Tipsters: Promoting Trust in Online Tip Sharing Platforms

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ABSTRACT

There are several mechanisms used to promote trust in online environments. We used a trust game with three reputation conditions (positive, negative and missing) and three video conditions (trustworthy, untrustworthy and missing) in a 3 x 3 within-subject design to measure the impact of seller videos and reputations scores on promoting trust. Buyers decided whether or not to buy an item from the seller and rated the trust on the seller. Reputation and videos had a significant main effect on buyers' trust and purchase decisions. Positive reputation and trustworthy videos contributed to higher purchase rates and buyers' trust. Trustworthy videos led to higher purchase rates and trust ratings than positive reputation and other video conditions even if they had a better reputation score.

KEYWORDS

Trust, Online trust, Reputation, Seller Video

1 INTRODUCTION

The amount of exchanges of services through online platforms has been increasing. Some of this exchanges occur with people that we do not know in person. Several online platforms connect people that offers some type of service with people that are searching for those services. An example of this type of platform is Airbnb[1], that enables users to rent their own houses to other users of the platform. In some cases guests and hosts share the house, even without knowing each other, other than the data provided by the platform.

Problem

It is difficult to build trust among users in online environments. In peer to peer platforms, where users are not familiar with each other, it is crucial to build trust among users. It is fundamental to give perception that a user has the skills and competences that other users value. Building trust in online communities and social networks is challenging due to the very limited exchange of interpersonal cues.

[1]https://www.airbnb.pt/

Approach

This work addresses the problem of building trust among users in an online environment. In a platform where transactions occur between users, reputation scores are the main mechanism to build trust. In an online environment where users are not familiar with each other, providing social cues of the users are important to promote trust among them. An example of a social cue is to expose the face through a profile picture. While reputation scores provide logical reasons to trust or distrust in other party (cognitive trust), these social cues induce affective responses (emotional trust).

Our work focused on understanding the effects of sharing video-based social cues and reputation scores in building trust. Little is known about the impact of these two mechanisms (reputations scores and video) when co-occurring. We performed an experiment that combines three video conditions (trustworthy video, untrustworthy video and missing video) with three reputation conditions (positive reputation, negative reputation and missing reputation) in a 3 * 3 within-subject design in a standard trust game

Contributions

The contributions of this work are:

- **Review of related work on building trust on online environments**. Many studies were already conducted in order to determine techniques that would increase the trust of a user in an online context. One relevant study was conducted by Bente et al. [2] that combined the effects of reputation scores and seller photos using a computer-mediated trust game. The structure of our study is based on this work.
- **Study on the effect of videos and reputation scores on trust.** Bente et al. [2] limited their research to a specific social cue: photos. It is unclear whether a richer media source, such as videos, will have a greater impact on sellers trustworthiness. Thus, we extend previous research by studying the effect of video-based social cues and reputation scores in promoting trust.

Document structure

The rest of the report is organized as follows. In Section 2 we present the background related with our work and its

respective discussion. Section 3 describes the approach and procedures of the experiment we conducted to measure the impact of reputation scores and video-based social cues when co occurring in online transactions, while section 4 presents the results obtained. Finally, section 5 concludes the report.

2 RELATED WORK

In this section we will make an overview of the related work. We will begin by analyzing the key concepts of trust. The concepts of trust will be further analyzed in an online context, where we will detail the antecedents of online trust and some mechanisms studied to promote trust.

Trust

Trust is needed when people feel vulnerable and are in an environment that is uncertain and risky[15]. Trust is an essential factor in many kinds of human interactions, allowing people to act under uncertainty and with the risk of negative consequences[9].

Affect-based trust: Affect-based trust (also called emotional trust) develops from one's instincts, intuition, or feelings concerning whether an individual, group or organization is trustworthy [12]. In online environments, visual attractiveness or social cues such as human images can be used to induce affective responses which may result in favorable attitudes toward the site [6].

Cognition-based trust: Cognition-based trust is defined as a consumer's rational expectation that an online vendor has the necessary attributes to be reliable [11]. The trustor's choice is motivated by a conscious calculation of advantages. Quality information on a website can help potential customers make rational purchasing decisions [10].

Trust in an online context. Users may feel insecure when visiting a website or application, especially if it involves online transactions. Trust plays a crucial role in human-computer interaction due to the high complexity and anonymity associated with e-commerce [16]. The lack of trust towards web vendors is one of the main factors discouraging consumers to engage in online shopping [1].

Influence of seller's reputation on trust

Reputation systems are one of the most important mechanism to build consumer trust in e-commerce. Reputation scores constitute a very influential factor in online transactions, since reputation and trust are closely related [5]. The reputation of the trustee is the accumulated experience of parties that have been engaged in transactions with the trustee. Reputation systems provide information about the past behavior of a transaction partner and are expected to build a rational basis for trust (cognitive trust) [5]. Reputation scores significantly affect purchase behavior of a consumer in online transactions. Positive reputation lead to higher purchase rates than negative and missing reputation [3]. Resnick and Zeckhauser [14] found that eBay sellers with better reputations are more likely to enjoy a boost in sales, but not in price, than their counterparts with less good reputations.

