



Article

Identifying Personas in Online Shopping Communities

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Abstract: Online shopping communities have emerged amid growing social shopping activities and involve user-centered online platforms that encourage user-generated content and interactions, such as reading and writing reviews, rating products, and sharing shopping experiences. However, similar to other online platforms and communities, online shopping communities face challenges to provide tailored content and support appropriate socialization to engage users and encourage individualized contribution within the communities. To provide unique, personalized support for each individual user, this study developed personas in online shopping communities based on their motivation for participation, as well as reading and posting behaviors. Based on the findings from 20 interviews and focus groups with 24 active online shopping community participants, we developed an online survey on MTurk to investigate the characteristics of the personas and received 194 valid responses. Four persona types emerge after the analysis of both the qualitative and quantitative data—Opportunists, Contributors, Explorers, and Followers.

Keywords: persona; social connection; social shopping; online community; user interaction

1. Introduction

Enabled by the growing use of online shopping and social media platforms, social shopping brings users a unique context of e-commerce [1]. Traditionally, online shopping has long been regarded as a solitary activity, but technological advancements have challenged and changed the way people search, compare, purchase, comment, and review products on online platforms [2]. This new form of online shopping allows for more types of user participation and interactions [3]. There are two major types of social shopping platforms identified in prior research studies: social media sites that incorporate commercial features, including advertisement and online transactions, and e-commerce websites that incorporate social features to support and encourage social interactions [4,5].

As an activity that people enjoy doing collaboratively [6] and part of the socialization process [7], the social attributes of shopping has led to increasing interpersonal social and collaborative activities on shopping topics, where people with similar shopping interests find each other and interact by exchanging information, knowledge, and experience on certain products and services [8]. Examples of such online shopping communities include retailer site communities (e.g., Best Buy Community Forum), deal-sharing communities (e.g., Slickdeals), online review forums (e.g., Laptop Mag), and social media shopping groups (e.g., Facebook Groups) [9].

Contrasting traditional online communities, user participation in online shopping communities largely depends on directed information flows among its members and the interaction with others, i.e., members' participation and contribution [10,11]. To date, many related academic studies on social shopping have focused on the impact of customer participation on consumer purchase decisions rather than examining the motivations that keep users participating in and contributing to the communities [12]. However, as indicated by Cheung et al. [11], "before companies can influence

customer purchase decisions through customer contribution in online social shopping platforms, they must first ensure that their customers are willing to participate and share comments and feedback with other customers.” Given the enormous potential of online shopping communities as both a business platform for marketing and a user-centric community for interpersonal interaction and socialization, the first step to a successful human-centered design of social shopping platforms and online communities for each user is to understand different types of users and what their needs are, as well as the level of willingness to engage in conversations and interact with others. Therefore, this study aims to explore the personalized motivation of user participation and contribution to identify various types of personas in online shopping communities.

Each user has unique needs in social shopping and the use of online shopping communities [13]. Some want to get flash deal information [14], some want opinions about their shopping interests [15], while others enjoy being a part of a community with people having similar interests [9]. These personal motivations and contexts may result in unique and complex user needs for personalized behavioral patterns of engaging in online participation and interaction with others on shopping topics, as well as making consistent contributions to online shopping communities. Based on our findings, this study presents personas representing varying user needs in their interactions with others, knowledge-contribution behaviors to the platform, and motivations of being part of the communities.

2. Background

2.1. Online Shopping Communities

Online communities, as a type of social formation on the Internet, utilize the power of technology to “connect individuals by providing unprecedented opportunities of social interaction and relationships development among people with shared interests irrespective of geography and time” [16]. As more purchases of products and services shift from offline to online platforms, online shopping is evolving from its roots as “a transactional exchange to a more relational exchange” [17]. Technological advancement has transformed online shopping, once regarded as a solitary activity, into collaborative social activities that embraces the innate human need to socialize [2]. As a result, many efforts have been made to replicate engaging community experiences that are typically associated with offline shopping, which customers “partially substitute shopping for recreation and use these activities to develop social activities and bonds with others” [18]. E-commerce retailers and social media sites have also recognized the important benefits of well-established online social shopping communities, including customer feedback, market research, creativity incubator, and self-perpetuating engine of brand loyalty [11]. The emerging online shopping communities facilitate interactions among users [13], provide more interpersonal interactions and shopping experiences [19], and is described as a great place to connect with other community members who share similar interests, give support, share information, and connect with fellow members [17]. As shopping becomes a more interpersonal, social, and collaborative activity [1], individual users exhibit various behavioral patterns and social needs. Therefore, to better support user interactions and address personal contexts in emerging online communities, our work explores how different types of users can be categorized socially and how to design artifacts that support their participation characteristics.

2.2. Persona

The word, “persona,” was originally used to describe an actor’s mask to clearly identify the characteristics of stereotypical personages [20], and then introduced to the area of analytical psychology to describe human personalities and behavioral patterns [21]. Personas have been studied in a number of disciplines, such as rhetoric [22], psychology [23], communication [24], and marketing [25]. In the field of human–computer interaction, the persona has become an established design technique to clarify user descriptions [26,27]. The technique helps designers focus on shaping a consistent user interface by making the user “present” in the design work [28], so as to explore the users’ behavioral patterns to the

system and specific user needs [29]. The use of persona has become widespread from communication with various stakeholders to guide design requirements and evaluate design artifacts [30]. As a useful method to understand user needs, motivations, and behavior patterns in terms of research possibilities and design implications, studying personas of online shopping communities can provide insights to identify various types of users on the platform and support a more personalized, enjoyable and effective design of such online user-centric communities.

