The Effect of Consumer-Activated Mind-Set and Product Involvement on the Compliance With Recommender System Advice

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Abstract
Whereas the research gauging the effectiveness of e-commerce recommender systems (RS) has depended on their design factors, recent work proposes a key role for consumer’s psychological factors. Involvement should reduce the compliance with RS advice because a consumer highly involved with the product perceives high choice risk and assigns low value to the advice. However, a consumer’s activated mind-set captured by implicit theory (fixed vs. growth mind-set) should also shape compliance. It is hypothesized that the two factors interact to jointly mitigate advice taking. Specifically, consumers whose fixed mind-set is primed comply with the RS advice less often when involvement is high. This and other anticipated effects (i.e., consumer’s importance of social approval, positive affect, and need for cognition) on advice compliance are tested in an experiment on 251 Canadian adults. In the experiment, compliance occurred when the participant follows the RS advice, and product involvement was initially measured. The results show that priming a fixed mind-set, which orients shoppers toward a performance goal, motivates them to comply with the RS advice when involvement is low. Priming a growth mind-set, which orients shoppers toward a learning goal, nullifies such effect. Positive affect and the importance of social approval had no significant impact on advice taking. Therefore, the effect of involvement on RS effectiveness is contingent on the shopper’s accessible mind-set.

Keywords
consumer lay theory, product involvement, recommendation agents, growth vs. fixed mind-set, electronic commerce

Recommender Systems Are Ubiquitous, But What About Their Effectiveness?

In retail and business settings, the role of recommendations is indisputable (Behera et al., 2019). The advent of e-tail facilitates people’s exposure to the recommendations provided by experts, other people, and recommender systems (RS). Whereas research has addressed the advice provided by a human agent, it is yet to fully address the one provided by RS (Srivastava et al., 2019). RS support rather than replace the decision-making process by providing a group of “best match” products that optimize a shopper’s utility function. People sacrifice choice accuracy in return for less effort, but inaccurate choices backfire. A shopper that made a poor choice would develop a negative attitude toward the retailer. Therefore, enormous is the potential of effective RS.

Recommendations are effective to the extent that people follow them. In numerous cases, shoppers do not follow the e-recommendations or intentionally contradict them, reducing their effectiveness. Researchers elucidate that shoppers develop psychological reactance toward the recommendation because they perceive it as a threat to their freedom of choice or question its legitimacy (Brehm, 1966). In addition, majority of research have focused on the role of design factors such as algorithm accuracy, transparency, and interactivity in driving RS effectiveness (He et al., 2016). Research has offered few explanations of effectiveness based on contextual and psychological factors (Ghazali et al., 2018; Srivastava et al., 2019). Several RS are forced offline notwithstanding their high cost and advanced methods. Kwon and Chung (2010) argued that a main reason for the failure of such RS as Personalogic.com is that their methods are built around product functionality and attributes. Recent work has

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further reported unexpected, negative consequences for providing electronic recommendations (Häubl et al., 2017; Lajos et al., 2012). These results delineate a gap in the literature. This research argues that such gap can be better addressed by showing the role of a consumer’s psychological factors.

The role of involvement in decision-making has rarely been investigated (Ghazali et al., 2018; Holmes et al., 2014). Product involvement—consumer’s ongoing concern for a product class—is positively linked to key responses such as perceived risk and the extensiveness of the decision-making process (Mittal & Lee, 1989; Richins & Bloch, 1986; Venkatraman, 1989). Ghazali et al. (2018) recently found a negative impact of psychological involvement on the compliance with RS advice. A negative impact on RS effectiveness is expected: the more the shoppers are involved with a product, the less they appreciate the RS advice, that is, the more often they contradict it. A second relevant factor is a consumer’s accessible mind-set. A consumer’s implicit theory (fixed vs. growth mind-set; Murphy & Dweck, 2016) governs a general belief in the malleability of personal traits (Song et al., 2019; Yorkston et al., 2010) and orients the consumer toward either a performance or a learning goal (Y. Y. Hong et al., 1997). The shopper’s accessible mind-set characterizes a decision style that alleviates RS effectiveness by shaping advice compliance. The literature further anticipates a role for a consumer’s importance of social approval and positive affect (mood) on choice.