Influence of seller's photograph on trust

Photos are another central feedback for trust in e-commerce. The effects of photos on trust are more subjective than the effects of reputation. The effects of tacit social cues conveyed in a photo are more likely to impact our feelings and intuitive judgments of a seller's trustworthiness (emotional trust) [2].

Ert et al. [8] conducted an empirical analysis of Airbnb's data and a controlled experiment and found that the more trustworthy the host is perceived to be from his photo, the higher the price of the listing and the probability of its being chosen.

Xiaolan Yang [18] studied the role of photographs in online peer-to-peer lending behavior. The lending amount was higher for advertisements with a photograph rated trustworthy than for a photograph rated untrustworthy, and higher for advertisements with a photograph rated happy than for a photograph rated sad.

Combining seller photos and reputation

Bente et al. conducted a study [2] that combined the effects of reputation and seller photos, using a computer-mediated standard trust game that combined three photo conditions (trustworthy, untrustworthy and no seller photo) with three reputation conditions (positive, negative and no seller reputation) in a 3x3 within-subject design. In the trust game, participants assume the role of buyers and decides whether or not to buy an item of the seller and rated the trust they have on the seller.

The main results of the experiment conducted by Bente et al.[2] are presented in figure 1. Bente et al. [2] reported that positive reputation contributed toward buyers' trust and higher purchase rates while missing reputation performed worse than negative reputation. They also found that trustworthy photographs of sellers contributed toward buyers' trust and higher purchase rates, revealing the potential that exposing a photo online has to foster trust and cooperative behavior in online transactions. Missing reputation led to significantly lower purchase rates than negative reputation.

Influence of video

Video is a rich communication setting that provides significant amounts of sensory information to viewers, since it attracts viewers' attention, engages them, and heightens their awareness of the physical presence and characteristics of a communicator.

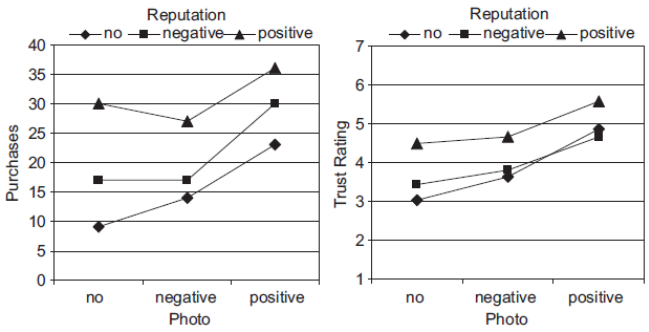

Figure 1: Effects of reputation and photos on purchase decisions and trust ratings [2]

There has been a continuously development of techniques to virtually communicate over long distances in a way almost indistinguishable from face-to-face communication. For example, videoconferencing systems are increasingly used for tasks that demand reliable, high quality communication support. Videoconferencing has an effect on the ability of the subjects to gain a clear and detailed picture of the person at the other end [13].

Many e-commerce websites give users a chance to review the products purchased in the website in order to build trust of new users. Increasingly more websites are providing a way to the costumers to upload video-based reviews. Video-based reviews are richer in color, realistic visual cues and dynamic movements and have a powerful impact on consumer perceptions and their intentions to purchase [17].

Discussion

Several studies [2, 3, 5, 7, 18] have been conducted in order to understand how trust can be built in online environments. Researchers distinguished two key concepts of trust: cognitive trust and emotional trust. Cognitive trust provides logical reasons to trust or distrust in other party. Reputation scores are the central feedback mechanism used to establish a base of trust among the users, providing these rational reasons. Emotional trust induce affective responses in the trustor. For example, providing social cues in an online context, such as a profile picture, can be used to mitigate the anonymity between users, and thus influencing the process of building trust among the users.

The impact of using reputations scores and social cues in online transactions when these two mechanisms co-occur has already been studied. Bente et al. conducted a study [2] that combined the use of reputations scores and social cues (photos) to promote trust in online transactions. The use of video as a social cue has been studied in different contexts, such as videoconferencing [13]. However, there have not been made many studies regarding the influence of video in online commerce, namely in C2C commerce, and, to the best of our knowledge, no empirical study has combined the effect of video and reputation scores in those environments. Thus, we extended previous research by studying the effect of video-based social cues and reputation scores on promoting trust in online transactions.

3 METHOD

Our work addresses the problem of building trust among users in an online environment. We conducted a study to understand the effects of videos and reputation scores when co-occurring in online transactions. In this section we describe the specifications of the study.

