Ingredient or Function?
The Influence of Product Recommendation Terms on Consumer Attitudes

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ABSTRACT

More and more brands are utilizing online word-of-mouth recommendations to promote their products and using product ingredients more widely in marketing communications. However, no research has explored how recommendation terms (ingredient vs. function) for functional products affects consumers’ attitudes. Through one pilot study and four experiments, it was found that consumers hold the lay belief that “ingredient = professional.” For functional products, consumers’ purchase intentions and product evaluations are higher when ingredient (vs. function) are labelled, with perceived trustworthiness playing a mediating role. In addition, the domain knowledge of the information sender moderates the focal effect. Theoretically, this research contributes to the literature on both lay beliefs and word-of-mouth marketing by proposing a new lay belief, and by exploring the effect of recommendation terms on consumers’ attitudes. Practically, this research can guide marketers in the appropriate use of product ingredient for word-of-mouth marketing.

KEYWORDS

Functional Products, Perceived Trustworthiness, Product Evaluation, Product Ingredient, Purchase Intention, Word-of-Mouth Recommendations

INTRODUCTION

Marketers are increasingly utilizing product ingredients as a method to promote product functionality, with the ultimate goal of influencing consumer perceptions and purchase intentions. “Niacinamide,” for instance, is mentioned to highlight the whitening properties of cosmetics, and “resveratrol” is mentioned to highlight the anti-aging properties of pharmaceuticals. Research has shown that functional products in many categories, such as cosmetics, health products, and personal care products, have begun to emphasize the role of product ingredients (Lellis, 2016; Xu & Wyer, 2010). In addition,
with the popularity of social media, brands promote their products or services through online word-of-mouth recommendations via users on social media (Ki & Kim, 2019). This type of recommendation has become an efficient new marketing tool due to its viral speed of information dissemination (Stubb et al., 2019). However, to the best of our knowledge, no research has been conducted to investigate the application of product ingredients in the online word-of-mouth recommendation context. With this background, influencer approaches to content output, such as whether to use functions or ingredients as recommendation terms for functional products, are supposed to influence consumers’ purchase intentions and product evaluations, but little research has paid attention to them.

Based on this premise, this research intends to delve deeper into the aforementioned issues. Research on lay beliefs shows that when two things in life frequently occur at the same time, individuals will gradually establish a connection between them, leading to the formation of lay beliefs (Zane et al., 2020), which is a very important consumer cognitive schema. This research proposes that because ingredients often co-occur with professional-related concepts (e.g., people with professional knowledge, professional content), consumers will hold a lay belief that “ingredient = professional.” Consumers will therefore rely on the lay belief of “ingredient = professional” in the context of online word-of-mouth. In other words, labeling the ingredients of a product will cause consumers to perceive the content of word-of-mouth information more related to the concept of “professional” than directly labeling the functions of a product. This will increase the consumers’ perceived trustworthiness of the information sender and the content of the message, which in turn increases purchase intention and product evaluation. In addition, when the domain knowledge of the information sender is high, consumers rely on the trustworthiness of the sender to make their judgments, independent of the recommended terms. Conversely, when the domain knowledge of the information sender is low, consumers perceive a mismatch between the low domain knowledge of the sender and the high domain knowledge required to label ingredients, resulting in lower purchase intentions and product evaluations.

This research first verified the existence of the lay belief that “ingredient = professional” in consumers’ minds by using two implicit measurement methods in a pilot study. Then, Study 1 tested the main hypothesis that labeled ingredients trigger higher purchase intention than labeled functions in word-of-mouth recommendations. Study 2 verified the mediating role of perceived trustworthiness. Study 3 extended the effect of recommendation terms from purchase intention to product evaluation and reaffirmed the mediating role of perceived trustworthiness. Study 4 demonstrated the moderating effect of the domain knowledge of the information sender.

This research has certain novelties and contributions. From a theoretical perspective, firstly, this research proposes and validates the lay belief that “ingredient = professional” based on the frequent co-occurrence of ingredient and professional-related concepts, which is a new and unexplored lay belief and a major innovation of this research. Secondly, this research is the first research to explore how recommendation terms (ingredient vs. function) influence consumer attitudes towards functional products in an online word-of-mouth context. This is another innovative point of this research and contributes to the literature on factors influencing online word-of-mouth persuasiveness. Thirdly, this research identifies an important boundary condition for recommendation terms to work, the domain knowledge of the information sender, which advances the literature on online word-of-mouth and domain knowledge. From a practical perspective, this research provides marketers with viable practical guidance on how product ingredients should be properly used to amplify functional products in online word-of-mouth recommendations.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

Online Word-of-Mouth Recommendation

Consumers are often inclined to buy products recommended by others in the buying process in order to make efficient and rational decisions (Smith et al., 2005). Word-of-mouth recommendation,
in which people communicate information about a product, brand, or service to others for non-commercial purposes (Arndt, 1967), is an important source of information for consumers to receive recommendations. Word-of-mouth plays a significant role in determining consumer attitudes and purchase decisions since it is a kind of interpersonal communication rather than advertising (Moon et al., 2017). With the advent of Internet commerce, the rise of online platforms such as social media (e.g., Facebook, Twitter, Weibo, and Xiaohongshu), online shopping platforms (e.g., Amazon, Taobao), and question-and-answer online communities (e.g., Zhihu and CSDN; Metzger & Flanagin, 2013), word-of-mouth recommendation has shifted from traditional word-of-mouth to online communication (Hennig-Thurau & Walsh, 2003). Online word-of-mouth refers to comments made either favorably or unfavorably about a product and disseminated via online media (Thorson & Rodgers, 2006). These online platforms facilitate consumer discussions about products and brands (Wolny & Mueller, 2013), and these online platforms also facilitate brands, influencers (e.g., opinion leaders), and consumers to distribute product-related content (Barreda et al., 2015), that have been found to affect consumer purchasing decisions significantly (Schlosser, 2011; Wang et al., 2012).

