Abstract

Online referrals have become an important mechanism in leveraging consumers’ social networks to spread firms’ promotional campaigns and thus attract new customers. However, despite a robust understanding of the benefits and drivers of consumer referrals, only minimal attention has been paid towards the potential of classical promotional tactics in influencing referral behavior. Therefore, this study examines scarcity and social proof, two promotional cues which are linked to extant referral literature and are of great practical relevance, in the context of a randomized online experiment with the German startup Blinkist. Our analysis reveals that scarcity cues affect consumers’ referral propensity regardless of the presence of social proof cues, but that social proof cues amplify scarcity’s effect on consumer referral propensity. We demonstrate that consumers’ perceptions of offer value drive the impact of scarcity on referral likelihood and illuminate how social proof moderates this mediating effect.

Keywords: E-business, Electronic Word of Mouth, Consumer behavior, Online Promotional Campaigns, Scarcity, Social Proof, Perceived Offer Value
Introduction

Recently, as e-commerce penetrates people's everyday life, firms are increasingly relying on online referrals when generating awareness and acquiring new customers for their offerings. Against the backdrop that consumers are being deluged with traditional advertising, which is causing its effectiveness to fade (Porter and Golan 2006), interpersonal communication between consumers (i.e., referrals) has become a popular channel to spread marketing messages and attract potential customers (Todri and Adamopoulos 2014). The objective is to leverage consumer's social networks in order to promote and amplify the firms' marketing messages by encouraging users to pass along information to their peers (i.e. make referrals). Online referrals are peculiar in the broader context of electronic word of mouth (ewom), which also encompasses the articulation of opinions and reviews on online platforms like, for example, virtual online communities (Hennig-Thurau et al. 2004). Several studies have demonstrated that consumers' choices may be significantly influenced by each other and that word of mouth is perhaps the most important and credible source of information in consumer decision making (Brown and Reingen 1987; Chakravarty et al. 2010). The practice that focuses on generating campaign referrals not only through first stage (i.e. consumers that have received a message directly from the provider) but also second stage actors (i.e. consumers that have received a message from another consumer that has referred it to them) is also called viral marketing (Pescher et al. 2014). Firms that manage to design viral promotional campaigns benefit from cost efficiencies, broad reach and high credibility by capitalizing on the notion that consumers attribute higher credibility to information received from other consumers than from traditional advertising (Godes and Mayzlin 2004). Hence, it is not surprising that especially IT startups which usually neither possess significant brand equity nor drown in credibility rely on online referrals when spurring awareness around their offerings. Companies such as Groupon, Instagram, Spotify or also Pinterest, which has managed to grow its monthly unique visitors from 40,000 to 3.2 million users in only one year, are more recent examples that have managed to harness the power of online referrals to their advantage (Dörr et al. 2013; Techcrunch 2011).

Extant IS and marketing literature highlight the impact of ewom and viral marketing on firm level outcomes such as sales (e.g., Chen et al. 2004; Clemons et al. 2006; Gu et al. 2012; Trusov et al. 2009) as well as individual level outcomes related to consumer decision-making (e.g., Bickart and Schindler 2001; Chevalier and Mayzlin 2006; Dierkes et al. 2011; Gauri et al. 2008). Furthermore, scholars have paid great attention towards the design of referral-incentive systems (Biyalogorsky et al. 2001; Ryu and Feick 2007; Shi et al. 2012), as well as content characteristics (e.g., Berger and Iyengar 2012; Berger and Milkman 2012; Stephen and Berger 2009) and motives that lead consumers to engage in referrals (e.g., Angelis et al. 2012; De Matos and Rossi 2008; Hennig-Thurau et al. 2004). However, hitherto minimal attention has been paid towards classical promotional tactics that may amplify consumer referrals, albeit they have proven effective in influencing consumer behavior in the offline world and have become common practice there. For example, to amplify consumers' purchase motivation, the online retailer Amazon created a sense of scarcity by only offering its new kindle tablet in a limited edition before actually making it available to the wider public (Forbes 2013b). Despite the practical influence of such classical promotional cues and Berger (2013)'s suggestion that an enhanced understanding of communication mechanisms affecting extant referral drivers may simply be obtained by examining traditional promotional tactics from the offline world, little empirical work has followed up on the subject.

Our research intends to fill this gap by examining the effects of scarcity cues (i.e., the deliberate shortening of a good's availability and the communication thereof), which are often embedded in the websites of e-businesses as part of their promotional campaigns, on consumers' propensity to engage in referrals. Furthermore, we shed light on social proof cues (i.e., the deliberate communication of the popularity or high demand of a good) as moderator for this effect. We focus on scarcity, because research on this cues has demonstrated its influence on a factor which literature considers particularly critical to referral engagement, namely product or information value (Frenzen and Nakamoto 1993; Pihlström and Brush 2008; Sundaram et al. 1998). Social proof is examined as moderator because research has insinuated that perceptions of a good's popularity or prior demand have a significant influence on the scarcity-perceived product value relationship (Van Herpen et al. 2009; Worchel et al. 1975). From a practical perspective, both promotional tactics have become popular among well established firms like Amazon.com as well as nascent ventures such as Mailbox alike when generating awareness and attracting
new potential customers and they are frequently deployed together (Forbes 2013b; Nextshark 2013; Techcrunch 2012). Despite the broad use of such promotional tactics, however, it is surprising to find that practical recommendations on the effect of scarcity and social proof on referral behavior are still limited, leaving practitioners puzzled and without guidance. Taken together, the objective of this study is therefore to address these gaps guided by the following research questions:

(1) What impact do scarcity cues embedded in the promotional campaigns of e-businesses have on consumers' referral propensity?