It is argued that the interplay between two psychological factors (a consumer’s activated mind-set and product involvement) shapes RS effectiveness. Specifically, consumers whose fixed mind-set is primed should comply with the RS advice less often when involvement is high. The purpose of this research is to empirically test this hypothesis while investigating the role of positive affect, importance of social approval, and need for cognition on advice taking. The results help guide e-tailers in considering a consumer’s psychological factors, namely the accessible mind-set and product involvement, to enhance RS effectiveness. The following section will furnish the theoretical background, followed by the method which details the experiment and the results. The last section discusses the implications on RS theory and practice.

**Theoretical Background**

**Using Reactance Theory to Explain RS Effectiveness**

Freedom is a main human value. When freedom is restricted, people are motivated to restore it. The desire to restore threatened freedom is termed psychological reactance (Brehm, 1966). This theory, commonly used to study the effectiveness of e-recommendations (Fitzsimons & Lehmann, 2004; Hanus & Fox, 2017; Lee & Lee, 2009), stipulates that reactance is determined by a variety of factors including the intent to exercise freedom in the future, importance of freedom, and strength of the threat to freedom (Brehm, 1966). Significant effects of reactance were shown in various settings, including acting contrary to persuasion attempts and refusing to return an obligating favor (Brehm & Cole, 1966). Simply put, reactance necessitates a negative response to an action (Lu et al., 2017).

Researchers have used reactance theory to explain how people respond to recommendations as well as promotions. Reinders et al. (2008) showed the reactance impact on the forced use of self-service technology. Wendlandt and Schrader (2007) evaluated customers’ reactance to loyalty programs using face-to-face interviews and found that the importance of autonomous buying behavior heightens reactance. Lee and Lee (2009) indicated that the perception of a future threat to freedom negatively influences the intention to use the RS. Alternatively, Fitzsimons and Lehmann (2004) delineated that the reactance resulting from recommendations inconsistent with first impression leads a person to intentionally contradict them. Lee et al. (2010) suggested that self-concept clarity negatively impacts RS effectiveness. Youn and Kim (2019) found that consumers’ perceived autonomy decreases ad-intrusiveness, increasing reactance and ad avoidance on Facebook. Trait reactance (a personal tendency to strongly react to recommendations) helped explain the compliance with social influence (S. M. Hong et al., 1994); later work questioned the validity and impact of trait reactance (Silvia, 2006). Researchers have thus focused on situational reactance, that is, how strongly shoppers react to the RS because it restricts their choice freedoms.

**Using Consumer Psychological Factors to Explain RS Effectiveness**

The literature indicates that shoppers respond to RS according to their idiosyncratic involvement, proposing three factors as moderators to this salient effect: a shopper’s importance of social approval, affect (i.e., mood), and activated mind-set. The empirical study thus tests these three potential moderators. Compliance usually occurs when a shopper follows the RS advice. The focus here was to underscore the effect of a consumer’s psychological factors on RS effectiveness because the RS design factors, including the calculation method and accuracy, have received ample coverage (Li & Karahanna, 2015). Research has indeed shown the effects of RS personalization (Behera et al., 2019). Therefore, the RS accuracy (a dominant option is recommended or not) was controlled for rather than manipulated. While the interplay between involvement and accessible mind-set on RS effectiveness will be shown, ruling out the effects of other psychological factors (the importance of social approval and affect) will be performed as well.
Consumer Involvement

Involvement is a consumer’s ongoing concern for a product class that arises from an ongoing interest with the product class and its relationship with the consumer’s self-concept and values (Richins & Bloch, 1986). Product involvement, usually stable for a person and independent of a purchase situation, was viewed as the importance of a product category to a consumer (Harrigan et al., 2018; Higie & Feick, 1989; Mittal & Lee, 1989). Zaichkowsky (1990) indicates that a person’s values, life goals, and life themes determine product involvement. Involvement has several antecedents (Mittal & Lee, 1989), such as product sign-value (possession of product category has symbolic value), product hedonic-value (capacity of product category to provide pleasure), and utility (the perceived benefits derived from product use). Involvement thus varies across individuals. While situational involvement can be distinct from enduring involvement, research has shown significant correlation between the two (Dholakia, 2001). Product involvement relates to relevance (MacInnis & Jaworski, 1989), and its effects on people’s response (such as recall, attention, information search, brand commitment, satisfaction, and early product adoption) have been shown (Coulter et al., 2003). For instance, advertisement processing is affected by involvement (MacInnis & Park, 1991).