Typically, a persona is drawn from multi-method research and crafts a holistic and empathetic view of the users [31]. However, there is no set rules for developing personas. Some researchers have suggested personas be developed strictly based on “sound field research” with methodological rigor and data [32], while others argue that personas can also come from the designers’ assumptions and experience in addition to “scientific” user studies [33], especially when those user study results require subjective interpretation beyond the objective observations [34].

With regard to the persona development process, Brickey et al. [35] summarize and suggest that “persona development teams typically pursue different approaches to developing personas, including which type of data to utilize. The various persona development approaches, however, generally share four steps”: (1) Identify target users, (2) Collect user data, (3) Group users into personas, (4) Create and present persona details. We follow the methodology of the persona development process, and focused on the first three stages [36]. As suggested by Mulder and Yaar [30], the grouping step (step 3) is critical to the effectiveness of the eventual personas because it should capture the needs of all users interviewed, identify key differences between users, and result in clusters that are easy to describe to system interface designers. In our work, we emphasize on online shopping community participants’ behavioral characteristics rather than demographics. To be more specific, we use a combination of qualitative and quantitative data to explore user types, interpret personal behaviors, and identify user needs to be addressed in current online shopping groups and platforms.

2.3. Users’ Roles in Online Communities

Prior research developed personas in online communities based on users’ posting and participation behavior. For example, in terms of the roles in information flows, Fisher and Durrance [37] classified online community users into two major categories: information providers and information consumers. With regard to the participation and experience levels, Kim [38] divided the users based on their evolving participation in online communities, from visitors to novices, regulars, leaders, and elders. Another typical way to define personas in online communities has stemmed from users’ social interaction and contributing behavior to the platform, such as Turner et al. [39], who described online community users as answer person, questioner, troll, spammer, binary poster, and conversationalist.

Most prior studies have focused on the impact of user participation and contribution on consumer purchase decisions in existing social shopping works [12]. However, there is a lack of exploration of the factors that drive users to participate and share in online platforms and communities [11]. Therefore, traditional methodology of developing personas merely according to their posting and participation behavioral patterns might fall short of a comprehensive understanding of why users join and contribute to online shopping communities. In this study, we also focus on users’ personal motivations and objectives in their participation, as well as how users develop their goal as they interact with others and the community in general. Therefore, this study aims to answer the questions:

RQ1: Who are participating in online shopping communities?

RQ2: What are the social characteristics of members in online shopping communities?

3. Methodology

As mentioned in the previous section, our work emphasized on online shopping community participants’ behavioral characteristics rather than demographics and fictitious details. While we understand that these extra fictitious details are useful constructs for talking about personas, especially

in making them a more realistic “person” in combination with usage scenarios, we intentionally avoided these fictitious details as not to shift the focus from the core details of the personas. Similar methodology to identify personas in online communities is used in other HCI works [29], which also focused on the grouping of personas rather than the fictitious persona details.

The methodology of creating our personas consisted of a three-step process involving (1) semi-structured interviews, (2) focus groups, and (3) an online survey. Data and findings from each step informed the design of the next step. The first two steps, interviews ($n = 20$) and focus groups ($n = 24$), aimed to identify the complex and diverse characteristics of social shoppers and members in online shopping communities. Based on this data, we generated initial groupings of personas using open coding and affinity diagramming. For the third step, we constructed survey questions and used Amazon’s crowd-sourcing platform, Mechanical Turk (Mturk) to collect responses ($n = 194$) to cluster social traits, extract behavioral characteristics, and identify personas in online shopping communities. All procedures in this study were approved by the authors’ Institutional Review Board.

The overall recruitment criterion was set to recruit only “active members” in online shopping communities. For the interviews, we mainly focused on user participation on shopping topics through social media to gain initial insights, and wanted to talk to people who have actually actively participated (e.g., posting, sharing). Similar criterion was also used to recruit participants for focus groups. However, we expanded the criterion of “sharing/posting shopping through social media” to “online shopping platforms (e.g., product review sites, deal-sharing communities, shopping discussion forums)” to ensure the inclusion of active members on various online shopping platforms and contexts. For the survey, we used two qualifying questions to ensure the participants have at least posted/shared once in the past three months on online shopping platforms or shopping groups on social media.

3.1. Semi-Structured Interviews

We conducted our semi-structured interviews with 20 people who self-reported to be active social shoppers. To ensure we recruited only active social shoppers, we pre-screened the participants and chose to only interview those who reported to “have shared and discussed about shopping topics on social media in the past month.” We used an open coding scheme to derive themes and theoretical constructs.

We recruited the participants mainly by using campus flyers at a university in the northeastern USA, with the exception of two participants, who learned about the study by word-of-mouth from their friends. All participants were paid \$5 in either cash or Amazon e-gift card for in-person interviews or online interviews, respectively. We conducted 17 of the 20 interviews in-person at a location of the participant’s choosing, namely universities, coffee shops, and libraries. The other 3 interviews were conducted online using WebEx audio chat due to logistic and scheduling issues. Of the participants, 13 were male, 7 were female, and ages ranged from 18 to 36 (median 24) years old. Breakdown of ethnicities was as follows: 5 White, 4 Black, 2 Hispanic, 5 Asian, 4 Middle Eastern.

