# Do people trust more when they are happy or when they are sad? Evidence from an experiment

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# Abstract: This paper deals with the role played by incidental emotions on trust decisions. Based on a laboratory experiment with monetary incentives, we explore the way positive and negative emotions impact transfers in a trust game, in addition, we investigate the mechanism through which risk intervene in the relationship between emotions and trust. Our results suggest that only positive emotions influence trust, then risk comes to cancel this effect. Furthermore, we found that transfer in the trust game is driven by other-regarding preferences and by risk preferences.

*Keywords: Emotions, Trust game, Dictator game, Risk aversion, Experiment*

JEL classification numbers: C91

# 1. Introduction

While standard economic models assume that individual risk preferences are stable across time and across situations with similar expected payoffs (Stigler and Becker, 1977), recent literature suggests that risk preferences are less constant than presumed by economic theory and this instability, while attributed by some scholars to errors, is associated to sensitivity to incidental emotions (Fehr-Duda et al., 2011). Our experimental study aims to shed light on this topic having a central objective to enrich substantially the paradigm for research on incidental emotions and risky choice. Using a trust game, we intend to investigate the influence of incidental emotions on risky interactive decisions (i.e., decisions in which each party’s outcome depends in part on the other party’s choice). Precisely, our research aims to investigate the relationship between emotions, risk and trust. We intend to discover the mechanism through which risk intervene in the relationship between emotions and trust.

Our experimental protocol proposes a between-subjects designincluding the following steps: first, emotion induction based on the International Affective Picture System (IAPS; Lang et al., 2005)); followed by the assessment of the participants' emotional state through the SAM scale (Bradley et Lang, 1994); second, we implement a modified version of the BDM trust game (Berg, Dickhaut, and McCabe (1995)), a dictator game, a risk & ambiguity game (Fox and Tversky, 1995); and finally, participants fill in a post-experiment questionnaire (questions designed to measure: trust & altruism (Wrightsman, 1991), perspective taking (Selman, 1980) and to indicate socio-demographic characteristics).

Results indicate that positive emotions, but not negative ones, influence decisions towards trust. Indeed, participants, in whom positives emotions are induced, exhibit less trust than others. In a later stage, specifically when subjects are exposed to the risky option, results show that risk cancels the effect of emotions and subjects seem to be immunized against incidental affect. Secondly, risk preferences are found to be unstable across treatments, actually risk takers in the positive condition are less willing to trust than others. In the same context, it is to note that risk preferences are found to influence trust decisions. Finally, the claim that altruism might play a significant role in first mover transfers (Smith, 2003; Cox, 2004) is confirmed and trusting was found to be partly affected by altruism.

# 2. Experimental design

### The Trust game and the Dictator game

### Based on the BDM trust game (Berg et al., 1995), we designed two different versions: a "Safe” and a “Risky” version. However, because the sender's transfer, in the trust game, may be explained not only by expectations of positive return, but rather by social preferences such as altruism, we used the dictator game to control how altruism may impact transfers in the trust game.

In both games, two players, player A and player B, share 5 dinars. In the **Safe treatment** (Trust game / Dictator game), A send an amount of x dinars[[4]](#footnote-4), this amount is doubled and assigned to B. In the Safe dictator game *2x* belong to B. The monetary payoffs for A and B are respectively *5-x* and *2x*. In the Safe trust game, B can return a positive amount *r ≤ 2x* to A. The monetary payoffs for A and B are respectively *5 − x + r (x)* and2*x* − *r (x).* In the **Risky treatment**, A send an amount of x dinars, this amount is multiplied by 3 with a probability of 50% and multiplied by 1 with the counter probability and assigned to B. In the Risky dictator game *x* or *3x* belong to B. The monetary payoffs for A and B are respectively *5-x* and *x* or *3x*. In the Risky trust game, B can return a positive amount *r ≤ 2x* to A. The monetary payoffs for A and B are respectively *5 − x + r (x)* and *x* − *r (x)* or 3*x* − *r (x)*.