Involvement should mitigate how consumers respond to the RS advice. Bauer et al. (2006) showed that consumer decision-making style depends on product involvement. Consumers use their mobile devices more when deciding to purchase high involvement products (Holmes et al., 2014). A consumer highly involved with a product is more active in acquiring and processing its information and develops higher expectation (Krishnamurthy & Kumar, 2018). Involvement affects the propensity to seek pre-purchase information (Dholakia, 2001). A highly involved shopper profoundly processes product information and develops elaborate meanings (Celsi & Olson, 1988). Furthermore, highly involved shoppers consider product choice to be self-related (Mittal & Lee, 1989). Hence, they will more scrutinize the RS input and regard it as irrelevant. For product involvement is a long-term concern, it strongly predicts perceived risk, prompting consumers to attentively process product information (Venkatraman, 1989). Situational and motivational factors affect the lowly involved consumers but have trivial impact on the highly involved (Kim et al., 2016). Involvement with a product category such as mobile phones correlates positively with perceived risk and the extensiveness of the decision-making process (Mittal & Lee, 1989; Richins & Bloch, 1986). Therefore, advice influence is mitigated in high involvement situations:

**Hypothesis 1 (H1):** Compared with the highly involved consumers, consumers with low product involvement comply with the RS advice more often.

Consumer’s Accessible Mind-Set: Fixed Versus Growth

The theory in personality specifies that people differ in their view of the variability of traits. People with fixed mind-set (i.e., entity theorists) assume that people’s personal attributes such as ability and intelligence are fixed, whereas people with growth mind-set (i.e., incremental theorists) assume that attributes are malleable (Murphy & Dweck, 2016). Such views determine the approach with which a consumer responds to people and situations. Poon and Koehler (2006) showed that when explaining the life choices of a person, participants with fixed mind-set focus on the person’s traits and attributes, whereas those with growth mind-set focus on the person’s context and psychological processes. Beruchashvili et al. (2014) found that dieters with a fixed mind-set tend to avoid negative social evaluations, dieting effort, physical activities, and group meetings support; on the contrary, dieters with a growth mind-set engage more in activities that help modify lifestyle.

This concept—consumer activated mind-set—has been used to explain diverse phenomena in consumer research. Jain et al. (2009) found that consumers with growth (fixed) mind-set are influenced (not influenced) by whether an ad is framed with an approach versus avoidance form. Yorkston et al. (2010) showed that a consumer’s belief in brand extendibility is affected by the activated mind-set. J. K. Park and John (2010) found that consumers with fixed mind-set thought they looked better and more glamorous after using Victoria’s Secret bag; consumers likewise rated themselves as more intelligent and with better leadership skills after using an MIT pen. Alternatively, the beliefs and perceptions of consumers with growth mind-set were not affected by the type of bag/pen used. These authors designated that the accessible mind-set should be considered to ensure ad appeal. Mathur et al. (2012) showed that the activated mind-set shapes judgments of brand personality. Rai and Lin (2019) found that consumers with growth mentality embrace risky investments because they are prone to promotion and self-development, whereas consumers with fixed mentality embrace risk-averse investments because they are prevention-prone. Song et al. (2019) illustrated how having growth mind-set drives consumers to engage in a multitude of Instagram activities. A consumer’s mind-set can be activated or primed using a short ad (Yorkston et al., 2010) or movie excerpt (Jain et al., 2009). Furthermore, playing with a growth-mind-set robot leads children to develop a growth mind-set (H. W. Park et al., 2017). The same results were obtained by scholars when they measured versus primed a consumer mind-set (Yorkston et al., 2010).