All interviews were audio recorded and transcribed for further data analysis. The interviews ranged from 21 to 39 (median 33) minutes in length. Summaries of each interview were written before the end of the day when the interview was conducted. A Grounded Theory approach was used for the qualitative analysis of interview data. We went through an iterative independent coding process to allow themes in the data to emerge naturally, and we then generalized theories from these themes. We used open coding with two independent coders coding the transcripts for emerging themes around the research questions.

The interview guide went through some minor updates through the course of the interview study, making minor adjustments to the questions to focus on emerging themes from previous interviews. Some of the literal questions that asked about motivations and behaviors were: “Why did you share about items on social media?”, “How do your family and friends react to your postings”, and “What types of items do you usually share on social media and why?”. Other questions that asked more generally about their activities also contained discussion on those topics. There were also questions

that asked participants to recall enjoyable and awkward situations when they have shared about shopping topics on social media. The initial interview guide aimed to grasp a broad understanding of participants' social shopping experience. Next, we updated some questions to focus on people's interactions with others on both social networks with regard to shopping and the use of review sections/discussion forums on various online marketplaces. Finally, we made minor adjustments to include the examination of people's challenges during their collaborative social shopping processes on existing online systems (both social media and online marketplaces), and the expectation of how their social shopping needs can be better addressed. The interview process lasted several weeks until repetitive patterns (i.e., data saturation) emerged in participants' answers to the questions.

3.2. Focus Groups

Next, we conducted a series of 6 focus groups with 4 participants in each study session. The objective of the focus groups was to further explore users' social characteristics, behavioral patterns, and motivations in their participation in online shopping communities, by facilitating conversations among experienced members [9].

Recruitment was focused on people who actively engaged in social shopping activities and online shopping communities with other users on online platforms. Similar to our interview study, the participants were recruited by campus flyers at a university in the northeastern USA and pre-screened by using an online sign-up form that asked about shopping interests, online shopping history, and social shopping experience. To ensure we talked to active social shoppers participating in online shopping communities, we only accepted those who self-reported to have posted contents on online shopping platforms (e.g., product review sites, deal-sharing communities, shopping discussion forums) and/or engaged in shopping groups on social media in the past three months.

A total of 33 United States college students filled out the sign-up form, of which 24 participated in the study. Fourteen (58.3%) participants were female, and gender was balanced as much as possible across all study sessions. Four out of six focus groups had 2 male and 2 female participants, while the remaining two consisted of 3 female and 1 male participants. Our participants' ages ranged from 18 to 31 (median 22) years old. The breakdown of ethnicities was as follows: 7 White, 9 Asian, 4 Black, 3 Hispanic, and 1 Native American.

All focus groups were audio recorded and transcribed for data analysis. The focus groups ranged from 38 to 47 minutes in length. The protocol started with questions about the participants' social shopping experience, including reading, posting, motivations, expectations, and challenges on online platforms. Some of the literal questions that asked about their experience were: "Why do you participate in the [online shopping group/community]?" and "How do you evaluate your relationship with other [group/community] members?", where specific groups or communities depend on the response from previous questions. However, other questions that asked more generally about their regular activities, as well as how and why they read and post information in online shopping communities.

To analyze the focus group data, we went through iterative independent coding process and then generalized theories from the themes. We used open-coding and arranged the codes in groups and hierarchies to determine emergent themes. High-level codes included "experience," "motivations", "evaluation", as well as emotional codes such as "support," "relationship," "connectedness".

3.3. Online Survey

The qualitative studies provided us with preliminary results on personas that characterize people's motivations, preferences, and behavioral patterns when participating in online shopping communities. We used these preliminary findings to construct survey questions to reach a larger number of participants and examine how much they agree with the social characteristics we generated from the initial qualitative findings.

We developed an online survey by using Google Form, and used MTurk to recruit online participants. The survey was first piloted on 20 subjects, and we made minor changes in the wording

to improve clarity. The survey questionnaire was made up of 3 major parts. The first part consisted of two qualifying questions to ensure the participants “have posted on online shopping platforms (e.g., product review sites, online shopping forums) in the past three months” and/or “have engaged in shopping groups (e.g., electronics, fashion, sneakers) on social media platforms (e.g., Facebook, WhatsApp) in the past three months”. Any participants who answered “no” to both questions were not allowed to proceed with the remaining survey questions. The second part asked about demographic information, including gender, age, ethnicity, and educational background. The third part asked about a person’s online shopping experience and behavior based on various perspectives: (1) objectives of participating in social shopping and online shopping communities; (2) information sharing/posting behavior; and (3) information consumption/reading behavior. An open-ended question was added at the end of each category in this part to elicit additional responses and thoughts on their participation in online shopping communities.