### Emotion induction and assessment

Using slideshow pictures that are selected from the International Affective Picture System (IAPS, Lang et al., 1988), the emotional state of participants was manipulated at different points during the experiment. A first induction was made at the beginning of the session by exposing participants to a slideshow of pictures for each treatment except the control treatment. During the experiment, and before decisions in the different parts of the experiment, a quick exposition of the slideshows was made to remind the participants of the felt emotion. To measure the participants' emotions, we used the Self-Assessment Manikin (SAM)[[5]](#footnote-5) (Lang, 1980).

We also queried participants about their preferences over trust and altruism, their expectations and their stated generosity in order to compare actual behavior in the trust game (the dictator game) to these variables and to examine how individuals actually behave facing a trust decision (dictator decision) as opposed to how they say they will act. Additionally, because trust decision involves an endogenous uncertainty about the trustee’s behavior (ambiguity), It is found suitable to measure this ambiguous component using the Ellsberg urn (Hogarth and Villeval, 2010; Fox and Tversky, 1995).

In October 2016, the experiment was conducted at the University of Sousse (Tunisia) with 360 business and economics undergraduate students, split into 18 sessions of 20 students, recruited and anonymously paired upon the usual procedures in a between design. The experiment was conducted using the pen and paper procedure. Each session lasted approximately 50 minutes including the reading of the instructions. On average, subjects earned 9 TND.

# 3. Data analysis: results and interpretation

Most of the subjects (71 %) are women[[6]](#footnote-6). The most frequent age and income interval are respectively 20 years and (50 and 100 DT) [Table 1]. One hundred and eighty of the 360 subjects (50%) assigned to the sender role in the trust game and passed a positive amount[[7]](#footnote-7) to their randomly assigned anonymously counterparts. After watching the slideshow, subjects were asked to self-report their emotional state using the Self-Assessment Manikin (SAM) on the dimensions: valence, dominance and arousal using a 9-point scale [Table 1].

|  |  |  |  |
| --- | --- | --- | --- |
| Emotions | Valence | Arousal | Control |
| Neutral | 6.533(0.189) | 3.8 (0.259) | 6.8 (0.209) |
| Negative | 2.85 (0.201) | 5.333(0.274) | 6.316 (0.292) |
| Positive | 6.817 (0.196) | 4.167(0.251) | 6.35 (0.273) |

**Table 1. Mean change in the emotional state after emotions induction**

The mean for the negative affect scale (M=2.85) is significantly lower than the positive affect scale (M=6.817) as well as the neutral scale (M=6.533). However, the mean for positive scale is not significantly different from the neutral scale. These results indicate that subjects might have come to the experiment with preexistent positive emotions. However, in sum we presume that the emotion manipulation was effective since the arousal level of participants in the positive condition is higher, also the Kruskal–Wallis test (K-W hereafter) confirm that the distribution across treatment was significantly different (Chi2 = 99.502; Dof = 2; p = 0.0001).

