



Persuaded by Electronic Word of Mouth (eWOM): Network Coproduction Model on Chinese Social-Ecommerce App

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Abstract. In the era of Web 2.0 with prominent feature of user-generated content, the phenomenon of coproduction prevails in inter-consumer communication as well – consumers produce contents about product experience and evaluations to share and to support each other, rather than being passively influenced by marketers or key opinion leaders. The Little Red Book (LRB), a social-e-commerce unicorn in China, encourages users to share experience and opinion on cosmetic products and other aspects of life, even though it is a weak-tie community without much intimacy. This research revolves around the Network Coproduction Model of electronic Word of Mouth (Kozinets et al. 2010) and tries to test if eWOM of ordinary users can influence others' product attitude and purchase intention. Two variables of eWOM, self-disclosure and product price, are manipulated to design a 2 (self-disclosure: descriptive, evaluative) \times 2 (product price: high, low) factorial experiment. The researcher conducts an electronic experiment and a follow-up survey (N = 210) with 8 LRB prototype posts. The result indicates that LRB users mostly identify LRB as a supportive and honest community, even though they are not particularly active or involved here; product attitude and purchase intention are highly correlated; descriptive self-disclosure is more effective in persuading consumers than evaluative one is, and the combination of descriptive self-disclosure and high-cost product yields the most positive product attitude.

Keywords: Computer mediated communication · Electronic Word of Mouth (eWOM) · Self-disclosure · Social strength

1 Introduction

Growing grass (种草), a Chinese network buzzword, means that people are persuaded to favor a product either by celebrities or fellow consumers on social media. Little Red Book (LRB) or *XiaoHongShu*, a social-e-commerce unicorn in China, has maintained over 100 million users and raised over US\$300 million [1]. LRB is a user-centered instead of product-centered community, revolving around personal experience and opinion sharing on cosmetic product mainly and other aspects of life; intimacy is not a necessity here. Without credibility of celebrity or perceived intimacy shared within an interpersonal relationship, ordinary consumers on LRB can influence their peers' product attitude and purchase intention through electronic Word of Mouth (eWOM).

Recent researches have shown that peer communication can influence customer decision making either directly or indirectly [2–4].

The causal relation of product attitude and purchase intention can be explained by the Theory of Reasoned Action and Theory of Planned Behavior [5], where behavior can be predicted by intention and attitude, and intention is shaped by an individual's attitude. Therefore, the researcher suspects that users are able to alter attitude toward a project and therefore change their purchase intention.

From social network analysis perspective, the society is composed of strong and weak ties [6]. Variables determining the difference include frequency, reciprocity, intimacy, emotional intensity, multiplexity, etc. [6–8]. In this case, the researcher believes that LRB is a weak-tie community characterized by social eWOM, different from other social media where users maintain strong-tie relationships or from shopping websites with focus on affiliated eWOM, according to eWOM categorization initiated by Xu [9].

On such a weak-tie community like LRB, users perform many-to-many communication most of the time, even though one-on-one instant message is also enabled. Users contribute with their own stories and consume others' contents as well. This form of peer communication serves as a realistic scenario of Network Coproduction Model of eWOM – consumers are empowered by the Internet to become producers in their own network, although they are under the influence of marketer [10]. Adapted from Schramm's model of mass communication [11] to the eWOM field, three models of eWOM [10] picture how eWOM can be communicated. The organic inter-consumer influence model, corresponding to interpersonal communication, states that consumers communicate naturally without influence of marketers, which is motivated by organic desire to support; while the linear marketer influence models illustrates how key opinion leaders in consumer community directly inform and influence fellow consumers. Researches have been done to examine organic inter-consumer influence model (e.g. Pedersen, et al. 2014) [12] and linear marketer influence model (e.g. Samutachak and Li 2012) [13]. However, the network coproduction model has not been explored yet; even the definition of peer communication focuses on interpersonal communication instead of many-to-many model that prevails in virtual community [3].