Consumers holding a fixed mind-set should comply with the RS advice more often. For one, these shoppers are prone to using a decision heuristic because they focus more on the object than on context (Chiu et al., 1997). They focus on outcome (which product to choose according to the RS), while shoppers holding a growth mind-set focus on process (which product to choose according to all available information).
Bullard et al. (2019) showed that consumers with a growth (vs. fixed) mind-set use more an abstract level of information processing, and their cognitive flexibility is higher. Holding a growth mind-set drives a consumer toward a mastery-oriented response (Murphy & Dweck, 2016). Because a growth mind-set drives consumers to believe in environment malleability and be context-sensitive (Poon & Koehler, 2006), they consider more the other factors such as the options’ attributes thus are more prone to alter their evaluations. On the contrary, consumers with fixed mind-set are highly susceptible to movement from a reference point (Chiu et al., 1997), focus on validation through comparison (Y. Y. Hong et al., 1997), and thus are more prone to comply with the RS. For these consumers, the RS advice represents a primary cue (reference point) indispensable to conduct quality choices. Consumers with growth mind-set were not affected when using Victoria Secret bags or MIT pens, whereas those with fixed mind-set were (J. K. Park & John, 2010).

Therefore, the activated mind-set should mitigate the involvement effect. When involvement is high, a consumer attentively considers product information—becomes less affected by motivational factors and less prone to engage decision heuristics (Kim et al., 2016). Because involvement predicts choice risk, consumers expend elevated cognitive efforts in contexts of high involvement. A fixed mind-set orients people toward performance goals, whereas a growth mind-set orients them toward learning goals (Y. Y. Hong et al., 1997). Lowly involved consumers holding fixed mind-set will focus on performance (making a decision with less effort) and be susceptible to decision heuristic (readily comply with the RS advice). This effect, termed herein the heuristic-proneness effect, should be salient for lowly involved shoppers. People with fixed mind-set believe that a high effort implies low ability (Murphy & Dweck, 2016) and make more trait inferences and attributions (Gervey et al., 1999). Because trait inference relates to evaluative processing, a fixed mind-set orients lowly involved consumers to interact positively with the RS. Alternatively, highly involved consumers engage in an exhaustive decision-making process (Mittal & Lee, 1989). In situations entailing elaborate processing (high involvement), consumers locate additional information to validate the outcome. That is, high involvement contexts motivate shoppers with fixed mind-set to make choices in a manner comparable to shoppers with growth mind-set. Therefore,

Hypothesis 2 (H2): Compared with consumers with a growth mind-set, consumers whose fixed mind-set is primed comply with the RS advice less (more) often when involvement is high (low).

Underlying Mechanism: Level of Information Processing

Need exists to explore how consumer mind-set shapes choice under different levels of involvement: Does the activated mind-set drive RS advice taking by attenuating the salience of social norms, by cultivating positive affect, or by increasing the exhaustiveness of the decision-process? If activating a fixed (growth) mind-set orients consumers toward a performance (learning) goal, or leads them to embrace abstract thinking and cognitive flexibility, then the activation should attenuate the level of information processing. Need for cognition (an individual variable that reflects the extent to which a person is inclined toward effortful cognitive activities; Cacioppo et al., 1984) should thus be attenuated according to the activated mind-set and involvement. While need for cognition is a relatively stable individual factor, motivators can attenuate it (Wang et al., 2015). The interaction effect of mind-set and involvement on the need for cognition should be significant, which helps explain the effect in the second hypothesis:

Hypothesis 3 (H3): Need for cognition should decrease (increase) when a fixed mind-set is activated for consumers with low (high) involvement.

Method

To test the hypotheses, an experiment was conducted rather than a survey. Depending on survey methodology in RS, research is not recommended because this method suffers from the lack of a common system for comparison and depends highly on recall. Using a Web design service, we created a sequence of pages to run the experiment, which had two manipulated conditions (fixed vs. growth mind-set) and two measured conditions for involvement (high vs. low). The design was between-subjects, meaning that each participant had to conduct one choice based on the RS advice.