(2) How do social proof cues affect the impact of scarcity cues on consumers' referral propensity?

This study contributes to IS and marketing literature on ewom in several important ways. First, we seek to shed light on the potential of promotional tactics in influencing consumer referral decisions and therefore expand our understanding of the antecedents of consumer referrals in online environments. More specifically, we analyze the effectiveness of scarcity cues embedded in the promotional campaigns of e-businesses in enhancing consumers' referral propensity. Our study takes place in the context of a randomized online experiment conducted with the company Blinkist, a German startup that is set to deliver summaries of nonfiction books' key insights in a made for mobile format to consumers in over 100 countries all over the world. We thus analyze consumers' actual referral behavior in a real world context, unlike many other studies which measure referral or sharing intent (e.g., Brown et al. 2005; Noone 2012), a more subjective construct. Second, we illuminate the causal mechanism behind scarcity's effects on consumer referral decisions and in doing so expand the investigation of psychological processes in the ewom literature. Finally, our study examines how social proof cues, which are popular and are often combined with scarcity in practice, affect the causal pathway through which scarcity operates when shaping consumer referral decision, thereby further explicating a moderator which is of profound practical as well as theoretical relevance.

This paper is organized as follows. In the next section, we review prior literature on viral marketing and online referrals. We then draw on scarcity literature to round up the theoretical foundation of our research model. The following section presents the hypotheses regarding the effect of scarcity cues on consumer referral decisions, including the mediating mechanism through perceived offer value, as well as the moderating effect of social proof. The subsequent section describes the research methodology used within our experimental study, followed by our data analysis and the results of hypothesis testing. Finally, we discuss our findings, implications and directions for further research. The last section concludes our paper.

**Theoretical Background**

**Viral Marketing and Drivers of Consumer Referral Behavior**

Viral marketing is the practice of deliberately exploiting consumers' social networks by encouraging them to make referrals to their peers (i.e., forward a provider's marketing messages) (Leskovec et al. 2007). In practice, companies are increasingly paying attention towards the design of viral campaigns mainly for two reasons: cost effectiveness and broad reach. On the one hand, the rise of social networks through platforms such as Facebook, Twitter or LinkedIn, which have not only made it possible to share information with people outside one's direct network but have also simplified the process of resharing information down to a click, has contributed largely to the success of viral marketing in rapidly reaching a broad audience (Stein and Ramaseshan 2014). On the other hand, cost-effectiveness resulting from the fact that consumers are more likely to pay attention and are stronger influenced by each other than via traditional advertising has made viral marketing all the more attractive (Godes and Mayzlin 2004; Leskovec et al. 2007; Wagner et al. 2013; Wagner et al. 2014). Furthermore, companies drawing on viral marketing do not only benefit from higher credibility that consumers attribute to messages from their peers compared to direct messages from the provider, but it has also been demonstrated that customers who are acquired through referrals tend to be more loyal and therefore more profitable (Trusov et al. 2009).

An often cited success story of viral marketing is the online file hosting service Dropbox, which managed to implement an effective referral system that lead to a surge in its customer base from 100,000 to 4 million in only 15 months. Dropbox simply encouraged referrals by offering up additional storage for
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customers that successfully brought on friends (Veer asamy 2014). The emergence of social media has played an important role in making it easier and faster to implement campaigns that can go viral (Stein and Ramaseshan 2014). Companies like Facebook, Twitter or LinkedIn provide platforms that make it very simple to share information with people that reach way beyond one’s immediate network. Against this backdrop, the popularity and practical relevance of viral marketing has grown exponentially among companies of all sizes. More recently, firms build minimal web-based landing pages around their promotional offerings and then spread links to these over social networks when implementing their viral marketing campaigns (Forbes 2013a; Ries 2011). For example, by drawing on this method, the nascent venture Mailbox managed to accumulate over one million new signups over a period of six weeks without even having released its product (Techcrunch 2013).

Research has paid great attention towards the consequences of viral marketing on firm-level outcomes such as sales or revenue (e.g., Chen et al. 2004; Trusov et al. 2009). Similarly, it has been demonstrated on the individual level how consumers’ decisions like for example usage continuance and loyalty (Dierkes et al. 2011; Gauri et al. 2008) or also purchase decisions (e.g., Bickart and Schindler 2001; Dellarocas 2003) may be positively influenced.

A comprehensive amount of research has also dealt with the drivers of consumer referral behavior on the individual level. Product involvement, self-enhancement, satisfaction as well as customer commitment have been repeatedly identified as important motivators for consumers to engage in referrals (Benlian 2015; Bowman and Narayandas 2001; De Matos and Rossi 2008; Maxham III and Netemeyer 2002; Moldovan et al. 2011). Albeit it should go without saying that consumers’ perceptions of information value would influence the likelihood of them making a referral to their peers, only recently has this relationship been empirically substantiated (Pihlström and Brush 2008). Other scholars have put forward that people are concerned whether their actions will impair or enhance their image in the eyes of others (Leary and Kowalski 1990) and that this will affect their referral decision (Zhang et al. 2014). Cheema and Kaikati (2010) demonstrated that consumers’ need for uniqueness, which is the desire to perceive oneself as unique but at the same time accepted as individual member of society, has a negative influence on consumers’ willingness to make referrals. Shi et al. (2012) suggest that successful referral incentive systems need to be designed with caution and take into account the dynamics of social norms that consumers may be in conflict with when making a referral, for example because the financial reward might not be evenly split between the sender and the receiver of the referral. Lastly, Henning-Thurau et al. (2004) claim that social benefits are an important motivator for consumers to participate in viral marketing, which is in line with the findings of others (e.g., Berger 2013; Nahapiet and Ghoshal 1998) who suggest that social capital—referred to as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit” (Nahapiet and Ghoshal 1998, p. 243)—may very well be the most important reason why consumers engage in referrals. The rationale underlying this notion is that information, a crucial form of social capital, is the key through which people gain access to others’ resources (Coleman 1988; Tsai and Ghoshal 1998). Hence, social capital exists and governs relations among people, making the maintenance and creation of it critical to anyone’s personal and professional advancement (Coleman 1988).