The question remains, how do people form an attitude or even a decision based on an LRB post in a weak-tie community with full anonymity and little credibility? The researcher suspects that the content of the post shall be the key here, instead of the identity of the user, since in a network coproduction model, the consumers are treated identically without special focus on anyone in particular. From self-disclosure perspective, trust has been identified as an important factor mediating peer communication online, against concern of anonymity and credibility [4]. In the context of LRB, the researcher believes how users disclose personal information plays a role here. Personal information revealed is perceived as self-disclosure, which is classified into descriptive (DS) and evaluative (ES) ones [14]. Descriptive self-disclosure reveals personal facts about oneself, while evaluative ones are more about expressions of personal feelings and opinions. However, most of the researches are conducted from the perspective of the discloser, such as motivation; the effect of self-disclosure on the recipient has not been covered yet.

Apart from that users may respond to the post differently based on the level of self-disclosure, users proactively seek peer review to try to lower down the uncertainty and risk aroused by experience products. Laurent and Kapferer [15] have identified that consumers' involvement with product is determined by variables such as perceived risk, cost, and emotional appeal. Besides, familiarity with product would influence consumers' preference for sources [16]. Consumers would resort to eWOM to purchase services instead of physical goods [17]. Adopting Xu's classification [9], the researcher focuses on high-risk product with both high (HC) and low costs (LC), since LRB users mainly post and browse content related to high-risk product.

To fill the research gap and to understand how different aspects of self-disclosure in eWOM influences product attitude and purchase intention in a weak-tie community, the researcher designed a 2 (self-disclosure: descriptive, evaluative) \times 2 (product price: high, low) experiment to examine the effect of self-disclosure in eWOM on product attitude (PA) and purchase intention (PI).

2 Method

2.1 Pretest

Initially, 12 eWOM in three cosmetic categories (lipstick, make-up foundation, and serum) are adapted based on real eWOM on LRB. The researcher selected eWOM with strong DS or ES characteristics and categorize them based on product price. The content is modified in order to augment its characteristics and lessen potential confusion, as most contents on the platform contain strong subjective favors that may dilute self-disclosure effects. Still, the originality of the content is mostly preserved to optimize the authenticity of this experiment. Besides, photos attached with eWOM are also modified to produce simulated brands as predominated perception of existing brands would affect the result.

By using *Mockingbot*, the researcher developed 12 simulated eWOM about 12 different virtual brands. After pretest (N = 35), eight valid eWOM (2 in each factor) are selected for formal experiment. In the process, with feedback from first 12 participants, the eWOM was modified again to better eliminate confusion caused by imprecise wording and understanding confusion. It came to the researcher's attention that many pretest participants did not realize the difference between descriptive self-disclosure and product description, though the definition and example are provided. In this way, this particular difference was specified before later participants start the survey. Therefore, the researcher took into account both overall result and result after modification (Table 1).

2.2 Electronic Experiment

The researcher collected data with wjx.com paid sample service – wjx.com filters participants with three filtering questions and pay them with fixed amount by completing this experiment. In total of 401 people are exposed with filtering questions,

Table 1. Pretest Result

	Manipulated post with virtual product							
	Tarin foundation	Fresh herb serum	American beauty lipstick	Spiritual herb mask	Athena foundation	Elec Monc serum	Les deux foundation	Glory mask
Self-disclosure	1	1	0	0	1	1	0	0
Product Cost	L	L	L	L	H	H	H	H
Result 1–19	0.79	0.84	0.32	0.32	0.74	0.47	0.32	0.47
Result 20–32	0.92	0.85	0.31	0.46	0.62	0.77	0.31	0.08
Result 1–32	0.84	0.84	0.31	0.38	0.69	0.59	0.31	0.31

Descriptive Self-disclosure: 0

Evaluative Self-disclosure: 1

High Product Cost: H

Low Product Cost: L

leaving 210 valid samples to answer this survey. There are three parts in this experiment. In the first section, participants are asked to review eight eWOM content in random order and to eight-scale questions (mark: 1 to 8) on their personal experience after reviewing. The second section consists of questions regarding user behavior on LRB and perception of this community, while the last part revolves around demographic information of the participants.