We set the initial payment at \$0.60 per assignment based on the payments of other similar MTurk assignments. This is to keep in line with the current federal minimum wage (\$0.12/minute, or \$7.25/hour) and also higher than the amount a recent survey of online MTurk workers indicated as fair compensation (\$0.10/minute) [40]. The survey results were used for cluster analysis based upon the Euclidean distance in Python, and then compared against the initial qualitative findings on the grouping of personas. In the next section, we describe how we developed the survey questions based on initial qualitative findings from the interviews and focus groups around user behaviors and motivations in online shopping communities. We then present the personas that emerged from the initial qualitative findings, as well as the cluster analysis of the online survey results.

4. Findings

4.1. Survey Question Constructs Inspired by the Qualitative Studies

Based on the analysis of our interview and focus group data (as shown in Figure 1), we identified three main themes that are generally related to distinctive user preferences and behavioral patterns in their participation of online social shopping platforms and communities: reading behavior, posting behavior, and motivation of participation.



Figure 1. A screenshot of the affinity diagramming exercise in the generalization of user behavior.

The reading (information consumption) category involved participants’ information-seeking methods, the frequency of reading and visits, and their attitudes towards existing information on online platforms and discussions within the groups or communities. Some participants expressed higher trust about the overall ratings and reviews provided by online platforms, while others preferred to read more personalized posts from fellow members on products and services that interested them.

Most participants typically read posts around specific products or categories of items, whereas some follow specific users from certain platforms and groups to be informed of the latest trends or deals. Many participants indicated that they usually read posts that are highlighted by platforms, but a few participants also told us that they would like to explore all available forum posts or group discussions before making any purchasing decisions, if possible.

The posting (information sharing) category asked the participants the frequency of posting, how they ask and answer questions, elicit others' opinions and suggestions, and whether they tend to initiate discussion within online shopping groups or communities. From the interview and focus group studies, we learned that some people posted for both asking for others' opinions and sharing their own thoughts on others' threads, while others typically only post when they are in need of help on making purchasing decisions on certain products.

The motivation category involved reasons why the participants joined and visited online shopping platforms and communities on a regular basis. The findings from the interview and focus group studies suggested that most participants cited information-seeking as the most prominent factor, while some also valued the social communication and support from other members who share similar shopping interests and experience, and a few participants appreciated the feeling of building up a community together.

4.2. Preliminary Findings on Personas

From the diagram analysis of our qualitative data, we found that people exhibited various behavioral characteristics in terms of information consumption (reading), information sharing (posting), and personalized motivations in their participation in online social shopping platforms and communities. These findings indicate that some common user behavioral patterns include looking for specific information, soliciting opinions and suggestions on products, experiencing reciprocated support between community members, and staying informed about the latest trend(s). Therefore, based on these findings and observations, we identified the existence of four major prototypical types of active participants (i.e., personas) in online shopping communities. The four personas and representative characteristics are presented as below:

Opportunists: Seek targeted shopping information online only and leave when they get it.

Contributors: Constantly share information online, write reviews, and answer questions for other users on various platforms and in online shopping communities.

Explorers: Browse a large amount of shopping and product information (e.g., deals, reviews, product specs not provided by manufacturers) and regularly ask for suggestions and opinions products and retailers from others.

Followers: Participate in online groups and communities to keep up with the updated information about certain categories of products (e.g., fashion, sneakers, watches).

These four personas illustrate various behavioral social characteristics that online shopping community members possess and exhibit in their day-to-day participation. However, since personas are typically transitional and one person may be represented by multiple personas, we then used a larger scale survey to reach more online shopping community participants and examine how these personas cluster around users' personalized motivations and behaviors in online shopping communities. Therefore, we translated the findings from the two qualitative studies into a survey questionnaire, and then disseminated the survey to 200 active members of the online shopping community on MTurk. As discussed in previous sections, the survey asked about demographics, reading and posting behavior, and motivations of participation in online shopping communities.

4.3. Overall Survey Results

In Table 1, we present the demographics of the survey respondents from MTurk. We found the majority of our participants were in their 20s and 30s. The participants were evenly distributed between male and female, and most of them (90%) had more than six months experience in participating in online shopping groups and/or communities.

Table 1. Demographics of MTurk survey respondents (N = 194).

	Characteristics	Percentage
Gender	Male	48.1%
	Female	51.9%
Age	18–24	16.2%
	25–34	44.1%
	35–44	23.5%
	45 or older	16.2%
Ethnicity	Hispanic	14.7%
	Non-Hispanic	85.3%
	White	62.7%
	Black	21.2%
	Asian	16.7%
Experience in Online Shopping Groups and/or Communities	More than 2 years	31.8%
	1 to 2 years	43.9%
	6 months to 1 year	14.4%
	3 to 6 months	8.3%
	1 to 3 months	1.6%
	None or less than 1 month	0.0%

The survey results showed that the majority of respondents were active participants in online shopping platforms and communities (as expected from our qualifying questions), with 74.4% reading online threads for shopping purposes at least a few times a week, 71.5% posting online threads on shopping topics at least a few times a month, and 71.8% participating in online groups and communities a few times a month, or more frequently. Tables 2–4 present a detailed percentage breakdown of the participants’ answers to each of the questions in the three main categories: reading behavior, posting behavior, and motivations of participation.

Table 2. Frequencies (%) of label items constructing the category of Reading Behavior (N = 194).