Despite these valuable contributions to literature, it is surprising to find that only little attention has been paid towards classical promotional tactics which may successfully enhance consumer referral propensity. Merely Berger (2013) acknowledges that an analysis of traditional promotional tactics from the offline world may reveal novel insights into further drivers of consumer referral behavior. However, to the best of our knowledge this call for research has remained largely unanswered hitherto. Furthermore, it is important to note that the context of e-business is very distinct and different from traditional offline business in several aspects, indicating that it may be negligent to simply assume that findings regarding proven promotional tactics from the offline world are universally applicable and hence transferrable to the online context. Numerous studies have demonstrated that consumers’ attitudes and behavior in online environments are very different from those in the offline world especially due to the absence of experiential information (Adomavicius et al. 2015; Degeratu et al. 2000; Kim and Krishnan 2013; Shankar et al. 2003). The absence of such information for example leads to greater restrictions in terms of consumers’ abilities in assessing product availabilities in online shopping environments and thus, for better or for worse, effects purchase behavior (Jeong and Kwon 2012). Therefore, we intend to address this research gap by examining the effects of scarcity and a key moderator, namely social proof, specifically in the context of online promotional campaigns of e-businesses. These two tactics are not only
of great practical relevance and are often deployed simultaneously but furthermore are also linked to well established drivers of referral literature.

**Scarcity as Promotional Tactic**

Scarcity describes a state where a shortage exists because the demand for an object exceeds its supply (Kemp and Bolle 1999). According to research, this unavailability may increase an object’s desirability and its perceived value, hence significantly influencing consumers’ decisions (Amaldoss and Jain 2005; Inman et al. 1997; Van Herpen et al. 2009).

In practice, it has become very popular for firms to incorporate scarcity in promotional campaigns when wanting to create a “hype” around their product. The nascent venture Mailbox for example simply launched a landing page with a pre-signup option that emphasized how many other users were in line in front of the current visitor on the waiting list and therefore created a feeling of scarcity among potential customers. This led to over one million signups for its service within only six weeks (Techcrunch 2013). However, also more established firms are increasingly turning to scarcity tactics, like the example of the online retailer Amazon that initially only offered its new kindle tablet as limited edition shows (Forbes 2013b). Furthermore, it has become very common in e-commerce to implement scarcity tactics by simply displaying promotional claims like “only 3 left in stock” (Amazon.com) or also “only 4 deals left” (Groupon.com).

Research states that scarcity evokes a state of physical agitation in which our sole focus becomes to fulfill the need in which we feel our freedom to be threatened (Brehm and Brehm 1981; Cialdini 1993). However, literature differentiates between two types of scarcity based on the cause of limited availability. On the one hand, supply-based scarcity, which originates from deliberate supply limitations (i.e. limited production volumes) like in the case of the limited edition of the Amazon kindle (Verhallen and Robben 1994). This type of scarcity has been attributed positive effects on perceived product value as well as consumer purchasing behavior (Inman et al. 1997; Lynn 1989; Zellinger et al. 1975). According to uniqueness theory, the underlying rationale is that supply-based scarcity affects perceived exclusiveness, a construct that helps consumers fulfill their need to achieve moderate dissimilarity from others through self-identifying personal possessions (i.e., owning things that are more unique) (Fromkin 1970; Hornsey and Jetten 2004; Snyder 1992). Hence, the perceived value of a product decreases when more people own it because consumers are less successful in the pursuit of fulfilling their need for uniqueness (Amaldoss and Jain 2005).

On the other hand, demand-based scarcity arises primarily due to high amounts of prior purchases rather than deliberate supply limitations (Deval et al. 2013; Gierl and Huettl 2010). In this case, scarcity may also positively influence consumer purchasing behavior (Van Herpen et al. 2009; Worcel et al. 1975). However, instead of affecting perceived exclusiveness, demand-based scarcity serves as social validation mechanism and leads consumers to make inferences about social appropriateness, good quality and high product value (Bearden and Rose 1990; Kardes et al. 2004). A plausible explanation for this phenomenon is that people tend to follow each other’s behavior because they believe that others’ choices reveal superior products that they do not want to miss out on (Van Herpen et al. 2009). Van Herpen et al. (2009) for example demonstrate in multiple experiments that it is sufficient for consumers to see the outcome of others’ actions (i.e., reduced availability signals such as empty shelves) for higher product valuations to occur. They also provide evidence for the existence of the relative scarcity concept by demonstrating how consumers choose products which are clearly popular and at the same time less available at the point of purchase. Relative scarcity emphasizes the notion that the effect of scarcity on consumers’ product value perceptions does not only depend on how much of an object is available but also how much of it exists at the time of purchase compared to the past (Gurr 1970; Worcel et al. 1975). Thus, consumers’ beliefs of prior demand are an important moderator for the effect of demand-based scarcity on their product value perceptions.