Recommendation System and Recommendation Content

Existing research has focused on two dimensions of online word-of-mouth recommendations: recommendation systems and recommended content (e.g., Resnick & Varian, 1997; Ma & Ding, 2018). On the one hand, some research has focused on recommender systems, i.e., learning from large-scale population data to achieve user group feature matching, thus helping users to effectively identify content of interest from large amounts of data (Resnick & Varian, 1997). In reality, recommendation systems are still widely used in applications other than online word-of-mouth recommendations, including ordering tools, self-replenishment technologies, automatic meal planning, online social networks, etc. Specifically, Ramadan et al. (2019) found that Amazon Prime Now, an online ordering tool that promises same-day delivery, increased consumer satisfaction and led to a trusting relationship between consumers and retailers. Farah et al. (2020) discussed the impact of the introduction of self-replenishment technology devices on consumer behavior. The findings suggest that self-replenishment technology will not replace traditional shopping media, but its use depends on consumer brand loyalty and overall consumer lifestyles. Salloum and Tekli (2022) introduced an automatically generated meal plan recommendation called MPG, which can take into account both calorie intake and patient preferences such as food preferences, food variety, and compatibility between foods. Finally, Arafeh et al. (2020) proposed a new sampling framework for online social network data that can be used to help build recommendation systems based on ontology.

On the other hand, the part of the research that is more relevant to consumer behavior focuses on recommendation content, i.e., the specific content of word-of-mouth recommendation messages, including text, images, and videos (Ma & Ding, 2018; Fan et al., 2021). Research shows that the characteristics of word-of-mouth recommended content, including emotion, interestingness, professionalism, reliability, richness, quality, and relevance, all have an impact on the attitude or behavior of information recipients (e.g., Brodie et al., 2013; Yin et al., 2014; Wakefield & Bennett, 2018). Indeed, the essence of a recommendation system is an information filtering system, and the recommended content is the important factor that influences the final decision of the consumer.

Trustworthiness of Online Word-of-Mouth Recommendations

Based on the Source of the Information

Consumer trust determines how online word-of-mouth recommendation affects their attitudes and purchasing intention. Research suggests that information receivers judge the trustworthiness of online word-of-mouth recommendations by the source and content of the information (Rieh & Danielson, 2007; Choi & Rifen, 2002). Trustworthiness based on the source of information is more influential to the receiver than the content of the information (Phua et al., 2018). Source credibility can be defined as credibility based on the expertness and trustworthiness of the information sender (Hovland &
Weiss, 1951). *Professionalism* refers to the extent to which the communicator is perceived to be able to provide valid and accurate information, and *trustworthiness* refers to the extent to which the recipient perceives the communicator to be willing to provide the truth (Hovland & Weiss, 1951). Source credibility plays an important role in the persuasion process, and the higher the source credibility, the more likely the recipient is to be persuaded, given the same message content (Hovland & Weiss, 1951; Rieh & Danielson, 2007). Certain aspects of online word-of-mouth, such as source type (Hilligoss & Rieh, 2008), sponsor disclosure (Hwang & Jeong, 2016), characteristics of the sender (Nikolinakou & Phua, 2020), and expertise of the sender (Wang & Scheinbaum, 2018) will affect source credibility.

**Based on the Content of the Information**

In fact, online word-of-mouth is different from traditional word-of-mouth, which usually occurs between familiar individuals, while online word-of-mouth occurs between individuals who have no common connection (Metzger & Flanagin, 2013). As a result, in the context of online word-of-mouth, information recipients frequently struggle to comprehend the knowledge and expertise of the information sender, making it challenging to rely on the source’s credibility to determine whether the word-of-mouth information is reliable or not. Therefore, information recipients tend to rely more on the cues in the information content to make their judgment (Wang, 2001). Signal theory can account for this cue-based behavior of trust judgments. The main principle of signal theory is that buyers can use information provided by sellers as signals to infer the validity of seller and seller states (Kirmani & Rao, 2000). Information senders might purposefully offer certain information signals, including social or content characteristics, in the context of online word-of-mouth to influence consumer trust, purchase intentions, and product evaluations (Cheung et al., 2014).

**Functional Products**

Previous studies distinguished functional products from hedonic products (Batra & Ahtola, 1991). Functional products refer to products that can meet specific consumer tasks or necessities of life, such as skin care products and hard drives (Botti & McGill, 2011); while hedonic products refer to products that can meet consumers’ inner emotional needs, such as snacks and entertainment films (Salerno et al., 2014). In terms of decision evaluation and purchase motivation, the two categories of products differ from one another. The consumer interests in purchasing functional products depend on whether they can complete specific tasks, and consumers will be satisfied with products that meet or exceed their functional requirements (Chitturi et al., 2008; Baltas et al., 2017). Therefore, when consumers choose functional products, their decision-making behaviors will be more rational, and they will pay more attention to dimensions such as product function and value (Ran & Zheng, 2017). In contrast, consumer interest in purchasing hedonic products stems from the pleasure generated during the shopping experience, and consumers are willing to seek experiences of happiness and enjoyment (Moore, 2015; Yang et al., 2016). Therefore, when consumers choose hedonic products, their decision-making behaviors will be more perceptual, and they will pay more attention to the appearance, attractiveness, and pleasantness of products (Yim et al., 2014). However, few studies focus on how to better convey the function and value of functional products in the context of online word-of-mouth.