Product Category and Information

The mobile phone was chosen as product category because (a) it is not a simple product and thus consumers would be attentive during choice; (b) it has multiple and widely known attributes, making the use of RS meaningful; (c) it is a product that people shop for online; and (d) it is a search product where the attributes can be reliably communicated on the Web. Realistic alternatives were chosen. The two alternatives (Samsung and LG) were manufactured by firms originating from same country to control for country-of-origin effects. Their prices were equated ($0 with a 2-year agreement and $150 with no agreement) to reduce the possibility of participants making a decision based solely on price and encourage them to consider the RS advice. The firm providing the communication service was concealed to reduce the effects of firm’s past experience and reputation.

Participants

Contacted by email, the participants were selected from a consumer panel of a major market research company in Canada named Leger. The panel consisted of about 170,000...
members. French Canadians inhabiting the province of Quebec and belonging to the panel constituted the sample frame; the invitation email was sent to randomly selected members from this frame. Initially, 298 responses were received (the response rate was 19%). A total of 47 responses were dropped because of incompleteness. Hence, 251 responses were retained. The sample did not show any important bias toward a specific demographic group (Table 1).

Table 1. Demographic Distribution of Sample (N = 251).

| Gender      | Percentage of Total | Age          | Percentage of Total |
|-------------|---------------------|--------------|---------------------|
| Female      | 57.0                | <30          | 22.4                |
| Male        | 43.0                | 30–45        | 29.2                |
|             |                     | 46–55        | 22.4                |
| Income (thousands of Canadian $) |           |              |                     |
| <25         | 22.1                | >65          | 11.2                |
| 25–49       | 50.6                | Education   |                     |
| 50–74       | 15.7                | High school or less | 29.8 |
| 75–99       | 6.4                 | Some university education | 36.8 |
| >99         | 5.1                 | University degree or higher | 33.5 |

Scenario and Measures

The measures in the questionnaire were same or adapted from prior work. Unless otherwise stated, a 5-point Likert-type scale (strongly disagree–strongly agree) was used, Cronbach’s alpha reflected internal consistency, and the p of chi-square tests was one-sided. Upon agreeing to participate by clicking on a link in the invitation message, the participant was asked: “Imagine that you are in a real situation shopping online for a mobile phone. Imagine that you have identified two good mobile phone offers from a well-known communication service provider. Now you want to choose one of these mobile phones.” The subsequent two pages were designed to seek personal information, which would encourage the participant to believe that the RS recognizes his or her preferences and lifestyle information. Specifically, these two pages measured the mobile phone use pattern (I make lots of phone calls, I send lots of text-messages, using a 3-point Likert-type), travel frequency (“I travel a lot” using a 3-point Likert-type), hand-use orientation (left- or right-handed), gender, and age. Product involvement measurement was included here (three items adapted from Mittal & Lee, 1989; In general, I have a particular interest in mobile phones, mobile phones are very important to me, mobile phones mean a lot to me, α = .92). On average, participants reported a product involvement of 2.64 out of 5 (SD = 1.16). A median split was performed to create two groups (high vs. low involvement).

The purpose of the third page was to activate or prime a specific mind-set using the method employed in Chiu et al. (1997). This priming technique, widely used by scholars (Yorkston et al., 2010), usually requires participants to read a paragraph after informing them that they would be tested on comprehension. To encourage attentive reading and reduce a successful purpose-guessing, the participant was presented with an item below the paragraph: “I think this piece of news should appear in newspaper: Agree-Somewhat Agree-Disagree.”

For the fixed mind-set activation, the text read as follows:

In his talk at the American Psychological Association’s annual convention held at Washington D.C. in August, Dr. George Medin argued that “in most of us, by the age of ten, our character has set like plaster and will never soften again.” He reported numerous large longitudinal studies, which show that people “age and develop, but they do so on the foundation of enduring dispositions.” He also reported research findings showing that people’s personality characteristics are fixed and cannot be changed.

For the growth mind-set activation, the text read as follows:

In his talk at the American Psychological Association’s annual convention held at Washington D.C. in August, Dr. George Medin argued that ‘no one’s character is hard like a rock that cannot be changed. Only for some, greater effort and determination are needed to effect changes.’ He reported numerous large longitudinal studies, which show that people can mature and can change their character. He also reported research findings showing that people’s personality characteristics can be changed even in their late sixties.

