were recruited from http://wjx.com and one was excluded for taking too long for completion (> 10,000s), thus remaining 914 participants (413 men, 501 women; M_{age} = 30.70 years, SD = 9.95). Participants were randomly assigned to one condition in a 2 (domain: gain vs. loss) × 2 (expectation: dissimilar vs. similar) between-subjects design. Maximizing was treated as a continuous variable.

5.1.2 Procedure and materials

Participants completed the MS (α = .76) first and then completed three risky decisions in a financial context. The participants in the gain (or loss) domain read a scenario where the stock they held had recently performed well (or poorly) and they had two options (Table 6). The three decisions differed by the magnitude of expectations and were shown in a fixed random order. After reading the scenario, the participants reported their preference (1 = *Option A*, 7 = *Option B*). A higher score indicated a higher risk-taking tendency. We averaged the preference ratings across the three decisions (α = .76). Finally, the participants provided their gender and age.

5.2 Results and discussion

Means, standard deviations, and correlation coefficients among variables are showed in Table 7.

We regressed preference ratings on three-dimension maximizing, domain, and expectation. In the first step, we entered maximizing, domain, and expectation as independent variables. The model was significant ($F(3, 910) = 21.14$, $R^2 = .065$, $p < .001$). We found a main effect for domain ($b = 0.38$, $t(910) = 4.10$, $p < .001$). The participants sought more risk in the loss (vs. gain) domain. The main effect for maximizing was not significant ($b = 0.09$, $t(910) = 1.56$, $p = .120$). The main effect for expectation was significant ($b = -0.62$, $t(910) = -6.64$, $p < .001$). Similar expectations

were related to higher risk-taking tendencies than dissimilar expectations.

In the second step, we entered the two-way interactions between the independent variables. The interaction between maximizing and the domain was not significant (b = 0.06, $t(907)$ = 0.57, p = .571), and the interaction between the domain and expectation was not significant (b = 0.01, $t(907)$ = 0.06, p = .957). Of great interest to us, an interaction between maximizing and expectation was found (b = −0.24, $t(907)$ = −2.19, p = .029). Risk-taking tendencies increased with maximizing when expectations were similar (b = 0.22, $t(409)$ = 2.49, p = .013, R^2 = .015). However, this trend disappeared when the expectations clearly differed (b = −0.01, $t(501)$ = −0.17, p = .869).

In the third step, we entered the three-way interaction among maximizing, domain, and expectation. The three-way interaction was not significant (b = −0.05, $t(906)$ = −0.20, p = .842), thus indicating that the two-way interaction between maximizing and expectation existed regardless of the domain.

We also conducted a similar regression for two-dimension maximizing. In the first step, the model was significant ($F(3, 910)$ = 20.94, R^2 = .065, p < .001). The main effect for the domain was significant (b = 0.39, $t(910)$ = 4.12, p < .001). The participants sought more risk in the loss (vs. gain) domain. The main effect for maximizing was not significant (b = 0.07, $t(910)$ = 1.37, p = .172). The main effect for expectation was significant (b = −0.63, $t(910)$ = −6.68, p < .001). Similar expectations were related to higher risk-taking tendencies than dissimilar expectations.

In the second step, the interaction between maximizing and the domain was not significant (b = −0.13, $t(907)$ = −1.27, p = .205), and the interaction between the domain and expectation was not significant (b = −0.01, $t(907)$ = −0.03, p = .975). Inconsistent with our hypothesis, the interaction between maximizing and expectation was also not significant (b = −0.10, $t(907)$ = −0.92, p = .360). (In addition, the decision-difficulty dimension alone did show the expected interaction [b = −0.24, $t(907)$ = −2.99, p = .003], and the expected effect on preference ratings in the similar-expectation condition [b = 0.21, $t(409)$ = 3.32, p = .001, R^2 = .026].)

In the third step, the three-way interaction among maximizing, domain, and expectation was not significant (b = 0.11, $t(906)$ = 0.53, p = .599).

We labeled maximizers and satisficers as in Study 1 and reported their risk-taking tendencies in Table 2.

In general, these results showed that people favored the option clearly higher in expectation in the condition of dissimilar-expectation. Nevertheless, when options had similar expectations, maximizing encouraged searches for the upper bound and was positively correlated with risk-taking tendencies. Note that these results appeared only for three-dimension maximizing. When excluding decision difficulty from maximizing, we did not find the interaction effect between maximizing and expectation on risk-taking tendencies.

6 General discussion

The present study provides insight into the relation between maximizing and risk-taking tendencies. We propose that the association between these two variables is not straightforward. It depends on expectation. When expectations help determine the best option (i.e., options have clearly different expectations), individuals base their decisions on expectations and prefer the option with the highest expectation, regardless of maximizing tendencies. In contrast, when expectations fail to determine the best option (i.e., options have similar expectations), maximizing is positively related to risk-taking tendencies given the higher possibility of satisfying the maximizing goal by selecting riskier options.