Study Design

To understand the impact of videos and reputation scores on trust and purchase behavior in online transactions, we used a standard trust game to combine three video conditions (trustworthy video, untrustworthy video and missing video) with three reputation conditions (positive reputation, negative reputation and missing reputation) in a 3 * 3 within-subject design. Bente et al.[2] combined effects of a profile photo and reputations scores of a seller in online transactions using a standard trust game. We proposed to extend this experiment by using a richer media source (videos) as the mechanism to stimulate emotional trust of the buyer. Following Bente et. al experiment, we also used a standard trust game in our study. We consider the hypothesis of using a more specific domain for the experiment, but there may be other cues that influence the perception of trust. In order to measure the impact of the mechanisms in study, it is important to reduce the complexity of these mechanisms. We considered that would be more appropriate to use the standard trust game to isolate the effects of both cognitive and emotional trust.

Standard trust game. In section 2 we briefly described the standard trust game used in Bente et al.[2] experiment. However in this section we will review and make a more detailed description of what consists this standard trust game. The trust game used was designed by Bolton et al. [4], and is presented in figure 2.

The trust game involves online transactions under monetary risk. There are two parties involved in this trust game: a seller (trustee) and a buyer (trustor). This game models a trust situation where the buyer and the seller will be involved in a sales transaction. There are not actually real products being exchanged, only its monetary equivalents. Initially both parties, seller and buyer, are endowed with 35 units. The seller will offer an item for sale at a price of 35 units. At this moment, the buyer must take the decision whether to buy or not the item from the seller. When no trade occurs they both remain with 35 units. If the buyer decides to buy

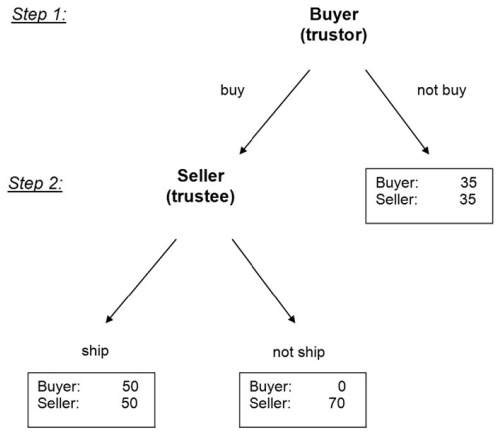

Figure 2: Standard trust game used in Bente et al.[2] experiment

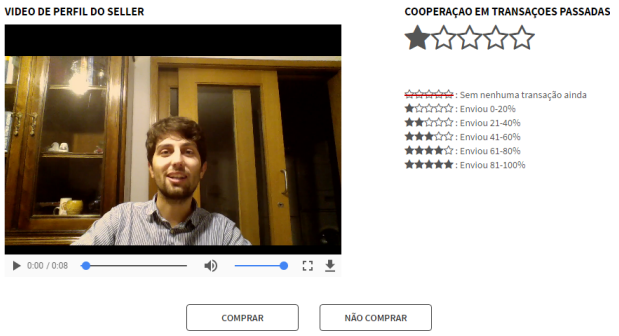

Figure 3: Study application screenshot

the item, the seller will then make the decision to ship or to do not ship the item, resulting in the following scenarios:

- Seller ships the item: The seller receives 35 units (item price) at a cost of 20 units (costs of shipping the product), ending up with 50 units. The buyer receives 50 units (for the buyer the item has a value of 50 units). Thus, each trade where the seller and the buyer decide to cooperate they both have 15 units of profit, now owning 50 units each, instead of the 35 units when no trade occurs.
- Seller does not ship the item: The seller receives the 35 units sent by the buyer plus his initial endowment, ending up with a total of 70 units. The buyer loses his initial endowment ending up with 0 units.

Study application. We developed a web application to run the trust game and to collect and store the data from the participants. The application has full control over the 3 * 3 study matrix, presenting the profile video and the reputation score of the seller for each entry of the matrix. The order in which each entry is presented is randomly assigned. The application also prompts for buying decisions and trust ratings and stores the responses in the server. The interface of the application is presented in figure 3.

Pretests

To select appropriate seller videos for the trust game we conducted a pretest. The appropriate reputations scores were reused from the pretests made by Bente et al.[2]. These pretests are useful to avoid the selection of videos or reputation scores that produce extreme trust or distrust. The goals is to select items that provide moderate levels of trust and distrust.

Reputation scores. The appropriate reputations scores were reused from the pretests conducted by Bente et al.[2]. The reputations scores used in the pretests were presented in a commonly used five-star-index. Each of the five star corresponded to a percentage of previous trades in which the seller shipped the product after the buyer decided to buy the item: (1 star - 0-20%, 2 stars - 21-40%, 3 stars - 41-60%, 4 stars - 61-80%, 5 stars - 81-100%). Thirty users rated their trust ratings for each star on a 7-point-scale, where 1 represented high distrust, 7 high trust, with 4 representing the neutral scale mean. Bente et al.[2] reported that it was appropriate to use three stars for moderate distrust (average trust rating = 2.9; SD=1.3) and four stars for moderate trust (average trust rating = 5.03; SD=1.22). They conducted a t-test comparison of these two trust ratings which revealed a significant difference ($t(29)=8.95$; $p < 0.001$, $d=1.7$).