Demographic Information

The data collected ($N = 210$) focuses on Chinese women who age 18 to 35 and are users of LRB. Here is a summary of demographic and behavioral information of participants: 12% participants have received an associate degree or below, 80% have received a bachelor's degree, and 8% have earned a master's degree and above. 24% are currently full-time students, others work mostly on management (11%), administration (10%) and finance (9%). More than half of the participants live in relatively affluent areas in China, including Guangdong (20%), Beijing (12%), Shanghai (10%), Jiangsu (7%), and Zhejiang (5%), which matches the geological distribution of LRB user base as well. 84% participants earn monthly income lower than ¥10,000 (\$1,484), and 89% spends less than ¥1,000 (\$148) on cosmetics monthly.

Social Tie Strength

By examining 9 questions on social tie strength, LRB users maintain a relatively weak-tie relationship ($M = 3.56$) with each other. Even though participants mostly perceive the community as mutually supportive ($M = 6.12$), their engagement is overall low in terms of multiplexity ($M = 4.90$), frequency ($M = 3.17$) and intimacy ($M = 2.77$). Therefore, the researcher believes that it corroborates the idea that LRB is a weak-tie community.

In addition to social strength related questions, all participants have used the LRB and 95% of them have been using the LRB for more than three months. 67% participants produce less than 5 posts every month, but 86% visit the LRB more than 6 times per month. Most participants perceive their experience on LRB as positive ($M = 6.19$) and helpful ($M = 6.43$), regarding this community as necessary ($M = 6.35$) and relatively honest ($M = 5.54$).

Product Attitude and Purchase Intention

This section of results is based on six questions about eight prototyped posts, where three questions in terms of satisfaction, pleasure and overall evaluation are used to indicate the tendency of attitude, while the others are intended for intention-related actions, including adding the product to Wishlist, shopping cart and buying it over the counter.

The following table summarizes the mean of product attitude and purchase intention with regard to four categories and relevant categories. Overall, PA and PI are highly correlated, and there is a causal relationship between PA and PI, as explained by the Theory of Reasoned Action.

3 Discussion

3.1 Social Tie Strength on LRB

Overall, social tie strength on LRB is weak, as indicated in Table 2. However, the results of behavioral and cognitive indicators are extremely different. First of all, most of the time, consumers are audiences and rarely post actively, which can be explained by the power law distribution, where 20% users contribute 80% of the content. This is why most participants score higher on the frequency ($M = 3.67$) of following, messaging and liking than that of the reciprocity ($M = 2.57$). Nevertheless, relatively high following and liking frequency indicates that users are actively following what is trendy on the LRB, even though they do not gain much interaction.

Information, instead of intimacy, is perceived as more important in the eyes of LRB users. Most users do not know many users in real life ($M = 2.28$), which suggests that this relationship is basically maintained online and separated from the offline life of most users. However, users do perceive this community as highly supportive ($M = 6.12$) and helpful ($M = 6.43$), even though the level of interaction and involvement is quite low. Therefore, it can be concluded that interaction is not a determinant in how users evaluate how helpful a community is, instead, how informative it can be is more significant here.

Low level of interaction and high level of belongingness coexist and are not contradictory because consumers expect to gain more useful information rather than interaction from such a community, even though these are two crucial indicators of social tie strength. The weak tie strength does not necessarily mean that it is a negative thing; on the contrary, it implies that it is necessary for consumers to have a place to honestly discuss about real experience with cosmetic products.