**3.2 The influence of emotions on Risk attitudes**

Our participants are overwhelmingly ambiguity avoider (60 %), 15 % are ambiguity neutral and 25 % are ambiguity seeker. We confirm previous observations (see Camerer & Weber, 1992; Dominiak et al., 2012) that most people are ambiguity averse in this decision task. Coming now to risk attitudes, results show an almost similar distribution as ambiguity preferences: risk averse subjects represent the highest proportion in the sample (48%) compared to only 40% of risk prone and 12% of risk neutral. The distribution of risk and ambiguity preferences is similar across the treatments which makes the comparison between treatments viable (respectively Chi2 = 4.282, Dof = 2, p = 0.117; Chi2 = 0.058, Dof = 2, p = 0.9714). It is to note results come to contradict the economic theory by reconfirming the idea of risk preferences’ instability (e.g. Hey and Orme, 1994; Fehr-Duda et al., 2011) in the sense that subjects are found to behave differently when opposed to the same decision tasks under different emotional states. It is found that the percentage of subjects with preference switches is considerably substantial (Hey and Orme, 1994). Individuals in the negative condition are found to be more likely to be risk averse than the positive condition. This pattern is consistent with the Affect Infusion Model (AIM) (Forgas 1995) which proposes that positive affect increases the tendency to take risks while negative affect reduces risk-taking (e.g., Finucane et al., 2000; Au et al., 2003; Grable and Roszkowski, 2008; Johnson and Tversky, 1983; Kamstra et al., 2003; Hirshleifer and Shumway, 2003; Leith and Baumeister, 1996; Levy and Galili, 2008; Yuen and Lee, 2003), actually individuals in a positive emotional state are found to consider positive cues in making judgments and thus risks are perceived to be lower under positive moods than under negative moods (Johnson and Tversky, 1983; Wright and Bower, 1992). Consequently, individuals are more likely to think about the positive aspects of risky situations than those in a negative mood.

**3.3 The influence of emotions and risk on Trust**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Safe treatment* | | *Risky treatment* | |
| Trust | *Giving* | Trust | *Giving* |
| *Neutral emotion* | 1.983 (1.070) | 1.566 (1.215) | 1.983 (1.380) | 1.583 (1.661) |
| *Negative emotion* | 1.866 (1.105) | 1.366 (1.016) | 1.983 (1.094) | 1.133 (1.332) |
| *Positive emotion* | 1.483 (0.865) | 1.366 (1.413) | 2 (0.798) | 0.95 (0.723) |

**Table. 2 Means & SD. of transfers in the Trust game &Dictator game**

In the safe trust game, the average level of transfer in the positive condition is the lowest (M = 1.483) compared to the neutral and the negative conditions (vs. 1.366 in the dictator game). In sum, emotions, in the safe treatment, impact trust (t = 1.988; dof= 58; p-value = 0.051) but not generosity. In the risky trust game, the average level of transfer across the three experimental conditions is not significantly different compared to a decreasing level in the risky Dictator game going from 1.583 in the neutral treatment to 0.95 in the positive treatment (t = -1.914; dof = 58; p-value = 0.0605) [Table 2]. Risk is found to decrease generosity actually this finding confirm Brock et al.’s (2013) work who asserts that contributions tend to be lower in the tasks involving risk than in the standard dictator game.

To provide additional evidence on the relationship between emotions and trust and the way risk intervene in this mechanism we conducted a Tobit regression.

|  |  |  |  |
| --- | --- | --- | --- |
| Trust | MI | MII | M III |
| Positive emotions (1) | -0.1140675 | -0.4307657 \*\* | -0.4665748 \*\*\* |
| *Risky treatment* (2) | 0.2846499\*\* | 0.0688706 | - |
| Interaction variable (1\*2) | - | 0.6330675\*\* | 0.7017601 \*\*\* |
| Risk taking (3) | -0.2737249\* | -0.2707615\* | -0.2655709\* |
| Giving (dictator game) | 0.3643941\*\*\* | 0.3674643 \*\*\* | 0.3654428 \*\*\* |
| Stated trust | 1.977024\*\*\* | 1.943567 | 1.948808\*\*\* |
| Role-taking task | -0.8472222 | -0.6859791 | -0.6556877 |
| Constant | 0.8879363\*\*\* | 0.947343 \*\*\* | 0.969976 \*\*\* |
| Number of observations = 180 | LR chi2 (6)= 55.91  Prob>chi2= 0.0000  Pseudo R2= 0.1004 | LR chi2 (7)= 60.04  Prob>chi2= 0.0000  Pseudo R2= 0.1079 | LR chi2 (7)= 59.89  Prob>chi2= 0.000000  Pseudo R2= 0.1076 |