Videos. We gathered a set of 21 videos for the pretest, from family members and friends. These volunteers where asked to record a short video in which they introduce themselves, providing their name, age, local of residence and two hobbies. From the set of volunteers, some where asked to act in a way that would generate distrust. For instance, they were told neither to look directly at the camera nor smile. The pretest had the goal of selecting 6 videos: 3 trustworthy and 3 untrustworthy. For each video category (trustworthy/untrustworthy) the videos had to have a similar trustworthiness ratings, with no statically significant difference. Furthermore, the videos should have a low standard deviation.

The pretest to determine the appropriate seller videos took place at Instituto Superior Técnico. The test was conducted by a set of 15 students (9 men and 6 Women) with an average age of 19.867 years with a standard deviation of 1.727. In this pretest the collected videos were presented to the participants. The participants rated their trust ratintgs in 21 persons based on their profile video using a 7 point scale.

The three selected trustworthy videos scored the values of M = 5.467 (SD = 0.916), M = 5.333 (SD = 0.976), M = 5.200 (SD = 0.941). There was no statistically significant difference among the three trustworthy videos, χ^2 (2) = 0.500, p = 0.779. The set of the three selected untrustworthy videos includes two women and one men.

The three selected untrustworthy videos scored the values of M = 2.600 (SD = 0.986), M = 2,867 (SD = 1.060), M = 2.800 (SD = 1.014). There was no statistically significant difference among the three untrustworthy videos. We conducted a Friedman test, which reported χ^2 (2) = 1.027, p = 0.598. The three selected untrustworthy videos were men.

The neutral videos for the filler trials achieved the values of M = 4.400 (SD = 1.454), M = 3.867 (SD = 1.356), M = 4.400 (SD = 1.765), M = 4.267 (SD = 1.280), M = 4.267 (SD = 1.534), M = 3.933 (SD = 1.580), M = 4.533 (SD = 1.552). There was no statistically significant difference among the filler videos, χ^2 (6) = 5.014, p = 0.542. Of the remaining videos rated by the participants, none of them obtained a neutral value. As we needed 9 videos for the filler trials and we only had 7 videos with a neutral value, we choose two random videos to be used in the last two trials. As these videos were used at the end of the test to discard drops in cooperativeness, the average trust values obtained are irrelevant, since those trials do not influence the results of the previous trials. All the selected neutral videos for the filler trials were made by men.

There was a statistically significant difference among the trust ratings across the three categories (averaged for all videos in each category), χ^2 (2) = 26.533, p <.0001. A Wilcoxon Signed-Rank test indicated that the trust ratings of the untrustworthy videos were statistically significantly different than the trustworthy videos, z=-3.423, p <.001. There were also observed significant differences between the neutral and trustworthy videos, z=-3.125, p <.002, as well as the negative and neutral videos, z=-3.408, p <.001.

Dependent variables

The goal of our study is to understand the differential impact and correlation of the reputation and videos of the seller (independent variables) on the behavior of a person playing the role of buyer in a standard trust game. To understand this impact, we measured separately trust and purchase decisions (dependent variables) of the buyer regarding each seller:

- Purchase decisions: Buyer will decide whether to buy or not an item from the seller, by clicking the Buy/Not buy button respectively.
- Trust ratings: After the purchase decision the buyer will indicate how much they trusted the seller, trough a 7 point likert scale, ranging from 1 (high distrust) to 7 (high trust).

Participants

The main test was conducted by a set of 40 students (16 men, 24 Women) with an average age of 20.15 years with a standard deviation of 1.861. The participants described their online shopping experience in terms of purchases per year as: 0 - 15%, [1 - 3] - 45%, [4 - 6] - 15%, [7 - 9] - 20%, 10+ - 5%.

Procedures

The experiment took place at Instituto Superior Técnico. This was the same location of the pretests. We choose the same location to assure that the participants of both tests had similar profiles.

The participants were recruited personally, where they were invited to participate in an experiment. Each participant conducted the test individually. Each test had the duration of approximately 10 minutes. The participants played the standard trust game. The first step was to introduce the participants to the standard trust game, explaining the rules of the game and the payoff matrix. The application developed for the test contained a tutorial that described in detail each step of the standard trust game as well the expected actions of the users during the test. The participants were told in the beginning of the experiment that they could win up to 5 candies, depending on the performance.

The participants were told that they were going to assume the role of buyer, and that they were going to play against other 18 participants (sellers), whose actions in the game were previously collected. It was also explained that the sellers had the choice to record or not a profile video of themselves. These sellers in fact did not exist, the participants played the game against a simulation made by the computer.

The results of each transaction were not presented immediately to the participants (as there was no one playing against them). The participants were told that the money earned based on the sellers decisions would be added up and presented at the end of the experiment.