**Communicating Function With Ingredients**

According to research, emphasizing product ingredients can better convey the benefits of functional productions. Product ingredients are increasingly used in marketing communications, and marketers often describe the specific ingredients and research and development production process of products on promotional slogans, product packaging, and brand websites (Lellis, 2016). Especially in the field of food health, consumers are generally interested in product ingredients while purchasing products (Grunert & Wills, 2007). In the category of functional products, consumers are also paying more and more attention to the ingredients of cosmetics, and consumers will prefer cosmetics that do not
contain certain ingredients (Xu & Wyer, 2010). For example, consumers will deliberately avoid preservatives such as parabens when shopping for cosmetics. As a result, companies using such preservatives are gradually changing their product ingredients and even removing cosmetics containing such preservatives from shelves (Xu & Wyer, 2010). It is clear that emphasizing the ingredients of functional products can be particularly important in the context of online word-of-mouth.

The “Ingredient = Professional” Lay Belief

In order to understand consumers’ attitudes towards the use of product ingredients in online word-of-mouth, we explored consumers’ lay beliefs about product ingredients. Lay Beliefs are common sense explanations that people have about themselves and the outside world (Molden & Dweck, 2006; Schwarz, 2004), such as “beauty = good” (Wan et al., 2017), “ethical products = less strong” (Mai et al., 2019), “distraction = interest” (Zane et al., 2020), “multiple payment channels = commercialization” (Ran et al., 2021), “the scientific process = cold” (Avivia et al., 2022). When information is incomplete or the source credibility is low, individuals often form mental perceptions from accessible subtle cues and rely on lay beliefs to form meaningful inferences about these mental perceptions, which influence their perceptions and attitudes (Schwarz, 2004; Zane et al., 2020). For example, Zane et al. (2020) found that when a stimulus distracted people from a task, they inferred that the stimulus was interesting based on the lay belief that “distraction = interest,” which led to a positive evaluation. In the field of consumer behavior, previous research has demonstrated that lay beliefs can have an impact on consumers’ judgments about various products (Cheng et al., 2017; Deval et al., 2013; Wang et al., 2010), even if these beliefs are not necessarily objectively accurate (Haws et al., 2017; Kramer & Block, 2011).

We propose that in online word-of-mouth contexts, consumers rely on the lay belief that “ingredient = professional.” Labeling product ingredients makes consumers perceive the content of word-of-mouth messages as more professional than directly labeling product functions. Lay beliefs are mainly derived from personal experiences and observations of the outside world (Kyung et al., 2017; Mai et al., 2019). Individuals gradually build a relationship between two occurrences in life that regularly happen together, leading to the formation of lay beliefs (Zane et al., 2020). People with extensive domain knowledge typically use chemical names when expressing very specialized content because product ingredients are typically very complex chemical names. Therefore, in online word-of-mouth contexts, consumers may hold the lay belief that “ingredient = professional,” as ingredients are frequently associated with professional-related concepts.

Ingredients and Consumer Attitudes Based on the Lay Belief That “Ingredient = Professional”

In the online word-of-mouth context, for functional products, the recommendation terms used by the information sender (ingredient vs. function) can impact consumers’ perceived trustworthiness and thus influence purchase intentions and product evaluations. Unlike traditional word-of-mouth recommendations, which are often sourced from close acquaintances, online word-of-mouth recommendations often come from anonymous senders. It is difficult for consumers to rely on the source’s credibility to determine whether the recommendation is trustworthy (Park & Lee, 2009). According to signal theory, when the source credibility is low, the buyer will use the characteristics of the content of the information provided by the seller as a signal to infer whether the information is trustworthy (Kirmani & Rao, 2000; Dimoka et al., 2012). Therefore, when consumers are approached with online word-of-mouth recommendations, they pay particular attention to the content of the recommendation information, especially the recommendation terms used by the recommender, and use the recommendation terms as signals to infer the authenticity and validity of the information.

On the basis of the lay belief that “ingredient = professional,” customers will perceive ingredient labeling for functional products to be significantly more professional than direct function labeling. Additionally, consumers give significant weight to the functionality and functional expertise of the
products when making purchase decisions since their interest in purchasing functional products depends on the products’ capacity to meet specific task needs. (Ran & Zheng, 2017; Baltas et al., 2017). Therefore, we believe that the professionalism of the recommendation information will enhance the perceived trustworthiness of the sender and the content of the message. It is helpful for consumers to believe that the content of online word-of-mouth recommendations is accurate and trustworthy, thereby improving purchase intention and product evaluation. In summary, this research puts forward the following hypotheses:

**Hypothesis 1 (H1):** In online word-of-mouth contexts, for functional products, labeling ingredients leads to higher purchase intentions and product evaluations by consumers compared to labeling functions.

**Hypothesis 2 (H2):** Perceived trustworthiness mediates the effect of recommendation terms (ingredient vs. function) on purchase intention and product evaluation.

**Moderating Role of Domain Knowledge**

The influence of recommended terms used by the information sender on consumers’ purchase intention is moderated by the domain knowledge of the information sender. On the one hand, research on trust demonstrates that in the context of online word-of-mouth, source credibility has a stronger influence on the information recipient than assessments based on trust cues (Phua et al., 2018). Therefore, regardless of whether the recommendation terms used by the information sender are ingredients or functions, consumers will directly judge the source to be more trustworthy based on that domain knowledge and thus have a higher purchase intention when the information sender has a high level of domain knowledge for a functional product (Hovland & Weiss, 1951). On the other hand, research on lay beliefs shows that information persuasiveness decreases when its attributes conflict with lay beliefs held by consumers (Haws et al., 2017). Therefore, when the information sender has low domain knowledge, compared to the labeling function, consumers will perceive a mismatch between the low domain knowledge owned by the information sender and the high domain knowledge required for the labeling ingredient, resulting in lower purchase intentions and product evaluations. Based on this, this research proposes the following hypothesis:

**Hypothesis 3 (H3):** Information senders’ domain knowledge moderated the effect of recommended terms on purchase intention and product evaluation. There was no significant difference in purchase intention and product evaluation between labeled ingredients and labeled functions when information senders had high domain knowledge, while labeled functions had higher purchase intention and product evaluation than labeled ingredients when information senders had low domain knowledge.