In practice, e-commerce companies leverage the fact that people tend to follow each other’s behavior (i.e., bandwagon effects) to influence consumers’ decisions by implementing so-called implicit and explicit social proof cues that indicate product demand and popularity (Amblee and Bui 2011; Amblee and Bui 2012; Cialdini 1993). Implicit social proof cues are frequently implemented as banners and may highlight what prominent media the product has been featured in, such as in the case of the multibillion dollar online lodging service airbnb.com in its early days. This may lead to inferences about a larger audience
that knows about a new good or offer and hence suggests greater popularity (Kissmetrics.com 2014). Explicit social proof cues on the other hand are frequently implemented as purchase counters like on groupon.com or also as waiting lists as in the case of Mailbox (Techcrunch 2011b).

Despite the substantial contributions to literature on scarcity effects, the focus hitherto has almost exclusively been on consumer purchase behavior in traditional offline settings (e.g., Inman et al. 1997; Suri et al. 2007) and less on online referral behavior. One notable exception is Cheema and Kaikati (2010) who analyzed the influence of consumers’ need for uniqueness on their willingness to engage in ewom, indicating that supply-based scarcity hampers participation in ewom as it is in conflict with consumers’ pursuit for uniqueness. Nevertheless, there is still a research gap in how demand-based scarcity within online promotional campaigns of e-businesses affects consumer referral behavior. Furthermore, albeit social proof is an established promotional cue that has been examined extensively in the offline context (e.g., Cialdini 1993; Simons 1976) and it has become ubiquitous in the context of e-commerce (Kissmetrics.com 2014), to the best of our knowledge, it has not been examined in conjunction with scarcity in online settings.

**Research Model and Hypotheses Development**

Our research model depicted in Figure 1 illuminates (1) the (main and direct) effect of scarcity on consumer referral propensity (H1), (2) the role of perceived offer value in mediating the effect (H2), and (3) social proof for moderating the preceding mediating effect (H3).

![Figure 1. Research Framework](image)

**Demand-based Scarcity and Consumer Referral Behavior**

Research has demonstrated how scarce products may lead to higher product valuations and hence positively affect consumer purchase behavior because people generally value things that are harder to attain more (Inman et al. 1997; Van Herpen et al. 2009; Worchel et al. 1975). Furthermore, it has been suggested that scarcity triggers an automated thought-process and that it induces a state of physical agitation in which our sole focus becomes to fulfill the need in which we feel our freedom to be threatened, for example by engaging in a purchase (Brehm and Brehm 1981; Cialdini 1993). We propose that under certain circumstances in which opportunities for building social capital are threatened to be squandered, referrals are an equally legitimate reaction.

Consumers pass along information to their peers to build and maintain social capital because it is critical to their personal and professional advancement (Berger 2013; Coleman 1988; Koch 2015; Nahapiet and Ghoshal 1998). Thus, we argue that the referral decision of consumers who strive to build social capital should also be influenced by the value of the information they possess. Incorporating scarcity cues in a promotional campaign is likely to trigger a thought-process which leads consumers to higher valuations of the offer and hence the information at hand (Van Herpen et al. 2009; Worchel et al. 1975). This in turn
will increase their referral propensity because they may feel their freedom to be threatened in the sense of forgoing the possibility of sharing valuable information and therefore pursuing their need to build social capital with their peers. These propositions are in line with the findings of Pihlström and Brush (2008) who found a positive relationship between perceived information value and consumer referral likelihood. In other words, we suggest that a sender’s expectations of building social capital are greater when the offer of the promotional campaign being shared is scarcer, simply because the recipients of the referral will recognize a relatively larger investment on behalf of the sender when the message being shared is scarcer and hence perceived to be more valuable.

This argument does not hold true in the case of supply-based scarcity particularly as it would be highly questionable why a consumer would share a scarce offer instead of hoarding it for themselves. As literature claims, supply-based scarcity is focused on enhancing perceived exclusiveness to help consumers fulfill their need for uniqueness (Van Herpen et al. 2009). Sharing an offer in such situations would be counterproductive because, according to Amaldoss and Jain (2005), the more people own a good the less exclusive and hence valuable it becomes. Therefore, the findings of Cheema and Kaikati (2010) regarding the referral inhibiting effects of consumers’ need for uniqueness are no surprise. However, demand-based scarcity is not focused on perceived exclusiveness or aiding consumers in fulfilling their need for uniqueness (Worchel et al. 1975). Consumers perceive goods that are scarce due to high demand as more valuable because they may make inferences about social appropriateness or superior product quality (Bearden and Rose 1990; Kardes et al. 2004). As bandwagon theory suggests, they may also feel the urge to do what others do and not miss out on an opportunity (Van Herpen et al. 2009). It is not imperative that consumers directly view the actions of others for these effects to arise, viewing the outcomes or appropriate signals of prior demand (i.e., consumption), like for example empty shelves, is sufficient (Van Herpen et al. 2009). Furthermore, in practice consumers normally have secured an offer for themselves before referring it to theirs peers, like the example of Mailbox where one receives notice of one’s own wait list position shows. We therefore relate to situations where consumers need not trade-off benefits and downsides of losing or maintaining their own consumption opportunity. Thus, it is a logical motive for consumers to build on such an information advantage to generate social capital.