∗ Statistically significant at the 10% level; ∗∗ Statistically significant at the 5% level; ∗∗∗ Statistically significant at the 1% level**.**

**Table7. Tobit regression**

In Table 7 we report the results of three models that are globally significant at the level of 1%. We find that only positive emotions impact trust. In Model I, we detect a negative but not statistically significant impact of positive emotions on trust but a positive impact of risk is considered. In Model II, we introduced an interaction term Risk \* Positive emotion and results reveal a negative relationship between positive emotions and trust moderated by risk, indeed, risk seems to influence the way positive emotions impact trust. In Model III, we eliminate the variable “risk” since it is no longer significant.

4. Discussion and concluding remarks

Our objective in this study is to assess the effect of emotional states on trust and to explore the impact of risk on this relationship. The experiment showed that only positive emotions decrease trust while we found no evidence of relationship between neutral and negative emotions and trust. Additionally, results assert that emotions influence risk preferences. Indeed, people under positives emotions are found to be more risk taker. Also, our research is consistent with other studies suggesting that the decision to trust is driven by other regarding preferences.

The evidence that only positive emotions decrease trust and that there is no impact of negative emotions on this decision is explained by the tendency of individuals with a positive emotional state to maintain their current affective state and, consequently, they avoid risky decisions and opt to more conservative ones (Isen & Patrick, 1983). This behavior is explained by person’s tendency to maintain an internal stability, indeed, Antonio Damasio (1994 p. 179) notes that “the internal preference system is inherently biased to avoid pain, seek potential pleasure, and it is probably pretuned for achieving these goals in social situations”. In the risky treatment, results show that there is no significant difference between emotional states and subjects seems to not take their emotions into account when facing risky options.

While previous researches investigating the impact of risk preferences on trust have found no relationship between these two constructs (Eckel &Wilson, 2004; Ashraf et al., 2006; Garapin et al., 2015), our results generally suggest that risk takers are found to exhibit less trust. This finding may be explained, in the first place, by the role played by emotions. This result is explained by the fact that the feeling of optimism generated by positive affect may become less relevant to the decision maker who become more focused on avoiding potential losses rather than anything else (Nygren et al., 1996).

Another explanation is the use of a test based on risky financial decisions that is presumed to better correlate with trust decisions (Garapin et al., 2015), also previous researches have used different approaches to operationalize risk, indeed, some studies (eg. Snijders and Keren, 1999; Ben Ner and Putterman, 2001; Schechter, 2007; Lönnqvist et al., 2011) considered the trust game as a measure of the willingness to take risk and considered transfer as a risky decision assuming that predispositions toward risk is able to predict when individuals will choose to trust and when they will not. In this case trusting decisions occur in environments of strategic uncertainty, where another person’s decision affects one’s own outcome, thus risk taking could be influenced by the trustor's expectations of trustworthiness. Other investigations (eg. Ashraf et al., 2003, Eckel and Wilson, 2004 and Bohnet & Zeckhauser, 2004) removed the instrument used to measure risk from the trust decision and choose to use choices between lotteries, assuming that the "typical choice task in a risky decision experiment does not involve a second person". However, the games used are different from the trust game, and so may mislead direct comparison.

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4. Participants were given the options x to be 0; 0.5; 1; 1.5; 2; 2.5; 3; 2.5; 3; 3.5; 4; 4.5; 5 dinars. [↑](#footnote-ref-4)
5. The SAM is a non-verbal pictorial assessment technique that directly measures the pleasure, arousal, and dominance associated with a person’s affective reaction to a wide variety of stimuli (Lang PJ, 1980). [↑](#footnote-ref-5)
6. It is to note that the sample was randomly selected and reflect the real distribution of the population (the number of female students is remarkably superior to the number of male students) [↑](#footnote-ref-6)
7. Except five subjects who choose to opt out (not invest). [↑](#footnote-ref-7)