Next, a page with a progress bar appeared stating that “The recommendation agent is analyzing your responses in order to suggest the mobile phone that best corresponds to your profile.” When the progress bar reached 100%, the choice page appeared with the two options and information. On the top of that page, the participant was informed “Now, you want to choose one of the following two mobile phones.” The options were selected as competitive alternatives (Simonson, 1989). The RS recommended the same option (Samsung) to all participants to control for the effects from brand preference and first-impression choice (Fitzsimons and Lehmann, 2004), akin to prior work (Lee et al., 2010). The following text appeared below that option: “Based on the information you provided, the intelligent recommendation agent recommends that you choose the Samsung mobile phone.” More participants chose the recommended product (59.4% chose Samsung vs. 40.6% chose LG; Table 2).

After choice making, the participant completed the questionnaire (involvement was measured at the beginning and before choice as discussed). The importance of social approval was measured using five items from Fisher (1993) (It’s very important to me that others approve of: the kind of clothes I wear, where I spend my holidays, the kind of car I drive, etc.; α = .87, M = 1.92, SD = 0.90). A following page
contained the need for cognition scale (eight items from Cacioppo et al., 1984, for example, I prefer complex to simple problems, I like to have the responsibility of handling a situation that requires a lot of thinking, α = .77, M = 2.9, SD = 0.70). Four of the eight items were reversed and included in the last page along with the demographic items, to reduce common method bias. Other steps were applied to alleviate sources of common method bias ex-ante (Podsakoff et al., 2003): a temporal separation between the measures of the predictor and criterion variables was applied when possible, respondent anonymity was clearly communicated at the beginning of study, an observed measure was used for the important criterion variable (compliance with RS advice) rather than a perceptual measure, different response formats were used (e.g., bipolar and Likert-type, 3- and 5-point), ambiguity was reduced by using validated scales and concise terms, and bipolar numerical scale values were replaced with verbal labels (Not at all–Extremely). Positive affect was measured using five items from the Positive and Negative Affect Schedule (PANAS) scale (At this time I feel: active, alert, attentive, inspired, interested; 5-point bipolar items, α = .83, M = 3.41, SD = 0.80) of Watson et al. (1988). The questionnaire, translated by two professionals into French, was pretested.

Results

Testing H1

H1 predicts that shoppers with high (vs. low) product involvement comply with the RS advice less often. Frequency analysis shows that participants with high involvement chose the recommended option less ($\chi^2 = 8.82, p = .002$, Table 2). As reported in Table 2, no other factors (i.e., the importance of social approval, positive affect, need for cognition) had a significant effect on RS effectiveness; for example, participants who assigned high versus low importance to social approval did not differ in their compliance with RS advice. These results lend support to H1. Highly (vs. lowly) involved shopper profoundly processes product information, develops elaborate product meanings, and considers choice to be self-related (Celsi & Olson, 1988; Mittal & Lee, 1989). Hence, they tend to scrutinize the RS input more and regard it as irrelevant.

Testing H2

Compared with those with a growth mind-set, shoppers with a fixed mind-set are expected to comply with the RS advice more often when their product involvement is low versus high (H2). Frequency analysis for participants whose fixed mind-set was activated showed that, when involvement was low (vs. high), RS advice was followed more frequently ($\chi^2 = 11.91, p = .001$; Table 3). Participants whose growth mind-set was activated did not adhere to this effect ($p = .240$ NS). These results lend support to H2. Because involvement predicts choice risk, consumers with fixed mind-set expend elevated cognitive efforts in contexts of high involvement, thus comply less with the RS advice.

Additional analysis showed that the importance of social approval and positive-affect did not moderate the impact of involvement. That is, (a) choice frequency for participants with high versus low importance of social approval according to product involvement, and (b) choice frequency for participants in high versus low positive-affect state according to product involvement, showed insignificant differences (all $p > .25$). H1 and H2 received further support using logistic regression (with RS compliance as the binary dependent variable). In the logistical model, involvement was as significant factor ($\beta = -2.12, p = .001$) as well as its interaction with the accessible self ($\beta = 0.864, p = .022$).