Based on the preceding suggestions, we expect that consumers value information they refer to their peers more when the offer in a promotional campaign is comparably scarcer due to social demand. In particular, this is likely to be the case because consumers believe they are providing their peers access to a popular offer which they otherwise would not have had access to and hence would have missed out on. The fact that this offer is scarce further amplifies the value perceptions of the information being shared as it has been demonstrated that people generally tend to assess the value of an object to the extent of its unavailability. In addition, the demand-induced shortage of the offer also imposes a direct pressure on consumers to react by referring the information to their peers before it becomes obsolete. On the contrary, we expect that offers which are not scarce due to social demand do not stimulate the same behavioral responses, as the perceived losses associated with foregoing an opportunity to build social capital is relatively small. Hence, we expect that

**H1:** Consumers will be more likely to refer an online promotional campaign with compared to without demand-based scarcity.

**H2:** Consumers’ perceptions of offer value will mediate the effect of demand-based scarcity on their referral propensity.

**Social Proof as Moderator for the Mediation Effect of Perceived Offer Value**

H1 and H2 propose that scarcity encourages consumer referrals due to the potential gains in social capital, which are higher when an offer is less accessible and hence more valuable. However, extant research posits that consumer’s perceptions of prior demand are an important moderator for how strongly scarcity leads to more favorable valuations (Van Herpen et al. 2009). The suggestion is that when assessing the scarcity of an object it is not only important for consumers to know how much of it exists at the time they are to for example make a purchase decision. It is also critical for them to understand how much of the object exists at that point in time compared to the past to determine the extent of scarcity (Worchel et al.
Hence, any cues which provide information on how strongly the availability has been reduced over time may influence consumers’ perceptions of scarcity.

In the context of e-commerce, so-called social proof cues have been claimed as an effective cue in influencing consumers’ perceptions of demand or popularity regarding a particular product or offer by communicating either explicit (e.g., purchase counters) or implicit (e.g., as seen in media banners) signals of prior consumption behavior (i.e., amount of people that have already purchased a particular product or redeemed a specific offer) (Amblee and Bui 2011; Amblee and Bui 2012; Veit et al. 2014). Implicit social proof cues have a distinct benefit over explicit ones in that they manipulate relative demand perceptions and thus may be effective from the very start without having to reach a certain threshold of prior purchases. The underlying rationale is that in the absence of social proof cues, but even in their presence, consumers’ prior demand perceptions may vary greatly. Hence, implementing an explicit social proof cue like a counter indicating the number of previous buyers may have a positive effect on one consumer to whom that specific number seems high or sufficient but could also result in a negative effect with another to whom that particular number may seem low. Furthermore, even if firms were to manipulate this counter by setting it to a very high number they may be confronted with issues regarding the credibility of their claims. Thus, implicit social proof cues offer an effective and credible alternative as they allow to manipulate prior demand perceptions by signaling to the consumer that a potentially large audience has heard of this particular offering, hence leaving the definition of what is “large” to each person individually.

Thus, based on the notion that information on how availability has been reduced over time influences consumers’ scarcity perceptions, we argue that when scarcity is combined with implicit social proof cues, which is often the case in practice (e.g., in promotional campaigns of many e-businesses), its positive effect on the offer’s perceived value is amplified. This is the case because consumers are likely to attribute great importance to signals that indicate the popularity of the offer and hence let them better understand how the availability of the offer has been reduced. More specifically, this additional information regarding the offers’ popularity enables them to make inferences about what the offer’s availability was in the past compared to now and aids them in reducing any decision uncertainties they may have (Gurr 1970; Worchel et al. 1975).

In sum, we thus suggest that campaigns including demand-based scarcity cues lead to higher referral likelihood when implicit social proof cues are present compared to when they are absent due to higher offer valuations. Therefore, we hypothesize that

**H3: Social proof moderates the mediating effect of perceived offer value on the relation between scarcity and referral propensity, such that the mediated effect of scarcity on referral propensity through perceived offer value is amplified when social proof is present.**

**Research Methodology**

**Experimental Design and Treatments**

We cooperated with a German startup named Blinkist to conduct a randomized online experiment. Blinkist is a globally operating popular online service that provides summaries of nonfiction books’ key insights and delivers these via text or audio through its website as well as its iPhone and Android application. The venture has been featured by many famous media outlets such as Forbes, Techcrunch and others. The online experiment focused on testing different minimal landing pages regarding their referral effectiveness so that Blinkist could subsequently choose which landing page to use for the global rollout of its promotional campaign. Hence, the experiment did not take place on the venture’s official website but on a separate, publicly not visible landing page.

Consistent with the sampling and procedures in previous online experiments (e.g., Ho et al. 2011; Lowry et al. 2013), we recruited participants for the online experiment via e-mail from a representative student subject pool maintained by a large public university in Germany. Subjects were motivated to partake in the study in exchange for a small fee of 2$.

We employed a 2 (scarcity: presence vs. absence) x 2 (social proof: presence vs. absence) between-subjects, full-factorial design. All treatments of scarcity were combined with the social proof treatments on the main campaign landing page, resulting in a total of four experimental conditions (see Figure 2 and
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The landing page promoted a special offer which allowed participants to secure a 30 day free trial instead of the regular trial that only lasted 3 days. Aside from details about the features of the special offer, the main campaign landing page contained a Learn More button that linked to a video which explained the service, a continue button, as well as a promotional statement and a reference bar (our manipulations) which altered in terms of scarcity (present, absent) and personalization (present, absent) levels (see Figure 2 and 3 for two examples).