**Overview of the Studies**

These hypotheses were tested across five studies (one pilot study and four laboratory experiments). The pilot study utilized two implicit measurement methods (object matching task and word association task) to verify the existence of lay beliefs in consumers’ minds that “ingredient = professional.” Study 1 validated the main hypothesis of this research that labeled ingredients can trigger higher individual purchase intention than labeled functions in online word-of-mouth recommendations (i.e., H1). Study 2 verified the mediating role of perceived trustworthiness (i.e., H2). Study 3 extended the effect of recommendation terms from purchase intention to product evaluation, examining the effect of recommendation terms on purchase intention and product evaluation, respectively, and revalidating the mediating mechanism of perceived trustworthiness. Lastly, Study 4 examined the moderating effect of the domain knowledge of the information sender (i.e., H3). That is, there was no difference in purchase intention and product evaluation
between labeled ingredients and labeled functions when the information sender had high domain knowledge, while labeled functions had higher purchase intention and product evaluation than labeled ingredients when the information sender had low domain knowledge. The empirical model is presented in Figure 1, and we summarize these findings in Table 1.

Figure 1. The empirical model

Table 1. Overview of the studies

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<td>—</td>
<td>—</td>
<td>Frequency of use</td>
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<td>F (1, 197) = 5.19, p = 0.024</td>
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<td>Perceived trustworthiness</td>
<td>Frequency of purchase</td>
<td>Purchase Intention</td>
<td>F (1, 118) = 5.13, p = 0.025</td>
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<td>Lifting and firming cream</td>
<td>200</td>
<td>—</td>
<td>Perceived trustworthiness</td>
<td>—</td>
<td>Purchase Intention</td>
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<td>Study 4</td>
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<td>F (1, 390) &lt; 1, p = 0.877, F (1, 390) = 11.47, p = 0.001</td>
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<td>Product evaluation</td>
<td>F (1, 390) = 6.37, p = 0.012</td>
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PILoT STU dy: VeRIFy THe LAy BELIEF oF “INGR edIeNT = PR oFESSIONAL”

The pilot study verified that the lay belief of “ingredient = professional” is widely existing in the minds of consumers, which supports the premise logic of this research. Specifically, we use two implicit measurement methods, the object matching task and the word association task, to measure the lay belief of “ingredient = professional” (Ran et al., 2021). First, the process of the object matching task was to let the participant imagine a certain situation, and then let him choose the object that matches the situation. Because individuals process stimuli that match lay beliefs more quickly and feel more reasonable (Higgins, 1996; Mai et al., 2019). Second, the process of the vocabulary association task was first to show the participant the target vocabulary, and then ask which words to choose that are more likely to be associated with the target word. We predicted that labeling ingredients will be perceived as better matched to professional objects and associated with more words related to the concept of “professional” than the labeling function.

Method

The pilot study adopted a single factor (recommended term: ingredient vs. function) between-subject design experiment. We recruited 100 participants, divided into two groups of 50 each, to participate in this online experiment through the data mart on the Credamo platform (a general online subject pool). Of these, 53.0% were female and the age range was 18 to 55 years ($M = 27.69, SD = 6.59$). Upon entering the experiment, participants are assigned to perform the following two tasks in sequence.

The Vocabulary-Website Type Matching Task

Participants were first told that the next set of words they saw were real words that appeared on a website. Participants in the ingredient condition saw the words “10-hydroxydecanoic acid, mucopolysaccharide polysulfate, hydroxy cumene glycosides” and those in the function condition saw the words “fast acne removal, pore unblocking, acne mark reduction.” The participants were then asked to guess the most likely and least likely websites for this set of terms from a controlled selection of four websites. There were four websites to choose from: the official website of the Journal of Chemistry, the official website of Ruili Fashion and Beauty Magazine, the official website of the Chinese Journal of Integrative Medicine, and the official website of Fashion Bazaar. Among them, the official websites of the Journal of Chemistry and the Chinese Journal of Integrative Medicine are academic journals, which are typically highly specialized websites, while the official websites of Ruili Fashion and Beauty Magazine and Fashion Bazaar are typically less specialized websites.

The Vocabulary Association Task

First, participants were presented with 3 target words and 16 alternative words. Afterward, participants were asked to select the four words that were most closely associated with the target vocabulary out of the 16 alternatives. In this task, both conditions of participants saw the same target words as in the website type matching task. The 16 alternatives included 8 words related to the concept of professional (drill, complex, proficient, thesis, professor, insider, doctor, scalpel) and 8 words related to the concept of non-professional (browsing, simple, slight knowledge, magazine, enthusiast, amateur, make-up artist, eyebrow trimmer), which corresponded to each of the two groups of words. Finally, participants reported demographic information such as gender and age and made guesses about the purpose of the experiment.

Results

The descriptive results of the pilot study are shown in Table 2.
The results of the chi-square test showed that participants generally perceived that ingredient words (44/50, 88.0%) were more likely to be found on more professionally requested sites than function words (13/50, 26.0%), $\chi^2 (1) = 39.21, p < 0.001, \phi = -0.63$, lower than -0.50, with a larger effect size (Cohen, 1988). At the same time, participants generally perceived that ingredient words (5/50, 10.0%) were less likely to appear on less professionally requested sites than function words (39/50, 78.0%), $\chi^2 (1) = 46.92, p < 0.001, \phi = 0.68$, with a larger effect size.

