In Thy Recommendation We Trust: The Role of Message Framing and Consumption Motivation in Building Consumers' Trust in the Recommender System Output

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Recommender systems are becoming increasingly important for supporting consumer decision making. In this study, we aim to explore the impact of message framing and the motivation driving the (future) consumption of the product/service the recommendation is sought for on trust in the recommender system's output. To test our hypotheses, we designed a 2 (Message framing: Authority vs. social-proof) x 2 (Consumption motivation: Utilitarian vs. hedonic) between-subjects experiment. The results show a main effect of consumption motivation on trust in the recommender system output. No statistical support was found for either the main effect of message framing or the interaction effect of message framing and consumption motivation on trust in the recommender system output.

Keywords: *recommender systems, message framing, consumption motivation*

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1. Introduction

While making purchasing decisions, consumers are often faced with either lack of information or information overload. To overcome this, consumers may seek recommendations from family members, friends, acquaintances, experts, or professionals. With the increasing reliance on smart devices and the rise of AI-powered technologies, another tool consumers have come to rely upon is recommender systems. Isinkaye, Folajimi, and Ojokoh (2015) define recommender systems as systems that provide suggestions to consumers by filtering vital information fragments out of a large amount of data based on consumer's preferences, interests, and previous behaviors. Such systems are used in a variety of (digital) consumer decision-making contexts (Ricci, Rokach, and Shapira 2022).

The effectiveness of a recommender system can be evaluated in various ways. Developers are interested in whether their system is working efficiently and providing the requested output, or whether it is in need of improvements (RSM Discovery 2020). In research, effectiveness of recommender systems is most commonly measured through accuracy and coverage (Isinkaye, Folajimi, and Ojokoh 2015). Regardless of how (in)accurate the recommendation outputs are, however, a recommender system will not be of much use if consumers do not trust its outputs (Montaner, López, and de la Rosa 2002). In this study, we examine the impact of message framing and consumption motivation on trust in the recommender system output. Also, we explore the potential moderating role of consumption motivation in the effect of message framing on trust in the recommender system output.

Past studies have suggested that message-centric factors, such as framing of the message, influence trust. Mehrotra, Jonker, and Tielman (2021) posit that consumer trust can be triggered by the social-proof heuristic, while the authority heuristic taps into the expertise dimension of trust. However, scientific research exploring the potential influence of different types of framing on trust in a recommender system's output is lacking. Consumers' purchase decisions are also affected by their motivation for consuming the products/services in question (Bušljeta Banks and De Pelsmacker 2014; Sharifi Fard, Alkelani, and Tamam 2019; Lu, Liu, and Fang 2016). Such consumption motivation might have a similar effect on trust toward the recommender system output. While some researchers have examined the effects of consumption motivation on the intention to use recommender systems (e.g., Y.-Y. Wang et al. 2015), research on the topic remains scarce. Therefore, this study examines recommender system output framing as a potential driver of consumers' trust in the system's output, as well

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as how the users' motivation driving the consumption of the product/service being recommended might influence the effect of output framing on trust.

2. Theoretical Framework

Jøsang and Presti (2004, 135) define trust as "the extent to which one party is willing to depend on somebody or something, in a given situation with a feeling of relative security, even though negative consequences are possible". Notably, in the digital era, trust takes place during the process of both human-to-human interaction and human-computer interaction (Cramer et al. 2008). Thus, in this study, we conceptualize trust as the consumer's willingness to believe the information provided by a system or to utilize a system's capabilities. As a latent construct, trust encompasses several dimensions, of which ability/competence, benevolence, and integrity are the most crucial (Mayer, Davis, and Schoorman 1995; Panniello, Gorgoglione, and Tuzhilin 2016) in the context of this study. In terms of recommender systems, ability refers to whether the recommendations are in line with the consumer's needs, benevolence refers to the consumer's perceptions of the recommender system acting in their best interest, and integrity refers to a recommender system's ability to follow commitments and credibility (Panniello, Gorgoglione, and Tuzhilin 2016).