The experiment proceeded in the following manner: First, participants were given the instruction to look into the promotional campaign of a new online service named Blinkist and to give feedback. They were told to press a “Continue” button on the main campaign website once they were done with reviewing and want to proceed to the feedback step (see Figures 2 and 3). Second, after viewing the instructions, they were forwarded to the main campaign landing page and randomly assigned to one of the four experimental conditions. Here, after pressing the “Continue” button they were provided the opportunity to refer the offer to their friends via a share prompt that, when triggered, gave them the option to log into their Facebook network or enter e-mail addresses of their peers. The purpose of this referral prompt remained obscure throughout the entire experiment and it was not communicated in the instructions at the beginning. Rather, as previously suggest the instructions clearly emphasized the participant’s contribution in providing feedback. Choosing this option led to the direct distribution of Blinkist’s promotional campaign to their peers. After this step, participants were forwarded to a web page containing the post-experimental questionnaire. All participants also had the choice to opt out via a non-share button and were then directly forwarded to the site with the post-experimental questionnaire. In the last step, a post-experimental questionnaire captured participants responses to questions measuring perceived offer value, control variables, manipulation checks, and several other variables (see Variables Measured and Measurement Validation). Participants were debriefed and thanked for their participants at the end of the survey.

**Variables Measured and Measurement Validation**

We devised our manipulation for scarcity based on Highhouse et al. (2008) and Barone and Roy (2010) by restricting the number of spots that were remaining for participating in the offer on a first-come-first-serve basis. This included an unlimited variant (scarcity not present) and a variant that was limited to 15 participants (scarcity present). Scarcity was manipulated in a separate text box on the landing page (see Figure 2 and 3) containing the lines “15 spots remaining (first come first served)”. Social proof was implemented as an implicit variant, thereby displaying a “As seen on” bar that listed all media which the
venture had been mentioned in (see Figure 3), like it is also common practice in the real world (Kissmetrics.com 2014).

To develop the stimuli for our studies, we conducted a pretest in which 50 participants (48% females, Mage = 26.3) were randomly assigned to one of the four treatments. The manipulation check of scarcity (present vs. absent) showed that participants perceived the condition containing the scarcity cue as significantly scarcer than the control condition ($F(1, 49) = 52.36$, $p < .001$). Similarly, the manipulation check of social proof (present vs. absent) confirmed that participants had higher demand perceptions when the cue was present than in the control condition ($F(1, 49) = 16.21$, $p < .001$). Furthermore, we also measured consumers' perceptions of demand or popularity in the absence of social proof to ensure that participants perceived scarcity to be based on excess demand rather than supply limitations. The reason for measuring it this way is that social proof is a direct manipulator of perceived demand and we wanted to rule out the cue’s effect on demand perceptions when assessing the validity of the demand-based scarcity manipulation. The results suggested that consumers truly perceived the offer in the scarcity condition to be more in demand (more popular) than that in the control condition ($F(1,21) = 7.388$, $p < .05$), therefore confirming that consumers perceived scarcity to be caused by high demand.

Our dependent variable referral propensity was measured binary (referred vs. not referred) in line with (Stein and Ramaseshan 2014) based on actual referral behavior which was collected via clickstream data during the online experiment. Perceived offer value was measured by adapting three items from Suri et al. (2007).

We chose to measure several control variables that have been identified as the most salient referral drivers in extant literature (i.e., privacy concerns, product involvement need for uniqueness, offer relevance and image-impairment concerns). Information privacy concerns were measured with respect to sharing information online by using three items from Sutanto et al. (2013). Furthermore, product involvement was recorded by adapting one item from Zaichkowsky (1985). Need for uniqueness was measured based on an abridged scale of three items in accordance with Tian et al. (2001). We also quantified information relevance to others to account for differences in participants’ perceptions regarding the offer’s relevance to theirs peers by adapting one item from Hupfer and Detlor (2006). Lastly, Image-impairment concerns were measured via three items from Argo et al. (2006). A 7-point Likert scale was adopted for all measures with anchors ranging from strongly disagree (1) to strongly agree (7). Information on all constructs and items can be found in Table 1 of the appendix.

Confirmatory factor analysis (CFA) revealed that all scales exhibited satisfactory levels of convergent validity and each scale’s average variance extracted (Awad and Krishnan 2006) exceeded multiple squared correlations, resulting in all discriminant validity requirements being met (Fornell and Larcker 1981). All latent variables were averaged to form composite scores for further statistical analysis as they displayed adequate internal consistency.

Besides rating perceived scarcity (i.e., “The offer that I viewed in the promotional campaign is scarce”) and perceived popularity (i.e., “The offer that I viewed in the promotional is redeemed a lot”) on a 7-point Likert scale, participants were asked two closed questions in the post-experimental questionnaire: (1) Did you recall seeing a Wall Street Journal, New York Times, Financial Times or Forbes reference when you viewed the main campaign landing page? [Yes or No], and (2) How many free spots were indicated to be remaining when you viewed the campaign landing page? [Unlimited, 50, or 15 spots].

**Results**

**Sample Description, Control and Manipulation Checks**

Out of the 214 subjects from the online pool that were invited to the study, 135 answered our invitation e-mail (response rate: 63%). Seventeen participants (12.6%) were removed from the sample: eight subjects failed to complete the questionnaire and nine moved to quickly through the experiment as indicated by a clickstream analysis and an attention filter question. Hence, we used a sample of 118 subjects in the following analysis, of which 49 were females and 69 males, with average age of 35.99 years, ranging from 19 to 69. Table 1 summarizes the descriptive statistics.
We compared both early and late respondents (first and last 50) based on their socio-demographics to rule out a non-response bias (Armstrong and Overton 1977). The results indicated no significant differences between the means of each sample ($p > 0.05$), suggesting that a non-response bias was unlikely to have affected our results. We also believe it is unlikely that our incentives lead to a biased sample selection within the subject pool because the basic demographics (e.g., age, income, gender) between the respondents and the overall pool population were not significantly different ($p > 0.1$).