**Vocabulary Association Task Results**

We marked words related to the concept of *specialization* as 1 and words related to the concept of *non-specialization* as -1, and the total score of the participants’ vocabulary choices was used as an indicator of specialization. The higher the score, the higher the degree of association with specialization. A single-factor ANOVA was conducted with the specialization indicator as the dependent variable. The results showed that participants were more likely to associate the ingredient vocabulary ($M_{ingredient} = 2.92$, $SD = 1.52$) with words related to the concept of specialization than the function vocabulary ($M_{function} = -0.12$, $SD = 2.50$), $F (1, 98) = 53.79, p < 0.001, \eta^2 = 0.35$. The effect size was larger according to Cohen’s (1988) higher effect size criterion of 0.14.

**Discussion**

The pilot study used two measures to confirm the lay belief that “ingredient = professional,” supporting the logical premise of this research, and Study 1 will verify the effect of recommendation terms on consumer purchase intention.

**STUDY 1: THE IMPACT OF RECOMMENDATION TERMS ON PURCHASE INTENTION**

Study 1 aimed to test the basic hypothesis of this research, namely that labeled ingredients can trigger higher purchase intention among individuals than labeled functions in online word-of-mouth recommendations (i.e., H1).

**Methods**

Study 1 adopted a single factor (recommended term: ingredient vs. function) between-subjects design experiment. We recruited 200 participants, divided into two conditions of 100 each, to participate in the online experiment through the data mart on the Credamo platform. Each participant was paid in cash at the end of the experiment. Of these, 147 (73.5%) were women, aged 19 to 51 years ($M = 30.04, SD = 8.75$).

First, the participant was asked to imagine that she was browsing Xiaohongshu, a widely used online word-of-mouth recommendation platform in China, when she came across a blog post (see
Web Appendix 1) by a blogger recommending a lifting and firming face cream. In the condition of the ingredient term, the blog post is illustrated with the group of ingredients “oligopeptide-2, acetyl hexapeptide-8, palmitoyl tetrapeptide-7.” In the condition of the functional term, the article is illustrated with the group of functions “anti-aging, reduces the appearance of lines, lifts the jawline.” Participants’ purchase intentions (1 = would not, 7 = would) were then measured: “Would you purchase this product?” (Verhagen & Dolen, 2009). In addition, to control for the effect of the experience of use, we measured the frequency of use of the product by the participants: “How often do you usually use anti-aging supplements?” (1 = never used, 7 = used regularly). Finally, participants filled in demographic information such as gender and age and made guesses about the purpose of the experiment.

Results

A one-way ANCOVA was conducted with purchase intention as the dependent variable and frequency of use as the control variable. The results showed that participants who saw the ingredient term (M_{ingredient} = 5.24, SE = 0.11) were more likely to purchase the recommended product compared to those who saw the functional term (M_{function} = 4.87, SE = 0.11), \( F(1, 197) = 5.19, p = 0.024, \eta^2 = 0.03, \) supporting H1.

Discussion

Study 1, utilizing a lifting and firming face cream as the experimental material, verified that participants were more likely to purchase the recommended product when presented with the ingredient term compared to the functional term, providing support for the underlying hypothesis of this research. Next, Study 2 explored the mediating mechanism of the focal effect.

STUDY 2: THE MEDIATING ROLE OF PERCEIVED TRUSTWORTHINESS

Study 2 replicated our main effect (i.e., H1) that participants were more likely to purchase the recommended product when presented with the ingredient term compared to the functional term. More importantly, this study examined the possible mediating effect of perceived trustworthiness as we have proposed (i.e., H2).

Methods

Study 2 adopted a single factor (recommended term: ingredient vs. function) between-subjects design experiment. We recruited 121 participants, divided into two conditions, to participate in the online experiment through the data mart on the Credamo platform. Each participant was paid in cash at the end of the experiment. Of these, 81 (66.9%) were women, aged 18 to 56 years (\( M = 29.45, SD = 7.83 \)).

The procedure was similar to that of Study 1. The focal product was changed into an acne serum (see Web Appendix 2 for pictures presented). The study began with the manipulation of recommendation terms. The participant was asked to imagine that he or she was browsing Xiaohongshu and saw a blog post by a blogger recommending an acne serum. In the context of the ingredient term, the blog post was illustrated with a set of ingredients labeled “mucopoly saccharide polysulfate, 10-hydroxydecanoic acid, hydroxy cumene glycosides.” In the condition of the functional term, the article is illustrated with a set of functions “fast acne relief, unblocking pores, reducing acne marks.” Participants’ purchase intentions (1 = unwilling/would not/unlikely/improbable, 7 = willing/would/likely/probable; \( r = 0.78 \)) were then measured (“Would you purchase this product?”; Verhagen & Dolen, 2009), as well as perceived trustworthiness (“I think the information conveyed in the above blog post is trustworthy,” 1 = strongly disagree, 7 = strongly agree; Lee et al., 2010). In addition, the frequency of participants’ purchases of this type of product was measured: “How often do you usually buy acne products?” (1 = never bought, 7 =

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often bought). Finally, participants filled in demographic information such as gender and age and made guesses about the purpose of the study.

Results

Purchase Intention

A one-way ANCOVA was conducted with purchase intention as the dependent variable and frequency of purchase as the control variable. The results showed that participants who saw the ingredient term ($M_{\text{ingredient}} = 5.18, SE = 0.16$) were more likely to purchase the recommended product compared to those who saw the functional term ($M_{\text{function}} = 4.66, SE = 0.16$), $F (1, 118) = 5.13, p = 0.025, \eta^2 = 0.04$, supporting H1.