Framing is used to increase the saliences of certain attributes of 'a perceived reality' (Entman 1993). It can act as a trigger for different types of heuristics in processing of the recommender system's outputs (Juan-José Igartua and Cheng 2009; Sundar 2007). According to the heuristic-systematic model (HSM), consumers can make judgments based on mental shortcuts to heuristics stored in their memory (Chaiken and Ledgerwood 2012). Because humans prefer to minimize their (cognitive) effort, heuristics are commonly used in information processing procedures (Lim 2013). Two heuristics in particular are important in the context of this study: the authority heuristic and the social-proof heuristic.

The authority heuristic (Sundar 2007), relies on the use of statements given by experts in the topic of the message. The heuristic of social proof is the psychological tendency of liking what other people like (Sundar 2007). Both types of heuristics can positively influence credibility evaluations of an online source (Sundar 2007). Given that authorities and experts are generally perceived as more credible than the common consumers because their recommendations are derived from professional knowledge (Mackiewicz 2010; Dinulescu and Prybutok 2022), it can be assumed that consumer's trust toward the output of the system

would be higher when it is framed in such a way that it activates the authority heuristic than when the framing is based on social proof. Thus, we posit that:

H1: Consumers exposed to recommender system output framed to trigger the authority heuristic will show higher levels of trust toward the recommender system output than those exposed to output framed to trigger the social-proof heuristic.

Trust differs between different contexts and between different usage and consumption motivations. Consumers like accurate recommendations since they are relevant, and the accuracy of a recommender system can positively influence consumer's trust (Panniello, Gorgoglione, and Tuzhilin 2016). However, consumers are, for example, less likely to value accuracy of the recommendations while considering trust in the educational and entertaining contexts than in the e-commerce context, due to fewer risks of financial losses (Cramer et al. 2008). It can, thus, be expected that differences in consumer's motivations driving the consumption of the topic of the recommendation may result in different levels of trust.

Utilitarian and hedonic motivations are among the most often studied drivers of consumption in advertising and consumer behavior. Utilitarian motivation is considered 'instrumental, functional, and goal-oriented' (Hirschman and Holbrook 1982), while hedonic motivation focuses more on the fun, pleasure, and excitement derived from the consumption itself (Lu, Liu, and Fang 2016; Venkatesh, Thong, and Xu 2012). For example, when consumers are motivated to visit restaurants because they expect this experience to be pleasant and enjoyable (Stafford, Stafford, and Day 2002), these visits are primarily driven by hedonic motivations (Hirschman and Holbrook 1982; Y.-Y. Wang et al. 2015). In situations when consumers choose to eat at a restaurant for the sake of convenience, lower cost, or to meet specific dietary or health needs, these visits are mostly driven by utilitarian motivations.

Previous studies show that consumption motivation is an important antecedent of trust (e.g., Mayer, Davis, and Schoorman 1995; Panniello, Gorgoglione, and Tuzhilin 2016; W. Wang and Benbasat 2007). Moreover, quality of a hedonic product or service heavily relies on the individual's sensations derived from the consumption (Voss, Spangenberg, and Grohmann 2003). The criteria that determine the consumer's satisfaction with the consumption experience are dependent on personal tastes and experiences (Bušljeta Banks and De Pelsmacker 2014). As stated above, consumption driven by utilitarian motives, on the other hand, is pragmatic and practical in nature. The criteria to assess the satisfaction with a product or service consumed for utilitarian purposes are, thus, less individualized, enabling

easier objective assessment of product/service quality (Bušljeta Banks and De Pelsmacker 2014; Voss, Spangenberg, and Grohmann 2003). This, possibly, makes it easier for a consumer to trust the recommendation of others, including recommender systems. We, therefore, posit that:

H2: Consumers with a utilitarian consumption motivation will show higher levels of trust toward the recommender system output than those with a hedonic consumption motivation.