	1	2	3	4	5	6	7
I read as much information as possible.	2.0%	0.0%	11.2%	12.2%	14.3%	41.8%	18.4%
I trust what other people post.	3.1%	8.2%	7.1%	15.3%	44.9%	15.3%	6.1%
I need lots of supporting details for me to believe.	1.0%	4.1%	9.2%	15.3%	32.7%	24.5%	13.3%
I look for personalized experience with products.	3.1%	5.1%	9.2%	22.4%	20.4%	26.5%	13.3%
I look for general product information.	3.1%	2.0%	9.2%	9.2%	24.5%	34.7%	17.3%
I know what information I am looking for.	4.1%	2.0%	9.2%	15.3%	16.3%	34.7%	20.4%
I selectively choose what information to read.	2.0%	2.0%	9.2%	15.3%	23.5%	33.7%	14.3%
I visit online shopping groups on a regular basis.	4.1%	5.1%	8.2%	17.3%	28.6%	24.5%	12.2%

1: Strongly Disagree; 2: Disagree; 3: Slightly Disagree; 4: Neither Agree nor Disagree; 5: Slightly Agree; 6: Agree; 7: Strongly Agree.

These results show the overall responses from the participants on MTurk, and illustrate how and why people read, post, and are motivated to participate in online social shopping communities. Next, we describe each persona in more detail by using a combination of the findings from the qualitative studies and a cluster analysis of the survey results.

Table 3. Frequencies (%) of label items constructing the category of Posting Behavior (N = 194).

	1	2	3	4	5	6	7
I ask questions.	1.0%	7.1%	5.1%	13.3%	23.5%	33.7%	16.3%
I initiate discussions.	4.1%	14.3%	13.3%	11.2%	26.5%	17.3%	13.3%
I answer others' questions.	3.1%	9.2%	10.2%	8.2%	30.6%	30.6%	8.2%
I share my personal experience.	3.1%	6.1%	7.1%	13.3%	26.5%	31.6%	12.2%
I share my opinions on products	3.1%	3.1%	7.1%	13.3%	24.5%	36.7%	12.2%
I share good deals with others.	6.1%	9.2%	10.2%	12.2%	23.5%	26.5%	12.2%
I share emotional support with other members.	13.3%	12.2%	9.2%	20.4%	20.4%	17.3%	7.1%
I warn about spams and advertisements.	9.2%	13.3%	6.1%	17.3%	17.3%	27.6%	9.2%
I engage in conversations on non-shopping topics.	11.2%	16.3%	12.2%	14.3%	15.3%	20.4%	10.2%
I solicit others' opinions on certain products	10.2%	10.2%	7.1%	21.4%	16.3%	25.5%	9.2%

1: Strongly Disagree; 2: Disagree; 3: Slightly Disagree; 4: Neither Agree nor Disagree; 5: Slightly Agree; 6: Agree; 7: Strongly Agree.

Table 4. Frequencies (%) of label items constructing the category of Motivation (N = 194).

	1	2	3	4	5	6	7
To exchange shopping information	0.0%	4.1%	5.1%	15.3%	28.6%	30.6%	11.2%
To exchange opinions on products and experience	4.1%	5.1%	8.2%	17.3%	16.3%	35.7%	13.3%
To have conversational interactions with others	7.1%	10.2%	14.3%	15.3%	22.4%	21.4%	9.2%
To keep up with the most updated trend	9.2%	8.2%	11.2%	13.3%	19.4%	27.6%	11.2%
To be part of a community that interests	9.2%	6.1%	10.2%	15.3%	20.4%	25.5%	13.3%
To exchange emotional support with other members	15.3%	11.2%	6.1%	17.3%	17.3%	22.4%	10.2%

1: Strongly Disagree; 2: Disagree; 3: Slightly Disagree; 4: Neither Agree nor Disagree; 5: Slightly Agree; 6: Agree; 7: Strongly Agree.

4.4. Social Characteristics of Personas

From the qualitative studies, we identified four main types of users in online social shopping communities with corresponding characteristics in their reading behavior, posting behavior, and motivations of participation. The cluster analysis (as shown in Table 5) of the survey data showed some overlaps in the characteristics of the personas of opportunists, explorers, and followers, whereas the dominant behavioral patterns of contributors were featured as knowledge/information sharing, emotional exchange, and community building. Similar to prior persona studies in other online communities [29], we found that individuals in online shopping communities possess one dominant persona, but may sometimes illustrate characteristics from multiple personas. Individuals with one dominant persona may transition to another persona as the level of their participation and experience in their online shopping communities evolves and their goals and needs change. As a result, the findings from both our qualitative and survey data suggest that the personas are not mutually exclusive, and one may possess a mixture of behavioral characteristics across different personas. Next, we will discuss each persona with their main corresponding behavioral patterns and motivations of participation in online shopping communities. For the representative quotes, we have changed the names of our participants to preserve their privacy and anonymity.

Table 5. Cluster analysis of the survey results indicating related characteristics of each persona.