Perceived Trustworthiness

A one-way ANCOVA was conducted on perceived trustworthiness, again using the frequency of purchase as the control variable. The results showed that participants perceived the information conveyed by blog posts labeled with ingredient terms ($M_{\text{ingredient}} = 4.78, SE = 0.17$) to be more trustworthy than those labeled with functional terms ($M_{\text{function}} = 4.07, SE = 0.17$), $F (1, 118) = 8.73, p = 0.004, \eta^2 = 0.07$.

The Mediating Role of Perceived Trustworthiness

This study examined the mediating role of perceived trustworthiness using the mediation analysis model of Preacher and Hayes (2008; Model 4, bootstrapping 5,000 times). The results show that perceived trustworthiness significantly mediate the effect of recommendation terms on purchase intention (indirect effect = -0.494, $SE = 0.169$, 95% CI: [-0.817, -0.147]), supporting H2.

Discussion

Study 2 replicated the effect of recommendation terms on consumer purchase intentions (i.e., H1) and verified the mediating role played by perceived trustworthiness in the recommendation term effect (i.e., H2). More specifically, labeling ingredients can increase the perceived trustworthiness of recommendations and, thus, product purchase intention, compared to labeling functions in word-of-mouth recommendations.

STUdy 3: THE EFFECT OF RECOMMENDATION TERMS ON PRODUCT EVALUATION

Study 3 extended the effect of recommendation terms from purchase intention to product evaluation, examining the effect of recommendation terms on purchase intention and product evaluation, respectively, and re-validating the mediation mechanism of perceived trustworthiness.

Methods

Study 3 adopted a single factor (recommended term: ingredient vs. function) between-subjects design experiment. We recruited 200 participants, divided into two groups of 100 each, to participate in the online experiment through the data marketplace on the Credamo platform. Each participant was paid in cash at the end of the experiment. Of these, 139 (69.5%) were women, aged 19 to 51 years ($M = 29.75, SD = 6.60$).

The procedure was similar to that of Study 1. First, the participant was asked to imagine browsing Xiaohongshu, a widely used word-of-mouth recommendation platform in China, and coming across a blog post (see Web Appendix 3) recommending a lifting and firming face cream. In the condition of the ingredient term, the blog post included the group of ingredients “oligopeptide-2, acetyl hexapeptide-8, palmitoyl tetrapeptide-7.” In the context of the functional term, the article included
the group of functions “anti-aging, fades lines and wrinkles, lifts the jawline.” Next, participants responded with a product evaluation (1 = bad/negative/dislike it very much, 9 = good/positive/like it very much; α = 0.90; Huang et al., 2013) and a purchase intention (1 = unwilling/would not/unlikely/improbable, 7 = willing/would/likely/probable; α = 0.94; Verhagen & Dolen, 2009). Afterward, perceived trustworthiness was measured (“I think the information conveyed in the above blog post is professional/trustworthy,” 1 = strongly disagree, 7 = strongly agree; Lee et al., 2010). Finally, participants filled in demographic information such as gender and age and guessed the purpose of the experiment.

**Results**

**Purchase Intention**

One-way ANOVA results showed that participants who saw the ingredient terms ($M_{\text{ingredient}} = 5.52$, $SE = 0.13$) were more likely to purchase the recommended product compared to those who saw the function terms ($M_{\text{function}} = 5.07$, $SE = 0.13$), $F(1, 198) = 5.64$, $p = 0.018$, $\eta^2 = 0.03$, again supporting H1.

**Product Evaluation**

Again, a one-way ANOVA was conducted on product evaluations, and the results showed that participants who saw the ingredient terms ($M_{\text{ingredient}} = 7.18$, $SE = 0.14$) rated the recommended product more highly compared to those who saw the function terms ($M_{\text{function}} = 6.75$, $SE = 0.14$), $F(1, 198) = 5.08$, $p = 0.025$, $\eta^2 = 0.03$.

**Perceived Trustworthiness**

A one-way ANOVA on perceived trustworthiness showed that participants perceived blog posts labeled with ingredient terms ($M_{\text{ingredient}} = 5.34$, $SE = 0.13$) as more trustworthy than those labeled with function terms ($M_{\text{function}} = 4.82$, $SE = 0.13$), $F(1, 198) = 7.97$, $p = 0.005$, $\eta^2 = 0.04$ (see Figure 2).

**The Mediating Role of Perceived Trustworthiness**

This study examined the mediating role of perceived trustworthiness using the Preacher and Hayes (2008) mediation analysis Model 4 (bootstrapping 5,000 times) with purchase intention and product

![Figure 2. Effects of recommendation terms on purchase intention, product evaluation, and perceived trustworthiness](image-url)
evaluation as dependent variables, respectively. The results showed that perceived trustworthiness mediated significantly in the effect of recommendation terms on purchase intention (indirect effect = -0.438, SE = 0.163, 95% CI: [-0.774,-0.134]) and in the effect of recommendation terms on product evaluation (indirect effect = -0.432, SE = 0.155, 95% CI: [-0.738,-0.134]), again offering support for H2.

Discussion

Study 3 verified the effect of recommendation terms on purchase intentions and product evaluations, and again verified the mediating role of perceived trustworthiness, enhancing the external validity of the study.

STUDY 4: THE MODERATING EFFECT OF DOMAIN KNOWLEDGE

Study 4 was designed to affirm the moderating effect of domain knowledge (i.e., H3). That is, there was no difference in purchase intention and product evaluation between labeled ingredients and labeled functions when the information sender had high domain knowledge, while labeled functions had higher purchase intention and product evaluation than labeled ingredients when the Information sender had low domain knowledge.

Methods

A total of 400 participants were recruited from a general population subject pool via Credamo. This study adopted a 2 × 2 (recommended term: ingredient vs. function; domain knowledge: high vs. low) between-subjects design. Three participants not completing the attention check were excluded from data analysis (Oppenheimer et al., 2009), resulting in 397 valid data (M_age = 29.82, SD = 7.29; 68.8% female).