Testing H3

Using analysis of variance (ANOVA) with accessible mind-set (growth vs. fixed mind-set), involvement (two categories by mean-split), and their interaction as predictors of the need for cognition showed marginal support for H3 (Figure 1). While the main effects were insignificant, the interaction effect approached significance ($F = 3.64, p = .057$) with means of need for cognition in the predicted direction. This result lends marginal support to H3.

Table 2. Choice Frequency and Chi-Square Tests.

| Factor (chi-square, sig.) | Level of Factor | Samsung | LG | Total |
|---------------------------|----------------|---------|----|-------|
| Product involvement       | Low involvement| 94 (67.6) | 45 (32.4) | 139 |
| (χ² = 8.82, p = .002)     | High involvement| 55 (49.1) | 57 (50.9) | 112 |
| Importance of social approval | Low importance | 73 (59.8) | 49 (40.2) | 122 |
| (χ² = 0.022, p = .492)    | High importance | 76 (58.9) | 53 (41.1) | 129 |
| Positive affect           | Low            | 62 (60.2) | 41 (39.8) | 103 |
| (χ² = 0.050, p = .463)    | High           | 65 (57.0) | 49 (43.0) | 114 |
| Need for cognition        | Low            | 84 (61.3) | 53 (38.7) | 137 |
| (χ² = 0.476, p = .287)    |                |          |    |       |
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Discussion

This research aimed to underline the role of two psychological factors, a consumer’s activated mind-set and product involvement, in determining RS effectiveness. It also aimed to investigate the role of relevant factors such as positive affect, importance of social approval, and need for cognition. The findings underscore the role of a consumer’s psychological factors in shaping advice influence: The interplay between a consumer activated mind-set and involvement in shaping the compliance with RS advice is supported. While the negative impact of involvement on RS effectiveness supports the recent finding of Ghazali et al. (2018), our results contribute by delineating that this impact is contingent on a consumer’s decision style, that is, activated mind-set. In general, the hypotheses received support, expounding the notion initially advanced by Y. Y. Hong et al. (1997) that holding a fixed mind-set orients people toward a performance goal. Focusing on performance motivates consumers to use decision heuristics (i.e., pay attention and comply with the RS advice) when involvement is low, a phenomenon termed the heuristic-proneness effect. Remarkably, the effect of involvement fades when a growth mind-set is activated. The results indicate that RS can be more effective for shoppers with a fixed mind-set.

Table 3. Choice Frequency and Chi-Square Tests According to Involvement and Mind-Set.

| Experimental condition (chi-square, sig.) | Samsung | LG | Total |
|------------------------------------------|---------|----|-------|
| Fixed mind-set                           |         |    |       |
| Low involvement                          | 51 (77.3) | 15 (22.7) | 66 |
| High involvement                         | 28 (47.5) | 31 (52.5) | 59 |
| Growth mind-set                          | 43 (58.9) | 30 (41.0) | 73 |
| Low involvement                          | 27 (50.9) | 26 (49.1) | 53 |
| High involvement                         |         |    |       |

Figure 1. Interaction effect for mind-set and involvement on need for cognition.

Implications for Theory

The majority of research aiming to fathom the effectiveness of e-commerce RS was based on design factors. Only recently research has started investigating alternative models. This article extends the model proposed by Ghazali et al. (2018) building on theory in personality. Specifically, the framework is based on an interplay between a consumer’s involvement and activated mind-set in shaping advice taking. It contributes by establishing a link between a consumer’s mind-set and the predisposition to respond favorably to the RS. In general, shoppers with high (vs. low) product involvement exhibit less predisposition to respond favorably to RS advice. This happens because highly involved consumers perceive high risk during choice, use decision heuristics less often, and their decision-making process is more exhaustive. Nonetheless, a consumer’s activated mind-set delineates a boundary condition, ostensibly by altering the level of information elaboration (need for cognition). Therefore, Y. Y. Hong et al.’s (1997) prediction—holding a fixed mind-set drives an individual to have a performance goal rather than a learning goal—applies predominantly to low involvement contexts. Similarly, Bullard et al.’s (2019) prediction—holding a fixed mind-set drives an individual to think less abstractly and be less flexible cognitively—might not apply to high involvement contexts.