		Opportunists	Contributors	Explorers	Followers
Reading	Targeted Search	X			
	Read All		X	X	X
	Trust People				X
	Look for Personal	X		X	
	Need Supporting	X		X	
	Selectively Choose	X			
Posting	Ask Question			X	X
	Initiate Discussion		X		
	Answer Questions		X		
	Share Experience		X		
	Emotional Support		X		
	Solicit Opinions	X	X	X	
	Engage Others		X		
Motivation	Shopping Info	X		X	
	Exchange Experience		X	X	
	Conversations		X		
	Keep up with Trend				X
	Emotional Exchange		X		

4.4.1. Opportunists

Opportunists are usually occasional visitors to online shopping platforms and/or groups with specific objectives. Those who just joined an online shopping forum or group are usually opportunists, performing targeted searches about specific products that they consider purchasing, comparing other users' posts of personal experience with the products, and rarely post on the platform or within the social shopping platforms and communities. Opportunists prefer to stay silent as a reader and leave when they feel they have got enough information to make any well-informed shopping decisions. For example, as Jerome told us during a focus group, "I always have something in my mind when I read the posts (on an online sneaker forum) . . . I found the forum about a year ago by search on Google, and then I have the forum bookmarked and visit whenever I wanna know about some sneakers."

With regard to reading behavior, opportunists do not typically read posts or threads in depth. When searching for information about products, they tend to gather information from multiple platforms, including product websites, online reviews, forums, and social shopping groups. However, due to the large volume of information to process, opportunists typically skim through all available information and quickly jump from one site to another. For instance, Catherine shared her experience in online shopping forums and a Facebook fashion group, "I got lots and lots of information everyday, but I don't necessarily pay attention to all of these. . . Most of the time I just skim and if there's anything that look interesting to me, I check it out on different sites." David also echoed this sentiment, saying "I don't read all the posts, as I wanna be efficient in collecting all the useful information. . . It's not like a reading assignment, you know, you get to know what is useful and what is not. You have the sense when you've been there for a while."

When asked about why they joined and participated in online shopping groups and communities, many opportunists preferred the personal/directed, conversational discussions about products, rather than the general information (i.e., specifications) and reviews on websites, such as those on Amazon and Best Buy's websites. For example, Daniel explains, "I enjoyed reading people's conversations on the forum, and I like the personal experience part shared by those people. On Amazon, you also see the ratings and reviews, but they are more general, not too related to someone like me." Daniel continues his discussion, comparing the reviews on Amazon and users' posts on an online camera forum, "When you wanna buy an advanced lens, you trust actual people more than the ads, and you know, the reviews are not that reliable on Amazon." Jeremy also shared similar thoughts on more personalized feedback on products during the focus group, "In my [Facebook] group, people share about deals

and others comment on if it's a good deal or not. . . I feel like someone is so kind that he knows about everything and is always willing to help."

4.4.2. Contributors

Distinctively different from opportunists, contributors regularly post information and support other members in online shopping communities. They view online shopping forums or groups as a social space for both informational and emotional exchange. Contributors are typically regular visitors of those online shopping communities, participating in discussions, posting to share information and answer questions, and building up a community to engage people who share similar shopping interests.

For many contributors, they usually have their "main" group or community that they often contribute to. In most circumstances, they also played a role in administrating or moderating in their communities. Contributors do not visit the online shopping communities for specific shopping purposes. Instead, they consider it more as part of their daily routine to read the new posts from their last visit. In terms of reading behavior, they try their best to at least skim through all unread posts as much as possible, and carefully evaluate the information quality of a post. As Samantha told us during her interview, "Everyday when I wake up, I go through all the posts that I left from last night (in a Facebook cosmetic group), to see what other people are talking about (cosmetics). Things go super-fast and you need to catch up with it, otherwise you feel left behind. . . People reply to my posts very quickly, but they are not always helpful. You have to filter the information by yourself."

With regards to the posting behavior, contributors are willing to share information, deals, personal experience with fellow members and to help others by answering questions within the communities as much as they can. Contributors are usually experienced users of the online shopping platforms or groups, so they feel they have the responsibility to help others as they also have personally benefited from the community in the past. As explained by David, a veteran user of an online electronics forum, "When I first joined the forum, I asked a lot of questions and I really appreciated the help from other users. Even if we don't know each other in person, we become friends on the forum and talk about laptops and cell phones all the time. . . Now when I see other people's posts, and I think I can help on this, I will definitely do so and I like the feeling of having a big family that supports each other."

For contributors, the motivations for participating in online shopping communities are typically beyond practical reasons. The primary goal of their participation is usually to build up a community for people to socially interact, and they believe regular posting and conversations are an effective way to keep up with and connect with the members in the community. As said by Linda about her Facebook fashion group, "The key of running a Facebook group is to make a community that connects people and make people active. The first thing you need to do is to share what you know and help each other... The sense of community is the most important thing that people value, and I have always wanted to have in our group."

4.4.3. Explorers

Explorers participate in online shopping communities primarily for informational purposes. However, unlike opportunists who have very targeted goals of information search, explorers typically do not necessarily know what they are looking for when visiting or engaging in discussion within their shopping forums or groups. Instead, they tend to generally explore what other people are talking about and expect to be surprised by creative products or unusual shopping tips. For example, Diana described her experience during her focus group, "I don't have anything specific in mind. I just go there [an online deal-sharing forum] and see what other people are talking about. You never know what you don't know... Once I found a guy talking about automatically generating the 20% coupon code of Bed Bath Beyond by himself. I tried it and it actually worked."