6.1 Maximizing and risk taking

This study contributes to the field by addressing what the best choice is in risky decisions and when the goal of seeking the best applies to expectations or outcomes. Maximizers pursue both the best option (identified by expectation) and the best outcome (identified by the upper bound of an option). When options clearly differ in expectation, maximizers prefer the option with the highest expectation. However, when options have similar expectations, maximizers take risks and prefer the option that offers the highest upper bound.

Previous research has revealed that maximizers pay less attention to feasibility than satisficers, whereas they pay equal attention to desirability (Luan & Li, 2017). Desirability refers to the value of an event's end state, whereas feasibility refers to the ease of reaching that value (Liberman & Trope, 1998). In risky decisions, value reflects desirability, whereas probability reflects feasibility (Sagristano, Trope & Liberman, 2002). The finding by Luan and Li (2017) appears inconsistent with our result that maximizing is related to a desire for the highest value when options have similar expectations. However, obvious differences exist between the two studies. The desirable option (e.g., a desirable concert ticket) was sure in Luan and Li (2017). As long as participants were willing to sacrifice feasibility (e.g., money paid for the concert ticket), they would achieve this desirable option for certain. Thus, the results in Luan and Li (2017) indicate that maximizers and satisficers paid equal attention to certain desirability. In contrast, desirability (e.g., the best outcome) in our risky decisions was uncertain. Even if participants were willing to sacrifice feasibility (e.g., the probability of attaining the best outcome), they would not necessarily achieve desirability. Our results implied that uncertain desirability attracted maximizers more than satisficers. Similar to our study, Hsieh and Yalch (2019) found that maximizers were

more likely to choose high-risk, high-reward options than satisficers, indicating that maximizers paid more attention to uncertain desirability than satisfices.

Our findings also provide a possible explanation for the inconsistent relationship between maximizing and risk-taking tendencies in the literature. In previous studies that found no difference in risk taking between maximizers and satisficers, the options had clearly different EVs (Jain et al., 2013). Thus, people favored the options that were higher in expectation. In studies that found that maximizing was positively correlated with risk seeking, expectations failed to identify the best option. For example, in the Iowa Gambling Task in Polman (2010), participants knew little about the potential values and their probabilities of high- and low-risk decks before they selected a card. These inconsistent findings are partially explained by our theory. An exception is the finding by Lai (2010) that found no correlation between maximizing and risk-taking tendencies. We speculate that this exception was caused by the items measuring risk-taking tendencies, for example, "I am the kind of person who would try any new product once." The items may have reflected unfamiliarity seeking more than risk seeking.

6.2 Conceptualization of maximizing

This study also illuminates the conceptualization of maximizing. In the maximization scale developed by Schwartz et al. (2002), maximizing is conceptualized by alternative search, decision difficulty, and high standards (Nenkov et al., 2008). However, some studies suggest that decision difficulty is not a component of maximizing because maximizers do not necessarily experience decision difficulty unless in complex decisions (Cheek & Schwartz, 2016). In addition, decision difficulty shows a divergent pattern of correlations with related variables (e.g., regret) from alternative search and high standards (Cheek & Goebel, 2020), and is, in any case, a possible effect of maximization rather than part of its definition.

In the current research, the correlations between alternative search and risk-taking tendencies and between high standards and risk-taking tendencies seem to be more robust than the correlation between decision difficulty and risk-taking tendencies in Studies 1 to 3 (see Tables 1, 3, and 5). However, excluding decision difficulty from maximizing changes the interaction effect between maximizing and expectation on risk-taking tendencies in Study 4. This result casts some doubt on the explanation of Studies 1–3 solely in terms of high-standards referring to outcomes rather than expectations. The nature of the relation between decision difficulty and risk taking needs further exploration.

6.3 Limitations and future directions

Our study is correlational in nature as maximizing was measured rather than manipulated, thereby hindering the investigation of causality between maximizing and risk-taking tendencies. Therefore, we call for research to manipulate maximizing to examine the causal relationship. Another concern is that this research did not test risk taking in an incentivized setting. Future research may well ask participants to make real decisions.

We found that maximizing was positively associated with general risk-taking tendencies (Study 1) as well as risk seeking in public health (Study 2) and financial (Study 3 and, three-dimensions only, Study 4) domains. Future research may ask whether our findings can be extended into other risk domains, such as ethical and recreational domains. According to our theory, the domain is not a crucial factor that influences the relationship between maximizing and risk-taking tendencies.

Another direction for further studies is to relate our findings to the maximization paradox that maximizers achieve better outcomes but feel worse than satisficers (Iyengar et al., 2006). In our research, maximizing is correlated with preferences for riskier (vs. less risky) options that bring about the best or worst outcomes. If maximizers get the best outcome, how will they feel? Ma and Roese (2014) showed that maximizers did not experience more regret than satisficers when they obtained the best outcome. Conversely, if maximizers get the worst outcome in a risky decision, how will they feel? Existing literature cannot provide an answer; therefore, further investigation is necessary.

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