The participants were presented with all nine combinations of the payoff matrix (trustworthy video, untrustworthy video, missing video) * (positive reputation, negative reputation, missing reputation). The participants were able to see the reputation score and the profile video of each seller (in the cases that a seller had a profile video). The participants decided whether to buy or not from that particular seller, based on the information of that seller. After the purchase decision, the participants were also prompted for their trust rating regarding the seller on a 7-point-scale.

The sellers had a three star reputation (representing moderate distrust), a four start reputation (representing moderate trust) or missing reputation. The videos selected in the pretest were used as the profile videos of the sellers.

Additionally to the 9 trades from the matrix, we used other nine filler trades. The sellers of these trades had a reputation of one, two or five stars, in order avoid the repetition of the reputation scores of the real trades. The videos of the sellers were selected in the pretest, in which they were rated as neutral. Some of these filler trades were placed in the beginning of the experiment, in order to participants familiarize with the procedures. Some filler trades were also placed in the end of the game to discard drops in cooperativeness. The participants were presented to eighteen sellers, 9 from the payoff matrix and 9 filler trades.

4 RESULTS

In this section we present and discuss the results of the experiment that we conducted to help us understand the impacts of videos and reputation scores in online transactions.

Effects of reputation scores and seller videos on purchase decisions

The participants decided whether to buy or not an item from each seller of the 3*3 combination matrix. Those purchase decisions are presented in detail in this section.

Table 1 summarizes the effects of reputation scores and seller videos on purchase decisions. This table is presented as a line chart in figure 4.

Table 1: Number of purchases and expected frequencies (in parentheses).

Purchases	Reputation (1st factor)			Total
	None	Negative	Positive	
Video (2nd factor)				
None	2 (7.34)	10 (11.32)	23 (16.35)	35
Negative	4 (6.50)	9 (10.02)	18 (14.48)	31
Positive	29 (21.17)	35 (32.66)	37 (47.17)	101
Total	35	54	78	167

Effects of reputation scores on purchase decisions. A Friedman test was applied to the marginal distributions of purchases in order to understand the influence of reputation scores. The test revealed a statistically significant effect found for reputation, χ^2 (2) = 29.485, p <.0001.

Positive reputation contributed towards more purchases than missing and negative reputation. Sellers with positive reputation led to 78 purchases in 120 possible (65%). A Wilcoxon Signed-Rank test indicated that the purchases of positive reputation were statistically significantly different than negative reputation(z=-3.408, p <.001) and missing reputation (z=-4.466, p <.0001).

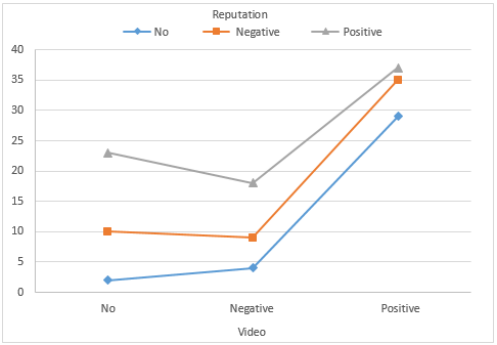

Figure 4: Effects of reputation and videos on purchase decisions (0-40)

There was also a significant difference between negative and missing reputation. A Wilcoxon Signed-Rank test indicated that the purchases of negative reputation were statistically significantly different than missing reputation(z=-2.842, p <.004). The absence of reputation led to significantly less purchases than negative reputation. This reveals that the participants had more difficulties trusting in a seller that has no transactions record. Sellers with negative reputation led to 54 purchases (45%), as sellers with no reputation led to 35 purchases (29.167%).

Effects of videos on purchase decisions. A Friedman test was applied to the marginal distributions of purchases in order to understand the influence of videos. The test revealed a statistically significant effect found for videos, χ^2 (2) = 54.250, p <.0001.

Trustworthy videos contributed towards more purchases than missing and untrustworthy videos, regardless the type of reputation of the seller. A Wilcoxon Signed-Rank test indicated that the purchases of trustworthy videos were statistically significantly different than untrustworthy (z=-5.097, p <.0001) and missing videos (z=-5.277, p <.0001). Sellers with trustworthy videos led to 101 purchases in 120 possible (84.167%). The number of purchases were even greater than the number of purchases of positive reputation. Trustworthy videos led to more purchases than positive reputation. A Wilcoxon Signed-Rank test revealed that the purchases of trustworthy videos was statistically significantly different than positive reputation (z=-3.147, p <.002).

There was not a significant difference between untrustworthy and missing videos. A Wilcoxon Signed-Rank test indicated that the purchases of untrustworthy videos were not statistically significantly different than missing videos(z=-0.645, p <.519). This reveals that exposing through video in online transactions does not have many potential to sellers if the video is considered untrustworthy. Sellers with untrustworthy videos led to 31 purchases (25.833%), as sellers

with no video led to 35 purchases (29.167%). Untrustworthy videos even led to less purchases than negative reputation.

It is noteworthy the increase of purchases in the cases where the seller had trustworthy videos comparing to the cases where the seller had untrustworthy or missing videos.