Last but not least, it is worth noticing that users believe the LRB is not particularly honest ($M = 5.54$) compared with their more positive evaluation of LRB ($M = 6.27$) in

Table 2. Social tie strength on LRB

Topic	Mean	Description
Following frequency	3.67	<i>How many LRB users are you following?</i>
Following reciprocity	2.37	<i>How many LRB users are following you?</i>
Messaging frequency	2.79	<i>How many direct messages do you send every month?</i>
Message reciprocity	2.68	<i>How many direct messages do you receive every month?</i>
Liking frequency	4.55	<i>How frequently do you like others' posts on LRB?</i>
Liking reciprocity	2.67	<i>How frequently do you receive likes from others?</i>
Multiplexity	4.90	<i>I talk with LRB users about topics other than cosmetics</i>
Intimacy	2.28	<i>I know LRB users in my real life</i>
Emotional intensity	6.12	<i>I think LRB is a mutually supportive community</i>

terms of necessity and usefulness. At the point of this research, LRB is crowded with advertisers and key opinion leader who mask themselves as ordinary users under no influence from marketers. Hence, ordinary users usually suspect the trustworthiness before believing in the information in the post.

3.2 The Effect of Self-disclosure and Product Cost

As indicated in Table 3, the product attitude toward the eight manipulated brands are relatively positive, which is purely generated by the post in the experiment, as users are never exposed to these brands before and therefore, there is no product attitude toward them. This is necessary to eliminate the external influence on the result. Besides, purchase intention is usually lower than the product attitude; this is probably because attitude is not the only determinant of intention, which is also influenced by financial status and current need, even though these two concepts are highly correlated.

Table 3. Correlation: product attitude & purchase intention

	Product attitude	Purchase intention	Correlation
DS × HC	5.80	5.28	.68
ES × HC	5.57	5.17	.81
DS × LC	5.70	5.47	.86
ES × LC	5.39	5.03	.82
DS	5.75	5.38	.79
ES	5.48	5.10	.83
HC	5.69	5.22	.74
LC	5.54	5.25	.86

DS: Descriptive Self-Disclosure

HC: High-cost High-risk Product

ES: Evaluative Self-Disclosure

LC: Low-cost High-risk Product

First of all, descriptive self-disclosure is much more effective in persuasion than evaluative self-disclosure with regard to both product attitude ($M_{DS} = 5.75$, $M_{ES} = 5.48$) and purchase intention ($M_{DS} = 5.38$, $M_{ES} = 5.10$). However, the difference of effect on product attitude and purchase intention is minimal, as indicated by the percentage of M_{DS} on M_{ES} ($M_{PA-DS}/M_{PA-ES} = M_{PI-DS}/M_{PI-ES} = 1.07$). One reason for this phenomenon is that descriptive self-disclosure is more informative and significant than evaluative self-disclosure, as consumers usually care how similar their situation are to that of others to determine how relevant a post about cosmetic product is. As it is discussed above, information is valued more by users, while evaluative self-disclosure revolving around personal feelings is not particularly pertinent or valuable.

Secondly, the difference between high and low product price is negligible ($M_{HC-PA} = 5.69$, $M_{LC-PA} = 5.54$, $M_{HC-PI} = 5.22$, $M_{LC-PI} = 5.25$). It can be noticed that high-cost product is related to better product attitude but lower purchase intention, which can be explained by the fact that higher price usually yields lower purchase intention for price-sensitive consumers. However, the limited absolute difference can probably be random and meaningless, so the explanation above may not be solid. But in the case of product attitude, there is an observable difference between high-cost and low-cost product. The researcher suspects that people tend to perceive expensive products as better in comparison with cheaper ones, which is why the product attitude is more positive in high-cost product. In conclusion, product price may not be particularly relevant in this case by analyzing it separately.

However, the effect of product price on purchase intention is much more conspicuous when self-disclosure and product price are analyzed together, especially in the case of descriptive self-disclosure. The percentage of M_{PI} on M_{PA} ($M_{PA-DSHC}/M_{PI-DSHC} = 1.10$, $M_{PA-DSLC}/M_{PI-DSLC} = 1.04$) and the correlation of M_{PI} and M_{PA} ($r_{DSHC} = 0.68$, $r_{DSLC} = 0.86$) indicate that high price stalls consumers' intention to purchase, even though the product attitude does not vary significantly ($M_{DSHC} = 5.80$, $M_{DSLC} = 5.70$). This phenomenon is understandable since consumers may not purchase products that they love due to economic reasons. This is particularly true in the case of descriptive self-disclosure is that descriptive self-disclosure is more persuasive and leads to more prominent attitude, but this preference cannot be supported by average user's financial condition, which leads to the gap between purchase intention.