When driven by hedonic motivation, consumers care about the experience, enjoyment, entertainment, and their personal interests (Hirschman and Holbrook 1982). In such a context, they may prefer to rely on other people who have, for example, similar tastes and restaurant preferences rather than listening to food critics and nutritionists (Feick and Higie 1992). On the other hand, when their consumption is based on utilitarian motivation, consumers prefer recommendations from experts (Stafford, Stafford, and Day 2002; Y.-Y. Wang et al. 2015; Feick and Higie 1992). It can, thus, be expected that consumption motivation (hedonic vs. utilitarian) plays a moderating role on the relationship between the framing of recommendation outputs and the consumer's trust in the recommender system output.

H3: The effect of message framing on trust in the recommender system output is moderated by consumption motivation, such that (b) the effect of the authority frame is stronger for consumers with a utilitarian consumption motivation, and (b) the effect of the social-proof frame is stronger for consumers with a hedonic consumption motivation.

3. Method

To test the hypotheses, a 2 (Message framing: Authority vs. social-proof) x 2 (Consumption motivation: Utilitarian vs. hedonic) between-subjects experiment was designed. A total of 354 people participated in the study. Fifty-eight of them were labelled as speeders (for spending less than a minute reading the scenario and answering the trust measure) and were therefore omitted. The final sample consists of 296 participants (79.9% female; $M_{\text{age}} = 20.77$). Meta-analyses of research into trust in human-AI interactions have shown that human (such as the consumption motivation studied here) and environment (such as message framing) factors generally result in small to medium effect sizes. For example, Hancock et al. (2011) found, for experimental studies, a small integrated effect size for human factors (Cohen's $d = -0.02$) and a medium integrated effect size for environmental factors

(Cohen's $d = 0.47$). Taking this into account, we conducted an a priori power analysis (G*Power 3.1.9.7; Faul et al. 2007) to determine the sample size required to detect small-to-medium size effects ($\eta_p^2 = .04$; $\alpha = .05$) with 80% power. This calculation showed that we need a sample of at least 277 participants across four groups, which was achieved.

The stimuli for the study consisted out of two elements: (1) a scenario providing an explanation of the motivation driving the consumption of the service (restaurant) the recommendation from the system was sought for, and (2) a screenshot of the recommender system output, showing the opening line and three recommended restaurants. While the opening line of the output was manipulated between conditions to either trigger the authority or the social-proof heuristic, the rest of the output screenshot was kept constant. The recommender system had a conversational user interface like that of ChatGPT, because this is one of the most popular chatbots at the time of the study (Milmo 2023). A within-subjects pretest was conducted to test the stimulus materials ($N = 41$; $M_{\text{age}} = 30.61$, 65.9% female). Paired-samples t-tests showed that the utilitarian scenario ($M = 5.36$; $SD = 1.15$) was considered more utilitarian than the hedonic scenario ($M = 4.56$; $SD = 1.24$), $t(40) = 4.30$, $p < .001$, 95% CI [0.42, 1.18], Cohen's $d = 1.19$, and the hedonic scenario ($M = 5.58$; $SD = 1.14$) was perceived as being more hedonic than the utilitarian message ($M = 3.46$; $SD = 1.19$), $t(41) = 9.20$, $p < .001$, 95% CI [1.65, 2.58], Cohen's $d = 1.47$. Also, the social proof prompt ($M = 4.85$; $SD = 1.57$) was perceived to be more based on other users' choices (7) than the authority prompt ($M = 3.54$; $SD = 1.89$), $t(41) = 3.62$, $p < .001$, 95% CI [0.58, 2.05], Cohen's $d = 2.33$. In sum, the manipulations were successful. However, while the manipulation of the basis for the recommendation did result in significant differences between conditions, both means fell above the mid-point of the scale. Therefore, we adjusted the formatting of the text in the stimulus to emphasize the manipulation more clearly. These versions of the stimuli were then included into the main study.