*Effects of videos * reputations combinations on purchase decisions.* Cochran's Q test determined that there was a statistically significant difference in the purchase decisions for each treatment condition, χ^2 (8, N = 40) = 144.231, p <.0001, indicating that the treatment condition influenced the purchase decisions of the participants.

As expected, the combination where the seller had positive reputation and trustworthy videos were the one that achieved more purchases, leading to 37 purchases in 40 possible (92.5%).

The three combinations where the seller had a trustworthy video were the combinations that obtained more purchases - trustworthy video with positive reputation (37 purchases - 92.5%), negative reputation (35 purchases - 87.5%) and missing reputation (29 purchases - 72.5%). The combination with trustworthy video that obtained less purchases, trustworthy video and missing reputation, still managed to obtained more purchases than any other combination that did not have trustworthy videos, including positive reputation with missing video (23 purchases - 57.5%) and untrustworthy video (18 purchases - 45%). This means that sellers that had trustworthy videos obtained higher purchase rates than sellers that did not had a trustworthy video even if they had a better reputation score.

Comparing the two extreme conditions, completely negative information, negative reputation and untrustworthy video, resulted in more purchases (9 purchases - 22.5%) than completely missing information, missing reputation and video (2 purchases - 5%).

Missing reputation led to the worse two purchase rates, when the seller did not have a video (2 purchases - 5%) and when the video was untrustworthy (4 purchases - 10%).

The combination where the seller had negative reputation and missing video led to 10 purchases (25%), similarly to the case where the seller had untrustworthy video and negative reputation (9 purchases - 22.5%).

When the seller has missing reputation, using a trustworthy video results in a substantial increase in the number of purchases, obtaining even more purchases than a seller that already has a positive reputation record but does not use video. This reveals that a seller that has no transactions records by using trustworthy videos can reach a status similar or even superior than sellers that already has transactions record.

Effects of reputation scores and seller videos on trust ratings

After participants decided whether to buy or not an item from each seller of the 3*3 combination matrix, they were asked to rated how much they trusted the seller in a 7 point likert scale, ranging from 1 (high distrust) to 7 (high trust). Those trust ratings are presented in detail in this section.

Table 2 summarizes the effects of reputation scores and seller videos on trust ratings. This table is presented as a line chart in figure 5.

Table 2: Mean trust ratings and standard deviations (in parentheses).

Trust	Reputation (1st factor)			Total
	None	Negative	Positive	
Video (2nd factor)				
None	1.50 (1.06)	2.63 (1.17)	3.53 (1.45)	2.55 (1.48)
Negative	2.45 (1.11)	3.10 (1.03)	3.80 (1.29)	3.12 (1.27)
Positive	4.20 (1.40)	4.73 (1.01)	5.40 (0.90)	4.77 (1.22)
Total	2.72 (1.64)	3.48 (1.40)	4.24 (1.48)	

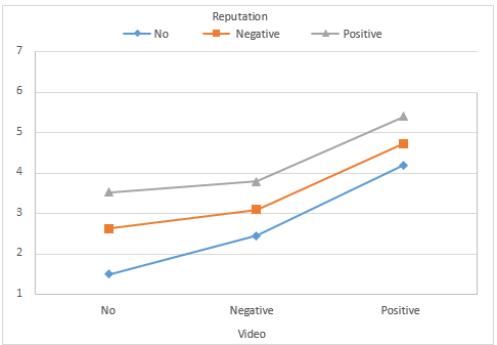

Figure 5: Effects of reputation and videos on trust ratings (1-7)

Effects of reputation scores on trust ratings. A two way (factorial) ANOVA with repeated measures was applied to analyze the effects of profile videos and reputation scores on trust ratings. There was a statistically significant main effect found for reputation, $F(2,78) = 47.453$, p <.0001, partial η^2 = 0.549.

Post hoc tests using the Bonferroni correction revealed a statistically significant difference between the three levels of reputation (positive, negative and missing) on trust ratings. The results of the test are presented in table 3.

Positive reputation had a greater positive contribution towards buyers' trust than missing and negative reputation.

Table 3: Bonferroni post hoc pairwise comparison test for trust ratings across the levels of the reputation scores factor

(I) Reputation	(J) Reputation	Mean Difference (I - J)	Sig.
Positive	Negative	0.758	<0.001
	No	1.525	<0.001
Negative	Positive	-0.758	<0.001
	No	0.767	<0.001
No	Positive	-1.525	<0.001
	Negative	-0.767	<0.001

Sellers with positive reputation averaged a trust rating of 4.24 (SD = 1.48).

There was also significant difference between negative and missing reputation. The absence of reputation led to significantly lower trust ratings than negative reputation, corroborating that the participants had more difficulties trusting in a seller that has no transactions record. Sellers with negative reputation averaged a trust rating of 3.48 (SD = 1.40), as sellers with no reputation averaged a trust rating of 2.72 (SD = 1.64).