Similar to the previous experiment, participants were first asked to imagine seeing a blog post (see Web Appendix 4) recommending an anti-aging supplement while browsing Xiaohongshu. For the manipulation of recommendation terms, in the condition of the ingredient terms, the blog post illustrated that the product contained the group of ingredients “resveratrol, β-nicotinamide mononucleotide, pyrroloquinoline quinone.” In the context of function terms, the product is illustrated as having “anti-thrombotic, anti-aging, and free radical scavenging” functions. For the manipulation of domain knowledge, in the high domain knowledge scenario, participants were informed that the product recommendation was published by a health professional blogger with extensive health expertise. In the low domain knowledge scenario, the participants were told that the product recommendations were posted by a blogger who was a novice in health care and had little health care expertise.

Next, purchase intention and product evaluation were measured using the same questions as in Study 3. Afterward, participants were asked about their own domain knowledge (“Do you know anything about anti-aging supplements?” 1 = very unaware, 7 = very aware), Xiaohongshu browsing habits (“How often do you usually browse Xiaohongshu?” 1 = never, 7 = often), and the professionality of labeling ingredients (“Do you think labeling the product features in the blog post would make the post more professional?” 1 = very unprofessional, 7 = very professional). Finally, participants filled in demographic information such as gender and age and guessed the purpose of the experiment.

Results

Purchase Intention

A two-way ANOVA was conducted with purchase intention as the dependent variable and the participants’ own domain knowledge, frequency of browsing Xiaohongshu, and professionality of labeled ingredients as control variables. The results showed that the main effect of recommendation terms was significant (F (1, 390) = 5.29, p = 0.022), and the main effect of domain knowledge was
significant \( (F(1, 390) = 12.76, p < 0.001) \). Significantly, the interaction effect of recommendation terms and domain knowledge was significant \( (F(1, 390) = 6.31, p = 0.012) \). Planned contrasts showed that no significant differences in purchase intention were found between ingredient terms and function terms when information senders had high domain knowledge \( (M_{\text{ingredient}} = 4.86, SE = 0.12, M_{\text{function}} = 4.83, SE = 0.12; F(1, 390) < 1, p = 0.877, \eta^2_p < 0.001; \text{see Figure 3}) \). However, when information senders had lower domain knowledge, participants who saw function terms had higher purchase intentions compared to ingredient terms \( (M_{\text{ingredient}} = 4.12, SE = 0.12, M_{\text{function}} = 4.69, SE = 0.12; F(1, 390) = 11.47, p = 0.001, \eta^2_p = 0.03) \), supporting H3.

Product Evaluation

Similar two-way ANOVA results showed a non-significant main effect for recommendation terms \( (F(1, 390) = 2.12, p = 0.146) \) and a significant main effect for domain knowledge \( (F(1, 390) = 15.20, p < 0.001) \). Significantly, there was a significant interaction effect between recommended terms and domain knowledge \( (F(1, 390) = 4.54, p = 0.034) \). Simple effects analysis showed (see Figure 4) that no significant differences were found between product evaluation for ingredient terms and function terms when the Information sender had high domain knowledge \( (M_{\text{ingredient}} = 6.60, SE = 0.13, M_{\text{function}} = 6.51, SE = 0.13; F(1, 390) < 1, p = 0.630, \eta^2_p = 0.001) \). However, when the Information sender had lower domain knowledge, participants who saw the function term gave higher product evaluation compared to the ingredient term \( (M_{\text{ingredient}} = 5.81, SE = 0.13, M_{\text{function}} = 6.27, SE = 0.13; F(1, 390) = 6.37, p = 0.012, \eta^2_p = 0.02) \).

Discussion

The moderating effect of domain knowledge was verified in Study 4, using health products as stimuli. Specifically, when the Information sender’s domain knowledge was high, there was no difference between labeled ingredients and functions, while when the information sender’s domain knowledge was low, labeled functions were more likely to be purchased and rated as a product than labeled ingredients.

Figure 3. Moderating effect of domain knowledge on the effect of recommended terms on purchase intention
This research investigated the effect of recommendation terms (ingredient vs. function) on consumer purchase intention and product evaluation, as well as their underlying mechanisms and boundary conditions, in the context of online word-of-mouth recommendations for functional products, based on the lay belief that “ingredient = professional.” Through one pilot study and four laboratory experiments, it was found that: First, the lay belief that “ingredient = professional” is widely present in the minds of consumers (pilot study). Secondly, the purchase intention (Studies 1–3) and product evaluation (Study 3) of recommended products with labeled ingredients were higher for consumers compared to labeling functions in online word-of-mouth recommendations. Then, perceived trustworthiness mediated the effect of recommendation terms on purchase intention (Studies 2–3) and product evaluation (Study 3). Finally, the domain knowledge of the information sender moderated the effect of the recommendation terms on consumer purchase intention and product evaluation. When the domain knowledge of the information sender was high, there was no difference in the effect of labeled ingredients and labeled functions on consumer purchase intention and product evaluation, while when the domain knowledge of the information sender was low, labeled functions triggered higher purchase intentions and product evaluations than labeled ingredients (Study 4).