Explorers do not only read posts, but also post questions and opinions in online shopping communities. However, rather than asking about specific products, explorers usually post things to initiate discussions in a more general way or challenge other members by providing "unusual"

experience on certain products. For example, Zach explained what he typically posts on an online sneaker forum, "I don't ask about the shoes that I want to buy, because nobody can tell you how they feel on your feet, you know. The thing that I post is usually about the trend or why people would prefer one thing over another. . . Sometimes my opinions are different from others on some very popular shoes and I believe it helps to listen to different voices."

In general, explorers are curious and open to new shopping ideas or creative products. They are always ready to be surprised when participating in online shopping communities. Most of the explorers enjoyed their visits to the posts on shopping forums and discussions within shopping groups. As Jack, an experienced member of an online camera forum for more than three years explained, "I view it [participating in online shopping communities] more as a way to relax and discover new things, rather than gathering information and do product research for buying stuff."

4.4.4. Follower

Followers typically stay quiet in their shopping groups/forums and use it to keep up with trends. Similar to opportunists, followers occasionally visit online shopping communities. However, unlike opportunists and more similar to explorers, followers usually do not have "any assumptions when [going on] forum, and [. . .] let people[s posts drive] what is interesting" (Jenna). Most followers are passive information readers and rarely challenge information in other people's posts or comments. As Luiz told us during his interview, "I just got into the thing [collectible cards], and I think of the forum as more of a place to know and learn about it . . . no, I never challenge them [other users]. I know I'm a newbie here."

With regard to posting behavior, followers might post questions occasionally, but it is very uncommon for them to share any new information or personal experience within their online shopping communities. Instead, their posts typically are follow-up questions based on other members' posts. For example, Ellen has shared her experience in a Facebook fashion group during the focus group, "People in my group have a good sense of fashion. I've been following them for a long time. Usually when they say something (handbag or fashion shoes) is gonna be popular, everyone around me will be talking about it after a few weeks. . . I do post sometimes, but I just follow what they've been talking about."

4.4.5. Summary

Table 6 shows the four personas with representative characteristics regarding their motivations for participation, reading behavior, and posting behavior in online shopping platforms and groups. As discussed in earlier sections, we consider the personas as dynamic and mutually inclusive prototypes of participants in online shopping communities. The findings from the two qualitative studies and surveys suggest users may sometime possess characteristics across multiple personas. An individual user may also develop characteristics and transition from one persona to another over time as their participation patterns evolve and roles within the online shopping communities change. For example, it is very common for new users to join communities as "followers" or "opportunists". However, as they continue to be a member of the community for an extended period of time, especially if they develop "a sense of community" or "have a feeling to repay what they've got from others" (David), they may transition to being "contributors" and voluntarily assume the responsibility of building up a community.

Table 6. Summary of each persona with the representative characteristics of their motivation of participation, reading behavior, and posting behavior in online shopping communities.

	Motivation of Participation	Reading Behavior	Posting Behavior
<i>Opportunists</i>	To collect the information they need to make purchasing decisions	Perform targeted search on the products they are interested in	Very rarely post things in online shopping communities
<i>Contributors</i>	To build up a community for people who share similar shopping interests	Read as many posts as possible and carefully evaluate the quality of the posts	Regularly post to share information, answer questions, and support others
<i>Explorers</i>	To look for new ideas, opinions or products from others	Skim through online posts and threads for unusual things that surprise them	Post questions and information to initiate discussion or solicit others' opinions
<i>Followers</i>	To keep up with the latest trend	Browse information and discussion threads among other people	Rarely post and primarily post only follow-up questions upon existing discussion threads

5. Discussion

5.1. Understanding and Supporting Various Needs of the Personas in Online Shopping Communities

This study identified four major types of participants in online shopping communities, based on their motivations, reading, and posting behaviors. Similar to other online communities [29], only a small portion of the participants post and contribute to their respective communities regularly, while most participants visit online shopping communities for informational purposes. There is an imbalance in the supply and demand of high-quality posts, especially personalized shopping experience or advice.

Traditionally, companies and online retailers play a significant role in providing product information [1] and moderate customer discussion [11] in online shopping communities. However, this study found that more individualized informational demands have emerged among participants and have not yet been well addressed by existing systems. For example, participants who had the Explorer personas are particularly looking for “unusual” posts or novel ideas that surprise them. Even for participants of Opportunist personas, some of them also highly prefer discussions on products or services based upon personal experience from fellow members in their respective communities over “mainstream” reviews that are typically available on established platforms like Amazon or Google.

To increase the supply of such personal experience, reviews, and recommendations from individual users in online shopping communities rather than marketers, one of many possible ways would be to identify those participants who had Contributor personas, encourage the knowledge-sharing behaviors of the Contributors to the community, and facilitate the transition of participants from other persona types into Contributors.

To encourage the contribution behavior in online communities, previous literature suggested the challenges around commitment and members' willingness to share can be addressed by: identity-based commitment (where users' contributions to the communities come from the feeling of the responsibilities to fulfill a mission together), and bonds-based commitment (where users participate and contribute as a result of friendship or feeling close to other individuals within the groups) [41]. In the context of online shopping communities, there might be a smaller chance of users developing a strong empowering identity involved in being part of a group like some online cancer-supporting communities. Instead, bonds-based commitment may work better among users who share similar shopping interests or experience, which includes both the informational and emotional exchange on shopping topics, as well as the sense of membership within the communities. Though Contributors only account for a small number of participants in online shopping communities, as we found from the study, they play a critical role in posting information, answering questions, and providing emotional

support to others, and thus help building up a community that engages various types of users to visit, discuss, and share on a regular basis.