Effects of videos on trust ratings. A two way (factorial) ANOVA with repeated measures was applied to analyze the effects of profile videos and reputation scores on trust ratings. There was a statistically significant main effect found for videos, $F(2,78) = 86.893$, $p < .0001$, partial $\eta^2 = 0.690$.

Post hoc tests using the Bonferroni correction revealed a statistically significant difference between the three levels of video (trustworthy, untrustworthy and missing) on trust ratings. The results of the test are presented in table 4.

Table 4: Bonferroni post hoc pairwise comparison test for trust ratings across the levels of the video factor

(I) Video	(J) Video	Mean Difference (I - J)	Sig.
Positive	Negative	1.658	<0.001
	No	2.225	<0.001
Negative	Positive	-1.658	<0.001
	No	0.567	0.006
No	Positive	-2.225	<0.001
	Negative	-0.567	0.006

Trustworthy videos had a greater positive contribution towards buyers' trust than missing and untrustworthy videos, regardless the type of reputation of the seller. Sellers with trustworthy videos averaged a trust rating of 4.77 (SD = 1.22).

There was a significant difference between untrustworthy and missing videos on trust ratings, although this was not reflected on purchase rates. Untrustworthy videos had a greater positive contribution towards buyers' trust than untrustworthy videos. Sellers with untrustworthy videos averaged a trust rating of 3.12 (SD = 1.27), as sellers with missing video averaged a trust rating of 2.55 (SD = 1.48).

*Effects of videos * reputations combinations on trust ratings.* As expected, the combination where the seller had positive reputation and trustworthy videos were the one that had a greater positive contribution towards buyers' trust, averaging 5.4 (SD = 0.9).

The three combinations where the seller had a trustworthy video were the combinations that had the greatest mean trust ratings - trustworthy video with positive reputation (5.4, SD = 0.9), negative reputation (4.73, SD = 1.01) and missing reputation (4.2, SD = 1.4). All the combinations with a trustworthy video managed to obtained greatest mean trust ratings than any other combination that did not have trustworthy videos, including positive reputation with missing video (3.53, SD = 1.45) and untrustworthy video (3.8, SD = 1.29). This means that trustworthy videos had a greater positive contribution towards buyers' than untrustworthy and missing videos even if the sellers had a better reputation score.

Comparing the two extreme conditions, completely negative information, negative reputation and untrustworthy video, resulted in a greatest mean trust rating (3.1, SD = 1.03) than completely missing information, missing reputation and video (1.5, SD = 1.06).

Missing reputation led to the worse two trust ratings, when the seller did not have a video (1.5, SD = 1.06) and when the video was untrustworthy (2.45, SD = 1.11).

When the seller has missing reputation, using a trustworthy video results in a substantial increase in the trust ratings, obtaining even higher trust ratings than a seller that already has a positive reputation record but does not use video.

Photo vs Video

Bente et al.[2] conducted a study where they intended to understand the effects of photos and reputations scores of a seller, when these two trust building mechanisms co-occur in an online transaction (described in detail in section 2). We proposed to extend this study, by using a richer media source, using a profile video of the seller instead of a profile photo. In this section we compare and discuss the results that we have obtained with the results of Bente et al.[2] experiment.

In figure 6 it is presented a line chart comparing the purchase decisions of the two experiments. The values of the graph are presented on percentages since there was a different number of participants (36 on Bente et al.[2] experiment, 40 on our experiment). In figure 7 it is presented a line chart comparing the mean trust ratings of the two experiments.

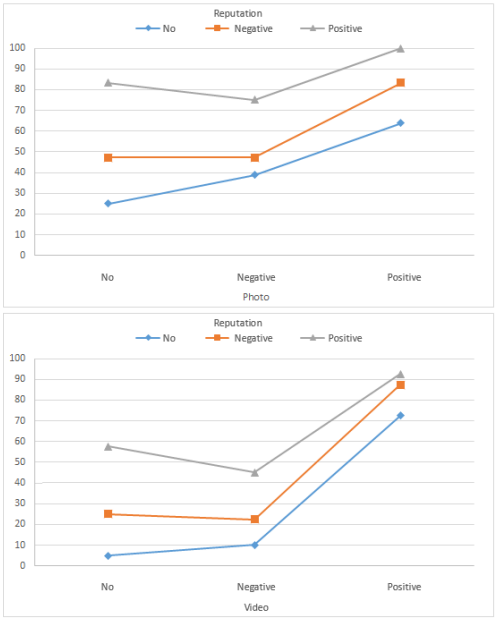

Figure 6: Comparison of the effects of reputation and photo(top) / video(bottom) on purchase decisions (0-100%)