At the start of the questionnaire, participants were asked for informed consent. Afterward, they were shown a definition of recommender systems and were asked to what extent they are familiar with recommender systems. Also, trust propensity was measured. Then, participants were randomly assigned to one of four conditions and exposed to a combination of a scenario and a screenshot of the recommender system output. Subsequently, trust in the recommender system output ($M = 4.42$, $SD = 0.92$, $EV = 4.32$, $R^2 = .54$, Cronbach's $\alpha = .87$) was measured using an eight-item 7-point Likert scale, adapted from

Cramer et al. (2008). For our manipulation checks, participants were asked to evaluate the scenario describing the motivation for the restaurant visit using an adapted version of the hedonic utility scale (HED/UT; Voss, Spangenberg, and Grohmann 2003), as well as with an item measuring whether the consumer perceived the recommender system output to be generated based on *opinions of experts* (1) or *other users' choices* (7). Finally, participants' age and gender identity were recorded, after which they were thanked for their participation.

4. Results

Two manipulation checks were performed, both indicating that manipulations were successful. The authority message ($M = 3.64$, $SD = 1.89$) perceived as more based on opinion of experts than those of other users when compared to the social proof message ($M = 2.67$, $SD = 1.43$, $p < .001$). Participants in the utilitarian consumption ($M = 5.35$, $SD = 0.96$) condition indicated the scenario to be more driven by utilitarian motives than those in the hedonic condition ($M = 4.79$, $SD = 1.22$, $p < .001$), and vice versa (hedonic condition: $M = 5.57$, $SD = 1.05$; utilitarian condition: $M = 4.53$, $SD = 1.29$, $p < .001$, Hedges $g = 0.87$).

To test our hypotheses, we ran a two-way ANOVA with message framing and consumption motivation as independent variables and trust in the recommender output as dependent variable. The model was non-significant, $F(3, 292) = 1.44$, $p = .163$. Planned contrasts showed no significant main effects on trust of message framing, $t(294) = -0.98$, $p = .329$, Hedges $g = -0.11$, but did show a significant main effect of consumption motivation, $t(294) = -2.05$, $p = .041$, Hedges $g = -0.24$. Specifically, when a recommendation is sought for a product/service for a utilitarian motivation, this leads to higher levels of trust in the recommender system's output ($M_{uti} = 4.52$, $SD = 0.95$) than for a consumption based on hedonic motivation ($M_{hed} = 4.31$, $SD = 0.87$). In addition, the results indicate a non-significant interaction effect. This means the data only supports H2, though not H1 and H3.

5. Discussion

This study explores the impact of message framing and consumption motivation on trust in the recommender system output. The results do not support any of the hypothesized effects of message framing. No statistical support was found for the main effect of message framing on trust in the recommender system's output, nor did we find support for the interaction effect of message framing and consumption motivation on trust in the recommender system output.

Thus, based on this study, we can conclude that message framing does not play a role in building trust in the recommender system output. Regardless of whether the output is framed as a recommendation based on the opinions of experts (i.e., authority) or of consumer's peers with similar tastes (i.e., social proof), the consumer will trust that output equally.

The study does, however, show that the motivation driving the (future) consumption of the product/service the recommendation is sought for impacts the level of trust the consumer puts in the output of the recommendation system, as predicted by H2. Namely, those consumers who engage with the recommender system seeking a recommendation for a product or service they intend to consume for practical, utilitarian purposes exhibit higher levels of trust in the system's output than those who seek a recommendation for a product or service they intend to consume for the hedonic pleasure of enjoying the experience. In other words, we put more trust in the recommender system's output when it provides recommendations for products or services that can be objectively assessed based on a relatively universal set of functional criteria than when the criteria for assessment of the quality of the product/service are person- and experience-specific.

The main limitation of this study is the fact that it was based on a scenario design, i.e., on "a sketch of use […] intended to vividly capture the essence of an interaction design" (Rosson and Carrol, John 2002, p. 161), instead of a more realistic actual interaction between the participant and the recommender system. While a scenario-based design enabled more control over the experiment across condition, thus ensuring internal validity of the study (Kim and Jang 2014), this comes at the expense of external validity (Bardsley 2005). The use of scenario-based designs has been found especially problematic for studying contexts involving potential monetary loss, as well as those focused more on emotions than cognition (Kim and Jang 2014). Future studies should, thus, be conducted to confirm the findings of the present study through a more realistic and immersive interaction design.

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