This conclusion can also be corroborated by the correlation between PA and PI in terms of product cost ($r_{HC} = 0.74$, $r_{LC} = 0.86$), where low-cost products yield more consistent product attitude and purchase intention, whereas the correlation is weaker when it comes to high-cost product. It is also worth noticing that the correlation between PA and PI in terms of self-disclosure is consistent ($r_{DS} = 0.79$, $r_{ES} = 0.83$), which indicates that self-disclosure does not contribute to the discrepancy between PA and PI.

In conclusion, self-disclosure is effective in determining the level of product attitude, while product price is effective in determining purchase intention. Specifically, descriptive self-disclosure leads to better product attitude than evaluative self-disclosure, while high-cost product tends to generate discrepancy between product attitude and purchase intention.

4 Limitation

The limitation of this experiment lies in several aspects in the following.

First of all, it is impossible to control all variables involved. 4 posts are eliminated in the pretest in order to experiment with contents with most prominent self-disclosure features. However, the product category is not fully controlled – there are two foundations and two serums involved in evaluative self-disclosure, while there are one lipstick, one foundation, and two skin masks involved in descriptive self-disclosure. This asymmetry of product category may generate new variable that affects the final experiment result, which is also vulnerable to individual difference in terms of cosmetic need and personal preference. Nevertheless, the researcher believes that it is priority to control the level of self-disclosure since it is one of the independent variables in this research.

Secondly, self-reporting of participants online may not be very reliable and may be vulnerable to varied influences. For instance, the level of social tie strength may not be particularly accurate because of self-reported intimacy and perception. Another source of noise is the online questionnaire platform, wvx.com, since the platform filters the validity of participants with mandatory vetting questions, even though the researcher has asked the website to shut down the vetting process, but it is standard procedure on the platform.

The third limitation is about the limited size of test samples and the artificial process to manipulate samples. After pretest, only eight posts remain for formal experiment. It can be inaccurate as there are millions of posts on the LRB and merely eight posts may not be representative enough. Besides, in order to eliminate the pre-existing influence of existing brands, all of the posts are manipulated with fake brands and more prominent feature of the two types of self-disclosure. This can be problematic as unfamiliar brands probably indicate untrustworthiness and low quality, and manipulated contents may not genuinely reflect the real scenario on the LRB, which may make this research less significant.

5 Conclusion

The researcher demonstrated how different dimensions of self-disclosure and product costs affect consumers' product attitudes and purchase intention, and how PA and PI correlate with each other under the context of a weak-tie community. First of all, consumers believe a community such as the LRB where they share product-related experience is necessary and supportive, even though consumers may not be actively involved in the interaction, since information and usefulness are much more crucial here. Secondly, it can be noticed that consumers may not care about personal evaluations and emotions, but more about the product itself and similarities they share with others. This can be explained by the Theory of Reasoned Action and Elaboration Likelihood Model, as consumers process information rationally to make a decision or to form a perception. Besides, there is discrepancy between attitude and intention when it comes to different product price, as the latter is constrained to the power of consumption.

With this research, we are able to understand Network Coproduction Model of eWOM from the self-disclosure perspective and how consumers grow grass because of peer review. This case study provides an example of evaluating the effect of user-generated content and how people interact or perceive each other in many-to-many communication.

Future works may explore the following two aspects. First, researchers can scrape data from LRB or equivalent communities to conduct content analysis at massive scale so as to accurately analyze the characteristics of eWOM in a coproduction circumstance. Second, since commercial endorsers can camouflage as ordinary consumers to promote a brand or product due to anonymous features online, consumers nowadays are able to detect masking or deception as well. Researchers can explore how consumers detect deceptions and what characteristics give endorsers away. From these perspectives, we are able to understand human's online behavior in a more comprehensive manner.

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