Furthermore, we conducted several one-way ANOVAs to confirm that the random assignment of participants to the experimental conditions was successful. The results did not indicate any statistically significant difference in product involvement ($F = 0.712, p > 0.05$), information relevance to others ($F = 0.848, p > 0.05$), privacy concerns ($F = 0.418, p > 0.05$), need for uniqueness ($F = 1.002, p > 0.05$), image-impairment concerns ($F = 0.424, p > 0.05$), age ($F = 1.108, p > 0.05$) or gender ($F = 1.148, p > 0.05$) between all experimental groups, hence suggesting that randomization was successful. Based on the data provided by Blinkist we were able to verify via clickstream analysis that participants who triggered the share button also actually referred the promotional campaign.

As in the pretest, the manipulation checks indicated that participants rated spots remaining in the scarcity conditions ($M = 5.18; SD = 0.96$) to be significantly more limited than in the no scarcity conditions ($M = 2.91; SD = 1.14$) ($F(1,117) = 137.281, p < 0.001$). In addition, it could also be confirmed that participants asserted scarcity to be due to high demand rather than limited supply, as the subjects rated the offer in the scarcity condition ($M = 4.54; SD = 1.07$) to be significantly more popular or in demand than in the control condition in the absence of social proof ($M = 3.37; SD = 1.21$) ($F(1,117) = 13.806, p < 0.001$). Furthermore, the results also indicated that demand or popularity perceptions in the social proof conditions ($M = 4.45; SD = 1.35$) were significantly higher than in the no social proof conditions ($M = 3.94; SD = 1.28$) ($F(1,117) = 4.261, p < 0.05$). Finally, we determined that all participants passed our tests regarding the two closed manipulation check questions for the four different conditions, implying that the manipulations were successful.

<table>
<thead>
<tr>
<th>Table 1: Descriptive statistics</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td><strong>Demographics</strong></td>
</tr>
<tr>
<td>Gender (Females)</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td><strong>Controls and Mediators</strong></td>
</tr>
<tr>
<td>Product Involvement</td>
</tr>
<tr>
<td>Privacy Concerns</td>
</tr>
<tr>
<td>Need for Uniqueness</td>
</tr>
<tr>
<td>Information Relevance Others</td>
</tr>
<tr>
<td>Image Impairment Concern</td>
</tr>
<tr>
<td>Perceived Offer Value</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
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<tr>
<td>Referral</td>
</tr>
</tbody>
</table>

**Note:** means and standard deviations, $N = 118$. 

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**Hypothesis Testing**

**Main Effect Analysis for Scarcity**

To test H1, we performed a two stage hierarchical logistic regression on the dependent variable referral propensity (see Table 2). We first entered all controls as well as the mediator perceived offer value (Block 1) and then included the manipulations scarcity and social proof (Block 2). Nagelkerke's $R^2$ was examined and $\chi^2$-Statistics were computed to analyze the model's significance for both stages. Aside from scarcity and perceived offer value ($p < 0.05$), for which we expected a positive effect on referral propensity, neither social proof nor any of the controls showed a statistically significant direct effect on referral propensity (see Table 2).

The results of the logistical regression demonstrated a statistically significant main effect for scarcity ($b = 1.309$, Wald statistic $(1) = 4.614, p < 0.05$) as well as perceived offer value ($b = 0.651$, Wald statistic $(1) = 4.406, p < 0.05$). Hence, in support of H1, our findings show that participants primed with scarcity are significantly more likely to make a referral than those not primed with scarcity ($12\%$ vs. $46\%, t = 18.150, p < 0.001$) regardless whether the campaign contained social proof cues or not. This suggests that confronting recipients in a promotional campaign with scarcity significantly increases the likelihood of them referring the offer to their peers.

**Table 2. Logistical regression on referral propensity**

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>SE</td>
</tr>
<tr>
<td>Intercept</td>
<td>-5.038*</td>
<td>2.096</td>
</tr>
<tr>
<td><strong>Manipulations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scarcity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Proof</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controls &amp; Mediators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-0.039</td>
<td>0.503</td>
</tr>
<tr>
<td>Age</td>
<td>-0.005</td>
<td>0.022</td>
</tr>
<tr>
<td>Product Involvement</td>
<td>0.047</td>
<td>0.197</td>
</tr>
<tr>
<td>Privacy Concerns</td>
<td>-0.190</td>
<td>0.143</td>
</tr>
<tr>
<td>Need for Uniqueness</td>
<td>0.069</td>
<td>0.150</td>
</tr>
<tr>
<td>Offer Relevance Others</td>
<td>0.024</td>
<td>0.239</td>
</tr>
<tr>
<td>Image Impairment Concern</td>
<td>-0.070</td>
<td>0.339</td>
</tr>
<tr>
<td>Perceived Offer Value</td>
<td>1.051**</td>
<td>0.270</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>115.743</td>
<td></td>
</tr>
<tr>
<td>Nagelkerke $R^2$</td>
<td>0.298</td>
<td></td>
</tr>
<tr>
<td>Omnibus Model $\chi^2$</td>
<td>27.737**</td>
<td></td>
</tr>
</tbody>
</table>

*Note: $^* p < .05; ^{**} p < .01; N= 118.*

**Mediation Analysis for Scarcity**

In our mediation hypothesis H2, we had argued that scarcity cues' impact on consumers' sharing propensity would be driven by perceptions of offer value. Thus, in a mediation model using bootstrapping with 1,000 samples and a 95% bias-corrected confidence interval, we tested the indirect effect of scarcity

---

1 We interpret the significant mediator perceived offer value when we look at its mediating role between scarcity and consumer referral propensity.
on referral propensity through perceived offer value. The mediation analyses was performed using the bootstrap mediation technique (PROCESS macro; Hayes (2013)).