**Theoretical Contributions**

This research contributes to the development of multifaceted literature in the field of psychology and marketing. Firstly, this research proposes and validates a new lay belief that “ingredient = professional,” which is a major novelty of this research and broadens the scope of research on lay beliefs. In previous psychological research, scholars have explored the role of lay beliefs, such as “beauty = good” (Wan et al., 2017) and “scientific processes = cold” (Aviva et al., 2022). It is believed that it will affect consumer product evaluation, purchase intention, donation intention, and other aspects. However, no research has examined the lay beliefs related of consumers in relation to product ingredients. This research explored the use of lay beliefs in the field of online word-of-mouth and proposes that consumers will hold the lay belief of “ingredient = professional,” which influences consumer attitudes and behaviors.
Secondly, this research broadens the scope of considerations that influence consumer perceived trustworthiness of online word-of-mouth. In previous studies, scholars have often focused on online word-of-mouth source credibility, that is, judging the credibility of information based on the professionalism and trustworthiness of the disseminator (Hovland & Weiss, 1951), and have focused primarily on the factors that affect source credibility. For example, source type (Hilligoss & Rieh, 2008), sponsor disclosure (Hwang & Jeong, 2016), and the expertise of the sender (Wang & Scheinbaum, 2018). This affects the level of consumer trust in online word-of-mouth. It is worth noting that, unlike traditional word-of-mouth recommendations, which often come from close acquaintances, online word-of-mouth recommendations often come from anonymous senders, so it is difficult for consumers to rely on source credibility to determine whether the recommendation is trustworthy (Park & Lee, 2009). However, few studies have examined how consumers make trust judgments based on subtle cues when they cannot directly judge the trustworthiness of a source. Drawing on signal theory (Dimoka et al., 2012) and lay beliefs (Aviva et al., 2022; Ran et al., 2021), this research suggests that labeling product ingredients in online word-of-mouth is an important factor influencing consumer attitudes, this is another novelty of this research.

Finally, this research identifies the boundary conditions under which consumer psychology is influenced by recommended terms. This research argues that the influence of the recommendation terms used by the information sender on consumer attitudes is moderated by the domain knowledge of the information sender. On the one hand, based on research on trust, in online word-of-mouth contexts, source credibility has a greater impact on information recipients than judgments formed based on trust cues (Phua et al., 2018). We suggest that consumers directly judge a source as more trustworthy based on domain knowledge when the information sender has higher domain knowledge, and thus has higher purchase intentions, independent of the recommendation terms. On the other hand, based on research on lay beliefs, the persuasive power of a message decreases when the attributes of the message conflict with the lay beliefs held by the consumer (Haws et al., 2017). This research considers that when the information sender has low domain knowledge, a mismatch between the low domain knowledge possessed by the information sender and the high domain knowledge required to label ingredients rather than functions in the information content is perceived by consumers, leading to a reversal of the effect of the recommended terms.

Practical Implications
This research provides practical insights for companies and brands to conduct word-of-mouth marketing effectively. The results of this article show that for functional products, consumer purchase intentions and product evaluations are increased for recommended products with ingredients than for those with features in online word-of-mouth recommendations. Based on the lay belief that “ingredient = professional,” the use of ingredients as a recommendation term for functional products provides the consumer with a higher perception of professionalism, and word-of-mouth recommendation content is more trusted by consumers. Therefore, when businesses and brands want to promote functional products through online word-of-mouth marketing, they may think about including the ingredients in their recommendation messages.

However, businesses and brands need to pay close attention to the information sender’s domain knowledge when using ingredients for online word-of-mouth recommendations. This is due to the fact that the recommended terms’ effects are moderated by the information sender’s domain knowledge. Since source credibility has a greater impact on information receivers than judgments formed based on trust cues (Phua et al., 2018), when businesses or brands choose online word-of-mouth recommendations for marketing and promotion, in addition to selecting opinion leaders with a high level of domain knowledge, they can use a more practical method of maximizing the effect of word-of-mouth recommendations by inviting regular users to indicate product ingredients in their recommendations. Consequently, when companies or brands choose word-of-mouth recommendations for marketing and promotion, in addition to choosing opinion leaders with high domain knowledge,
they can also use a more cost-effective way to maximize the effect of word-of-mouth recommendations by using ordinary users to label product ingredients in their recommendations.

**Research Limitations and Future Directions**

There are some shortcomings in this research. First, in terms of research context, this research aimed to explore the effect of recommendation terms on consumer product evaluation and purchase intention in the context of online word-of-mouth recommendations. Future research could explore the different effects of product recommendation terms in other contexts, for example, whether the effects of recommendation terms also exist in the context of advertising, and product reviews. Such interesting questions need to be addressed in future research. Second, in terms of the object of research, this article only focused on the choice of recommendation terms for functional products. If future studies could explore both functional and hedonic products and compare the differences between the two types of products, the scope of application of the recommendation term effect could be broadened.

Third, in terms of the research question, future research could also consider the effect of culture on recommendation terminology. Some regional cultures are more inclined toward the analytical processing of information (Chu & Huang, 2017), and participants accustomed to processing information holistically (as opposed to processing it separately) are more likely to view product ingredients and product functions as a whole, with enough information diagnosable to form a perception of product specialization. Consequently, whether the findings of this article apply to the cultural contexts of these regions where analytical processing is dominant, remains to be explored in the future.

Fourth, in terms of research methodology, this research only conducted laboratory experiments and not field experiments, which has some ecological validity limitations. Future studies could conduct field experiments to enhance the ecological validity of the study. Fifth, in terms of technical interventions, this research only focuses on the effects of interventions on the content of online word-of-mouth recommendations on the recipients of the information. However, in addition to the content of the recommendation, the recommendation system is also an important factor that interferes with the effectiveness of online word-of-mouth recommendations (Resnick & Varian, 1997). Moreover, in reality, with the rapid development of information technology, recommendation systems are increasingly used on online shopping platforms and social media (Ramadan et al., 2019; Farah et al., 2020). Future research could explore the impact of different types of automated recommender systems on the effectiveness of online word-of-mouth recommendations.
REFERENCES


Nikolinakou, A., & Phua, J. (2020). Do human values matter for promoting brands on social media? How social media users’ values influence valuable brand-related activities such as sharing, content creation, and reviews. *Journal of Consumer Behaviour, 19*(1), 13–23. doi:10.1002/cb.1790


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