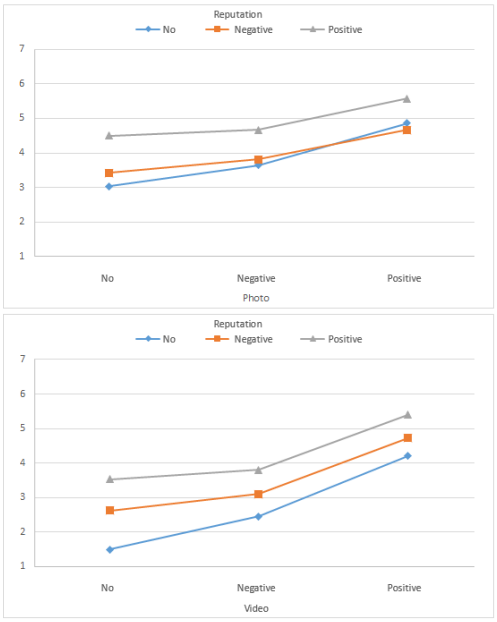

Figure 7: Comparison of the effects of reputation and photo(top) / video(bottom) on trust ratings (0-7)

In both experiments it is possible to identify some similarities in the results. In both cases positive reputation of the seller significantly influenced the purchase decisions as well as the trust ratings compared to negative or missing reputation.

Missing reputation contributed to lower purchase rates than negative reputation in both experiments. This difference in purchases was reflected in our trust ratings, where there was a significant difference between missing and negative reputation, having missing reputation lower mean trust ratings than negative reputation. In Bente et al.[2] experiment this difference on trust ratings was not significant.

Trustworthy videos/photos also contributed to higher purchase rates and trust ratings than missing and untrustworthy videos/photos. However the increase registered when there was trustworthy videos in relation to the other video conditions was significantly higher than the increase of the using trustworthy photos in relation to the other photo conditions. The use of trustworthy videos had a greater impact than the use of positive photos.

The sellers that had missing and untrustworthy videos/photos obtained similar purchase rates on both experiments. However, in our experiment there was a significant difference on trust ratings between missing and untrustworthy videos. Untrustworthy video had a higher trust ratings than missing videos. In Bente et al.[2] experiment this difference was not significant.

Untrustworthy videos obtained significant lower trust ratings and purchase rates than negative photos. This means that the use of untrustworthy video generated more reasons not to trust in the seller than the use of negative photos, sustained by the fact that videos are a richer media source.

5 CONCLUSION

In many situations it is hard to build trust among users in an online environment due to all the risks associated with these environments. In websites that involve transactions between the users, it is important to build trust among the parties involved in the transaction.

We investigated the influence of seller videos and reputations scores on trust building in online transactions. We used a standard trust game with three reputation conditions (positive, negative and no seller reputation) and three seller videos conditions (trustworthy, untrustworthy, no seller video) to measure the impact of seller videos and reputations scores in promoting trust among the users.

Positive reputation contributed towards buyers' trust and higher purchase ratings when comparing to missing and negative reputation.

Missing reputation led to significantly lower trust ratings and purchase rates than negative reputation, revealing that the participants had more difficulties trusting in a seller that has no transactions record. However, having a positive video can ameliorate this effect.

Sellers that had trustworthy videos obtained higher trust ratings and purchase rates than sellers that had negative or missing videos, even if they had a better reputation score.

There was a significant increase of trust ratings and purchase decisions when the seller had trustworthy videos, revealing the potential that exposing through a video has in online transactions. Trustworthy videos led to more purchases and higher trust ratings than positive reputation, revealing that emotional trust plays a bigger role than cognitive trust when performing online transactions. The use of trustworthy videos had greater impact than the use of trustworthy photos.

Untrustworthy videos have not contributed to higher purchases rates than missing videos, despite having led to higher trust ratings. This reveals that an untrustworthy video has the ability to reduce the anonymity and build basis of trust comparing with the cases where there is an absence of video, although this was not immediately reflected in purchase rates.

When the seller had missing reputation, using a trustworthy video resulted in higher purchase rates and trust ratings than a seller that already had a positive reputation record but does not used video. This reveals that a seller that has no transactions records by using trustworthy videos can reach a status similar or even superior than sellers that already has transactions record.

6 FUTURE WORK

As future work we propose the extension of the current study in order to understand more clearly the impacts of videos in online transactions. In our experiment we used a simplistic website where sellers appear consecutively, and the participants decided whether or not to buy an abstract item from that seller, based on the reputation and profile video. The experiment could be extended by conducting it in a less abstract scenario. The scenario could be a realistic web store, where users can buy real items. It would also be interesting to see the results in a scenario that was not a one-time experience. For example, in our scenario sellers that had untrustworthy videos obtained significantly lower purchase rates and trust ratings that sellers that used trustworthy videos. In a scenario where participants could operate transactions over several weeks or months, it could be interesting to find out if the sellers that used untrustworthy or missing videos were progressively excluded from the website in favor of sellers that used trustworthy videos. It was also interesting to verify if sellers that use negative videos would overcome sellers that do not use videos. In our experience they obtained similar purchase decisions, but sellers with untrustworthy videos obtained higher trust ratings. It is possible that this trust transmitted by the untrustworthy videos to be favored by a long term experience.

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