The results contribute by providing an empirical investigation to the notion that people holding a growth (vs. fixed) mind-set are less influenced by persuasive attempts and social norms (Murphy & Dweck, 2016). They further contribute to the debate of whether it is advantageous for consumers to hold a growth mind-set. Research generally assumes that holding a growth (vs. fixed) mind-set is beneficial (H. W. Park et al., 2017). The results, however, show that in certain contexts, people holding a fixed mind-set would be better off. In a retail context, where the RS is optimized, holding a fixed mind-set would lead to better choices in less time. In low involvement situations, holding a fixed mind-set results in a seamless decision delegation and quality choices.
The advent of RS supported by artificial intelligence (vocal assistants such as Amazon’s Alexa and Apple’s Siri) increases the cases of delegating to machines and calls researchers to copiously scrutinize the latter notion.

**Implications for Online Retailers**

The results delineate an undesired impact for involvement on RS effectiveness. Practitioners are advised to devise methods that make the RS interaction more appealing for the highly involved shoppers. Practitioners would benefit from priming a fixed mind-set for their shoppers as this helps increase their compliance with the RS advice, particularly for low involvement products and contexts. Activating a mind-set can be performed by providing a short text. The use of such slogans as “our firm keeps evolving,” “adapt to fit your lifestyle,” and “...changing with you” were found to activate a growth mind-set, whereas the use of such slogans as “our firm is committed to...”, “our rock-solidness fits your lifestyle,” and “your ideals stay the same and our firm stays there with you” were found to activate a fixed mind-set (Yorkston et al., 2010). Activating a mind-set can also be achieved using visuals and movie excerpts (Jain et al., 2009), or using games and activities (H. W. Park et al., 2017). The consumption of certain products and brands also helps activate a mind-set (Murphy & Dweck, 2016).

The results have implications for the realm of international retail. Western populations have been linked to fixed mind-set. Stevenson and Stigler (1992) indicated that, compared with Western cultures’ emphasis on fixed intelligence and a strong role of ability, people in Eastern cultures believe in malleable intelligence and in the importance of effort. Therefore, practitioners should employ RS in Western cultures primarily for low-involvement situations and products. Alternatively, for Eastern cultures, other methods such as influencer marketing and loyalty programs can be helpful.

The results hold implications for policy makers and individual consumers. Priming a growth mind-set nullifies the heuristic-proneness effect, helping consumers choose with a minimum agentic influence. Holding a growth mind-set would be in the consumer’s best interest in cases where the RS are erroneous, insecure, or not optimized. While priming a growth mind-set would lessen RS effectiveness and increase overload, it drives decision-makers to take more objective and deliberate choices.

**Limitations and Future Research**

While participants were potential consumers recruited from a consumer panel, and while the study took place at a quasi-natural rather than lab environment, this research has limitations. It considered one product (mobile phones) in RS-Consumer context, thus the results should be verified for other products and contexts. For instance, work should verify the results for hedonic and experience products (e.g., drinks, candy bars) and services (e.g., investment, legal). This article gauged RS effectiveness using compliance with RS advice in a hypothetical situation; work that measures effectiveness using other factors at realistic situations (e.g., employing renowned RS such as Amazon and MyProductAdvisor) is needed. This research used single method (questionnaire) to measure the variables; however, the measure of RS compliance was observed and several steps were implemented to alleviate sources of common method bias.

Social psychology research reports a moderate relation between the activated mind-set and need for cognition (Chiu et al., 1997); our results elucidate this relationship by signifying involvement as instigator. When the focal object is of particular interest, elaborative processing (gauged by need for cognition) seems to surge for people with fixed mind-set—a notion that merits further examination. Activating a specific mind-set to enhance RS compliance is relevant to social marketing (e.g., to reduce the consumption of tobacco products and unhealthy foods). The ethical aspect surrounding nudging consumers to comply with recommendations using their activated mind-set should be elaborated. These topics outline future research opportunities.

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