In addition, we discovered that the personas identified in this study are dynamic and transitional. As a result, users may also develop the contribution behaviors as they participate within online shopping communities. For example, prior studies suggested “conversational interaction” may facilitate users’ interpersonal social connections within online communities [9], which increase the personal attachment among the community members. As users feel more socially connected with other members and the community in general, Opportunists, Explorers, and Followers are more likely to engage and contribute to their respective communities. To facilitate a socially connected environment and the development of social ties within the communities, we need to understand the various persona types with regard to their reading behavior, posting behavior, and motivations so as to support the individualized social needs of the participants. When users engage in online shopping groups/communities, the possibilities of socialization and relationship formation may depend on the matching of users with complementary users. For example, Explorers are more likely to develop social connections through interactions with Contributors, as these two groups of users present complementary behavioral characteristics. However, it is unrealistic to expect Explorers and Opportunists to communicate and develop such relationships. Practitioners and designers may use the findings from this study to better support user engagement and interaction, address users’ informational and emotional needs, and facilitate knowledge-sharing behaviors within online shopping communities.

5.2. Technological Implications

As presented in the previous sections, we identified the various types of personas and the quality information imbalance in supply and demand in online shopping communities. We also examined the motivations of user participation and interaction within the communities. Based on the findings, we propose the following recommendations to support user needs and inform future design of online shopping platforms and groups. These implications aim to identify user types, facilitate user interaction to form bonds-based commitment, and encourage contribution behaviors among community members.

First, online systems may profile users and cluster their activity history (i.e., readings and postings) to adjust the layout of the site contents and personalize the user experience in their visits to online shopping platforms/groups. For example, participants of the Opportunist or Explorer persona type may have a higher demand for posts of product reviews, shopping tips, and item recommendations. However, Contributors may desire to have a different layout of the content page that summarize the latest questions raised by fellow members. At any point in time, user profiles and activity history offer rich details for the systems to examine the dominant persona type, so as to provide personalized content for users to explore in online shopping communities.

Second, as users’ knowledge-sharing behavior and contribution to the community are largely associated with their perception of connectedness with other members and their respective community, the challenges of facilitating user interaction that leads to bonds-based commitment within online shopping communities need to be addressed. One of the possible solutions to the challenge would be “conversations” among online shopping community members, on or beyond shopping topics. As indicated by previous studies [9], conversational interactions support both informational and emotional exchange in online communities, and thus lead to a positive impact on establishing social ties among community members. For example, conversational discussions on a camera forum may lead to the discovery of common hobbies like photography and traveling. As we learned from the qualitative studies, such conversations may also provide emotional exchange and support to facilitate the feeling of being part of a community among members, which is essential to the transition from participants of the Opportunist persona to Contributors.

Third, to address the information imbalance in supply and demand from individual users, designers need to encourage individualized contributions from the community members, especially the

Contributors. Currently, point or badge systems are most widely used to encourage user participation and posting behaviors in most online communities. However, as we learned from this study, “human response” is also highly appreciated as stimuli of knowledge-sharing behavior. In other words, rather than getting points or level upgrades, participants would like to have more interactions with other people when they have posted on online platforms or groups. Therefore, future research may work on the distribution of users’ posts based on various types of user personas, to ensure any individual users have the appropriate relevant information to read and reply. The increase in the chance of interpersonal interactions on those user-generated posts can result in sustainable contribution behaviors within online communities in the long run.

6. Limitations

Despite the findings from the combination of the qualitative and quantitative studies, we are also aware of the limitations that may warrant further examination of the study results. First, our personas and findings are based on a relatively small number of participants that skewed toward young adults in the US. Personas, by nature, are highly qualitative constructs that can be difficult to quantify [29]. As a result, the personas generated from the study are not mutually exclusive and possess some overlapping characteristics across various persona types. Second, we extract motivation, reading, and posting behaviors as the major characteristics from the qualitative studies to construct and cluster personas based on the survey respondents. However, due to the limitation of the sample size, there might be additional behavioral patterns that are not fully identified from the qualitative studies and therefore not included in the survey questionnaire. Third, this study may also include self-selection and self-report bias. Although we pre-screened participants and targeted only active online social shopping community members, the recruitment unavoidably depends on the accuracy and honesty of the self-reported data in the sign-up form of the qualitative studies or the qualifying questions of our online survey.

7. Conclusions

Social shopping and the emergence of online shopping communities allow users with similar shopping interests to communicate and interact. This study identified four types of personas that help illustrate the complex nature of user participation and behaviors in online shopping communities. Our work contributes to a comprehensive understanding of the dynamics of personalized motivation and behavioral patterns of various personas in online shopping platforms and groups. Moreover, we also identified the challenge of information balance in supply and demand from individualized contribution to the communities. Our findings suggest that a socially connected and interactive community benefits both the informational and emotional exchange within the communities. Based on the findings, we discussed a series of design implications to identify user types, facilitate user interaction to form bonds-based commitment, and encourage contribution behaviors among community members.

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