To investigate the process driving the effect of scarcity on referral propensity, we entered perceived offer value as potential mediator between scarcity and referral behavior. The indirect effect of scarcity on referral propensity through perceived offer value was statistically significant (i.e., perceived offer value significantly mediated the relationship: indirect effect = 0.696, standard error = 0.4, 95% bias-corrected confidence interval (CI) = [0.028, 1.494]), supporting H2. Furthermore, scarcity was positively associated with perceived offer value (b = 1.069, p < 0.001), and higher perceptions of offer value were associated with higher probability of making a referral (b = 0.651, p < 0.05; see Figure 5), while scarcity’s direct effect on referral propensity remained significant after perceived offer value was entered into the model, representing the case of a partial mediation (Hayes 2013). Hence, these results showed that perceived offer value significantly mediated the impact of scarcity on referral behavior, such that, as per our proposition, scarcity produced higher perceptions of offer value, which in turn lead to a higher likelihood of referring the promotional campaign.

**Figure 4. Mediation Results**

**Moderated Mediation Analysis for Scarcity**

We hypothesized that the indirect effect of scarcity on referral propensity through perceived offer value is moderated by social proof. Therefore, in accordance with Hayes (2013), we drew on a moderated mediation model using bootstrapping with 1,000 samples and a 95% bias-corrected confidence interval to test the conditional indirect effect of scarcity on referral propensity through perceived offer value.

The moderated mediation analysis was based on two separate multiple regression models. The first model included scarcity, social proof, the interaction term, and all controls as independent variables and perceived offer value as the dependent variable. This model revealed a positive, statistically significant interaction term (b = 0.729, p < 0.05), indicating that there was a moderation effect between scarcity and the mediator, therefore supporting H3. As depicted in Hayes (2013, model 7), the predictors in the second model included scarcity, perceived offer value as well as all controls; the dependent variable was referral propensity. This model revealed a significant direct effect of perceived offer value (b = 0.79, p < 0.01) as well as scarcity (b = 1.149, p < 0.05) on referral propensity. In addition, Table 3 sheds further light on how the indirect effect of scarcity on referral propensity via perceived offer value was stronger when social proof was present compared to when it was absent.

| Table 3. Conditional indirect effect of scarcity on referral propensity contingent on social proof |
|-----------------------------------------------|------------------|-----------------|------------------|
| Coefficient | Boot SE | BootLLCI | BootULCI |
| No Social Proof | 0.5402 | 0.3621 | 0.0854 | 1.1709 |
| Social Proof | 1.1166 | 0.5920 | 0.2543 | 2.1026 |

*Note: Coefficients were computed based on moderated mediation analysis incl. all controls and using bootstrapping with 1,000 samples and a 95% bias-corrected confidence interval (Hayes 2013)*
How Scarcity and Social Proof Affect Online Referrals

Hence, scarcity, in combination with social proof leads to greater referral propensity due to consumers’ higher perceptions of the offer’s value (as depicted in Figures 6 and 7). In fact, an ancillary analysis further supported the finding that social proof lead to statistically significant higher offer valuations (4.79 vs. 5.77, \( t = 20.77, p < 0.001 \)) as well as referral propensity (31% vs. 57%, \( t = 4.34, p < 0.05 \)) when it was incorporated in a promotional campaign containing scarcity. However, it did not demonstrate the same effect on offer valuations (\( p > 0.05 \)) or referral propensity (\( p > 0.05 \)) when scarcity was absent.

Overall, as predicted, these results suggest that participants were more likely to make a referral of a scarce promotional campaign when it contained a social proof cue opposed to when it didn’t, because this resulted in even higher offer value perceptions, thus resulting in a higher likelihood of referring the online promotional campaign.

![Figure 5. Effect of Social Proof on Perceived Offer Value](image)

![Figure 6. Effect of Social Proof on Referral Propensity](image)

Discussion

Against the backdrop that firms, and especially IT startups for credibility gains, are increasingly relying on online referrals when generating awareness around their offerings and acquiring new customers, this experimental study aimed to shed light on the potential of classical promotional tactics in enhancing consumers’ referral propensity of online promotional campaigns. We illuminated the potential of scarcity and social proof, as prior research on these promotional cues has demonstrated their influence on factors which are well established drivers of online referral literature and these tactics are often employed in online promotional campaigns together in practice.

Our results support the premise that demand-based scarcity has a positive causal effect on consumers’ referral propensity. Moreover, perceived offer value was revealed as partial mediator in the relationship between scarcity and consumer referral likelihood. The underlying theoretical explanation is that consumers may believe to build more social capital when referring a scarcer offer because they perceive the value of the information they are sharing to be greater. Furthermore, the fact that the offer is so limited may also impose direct pressure on consumers to make the referral as fast as possible because the information at hand will become obsolete as time passes. Our mediation results also showed that scarcity’s effects were not due to image-impairment concerns, need for uniqueness, privacy concerns, product involvement or offer relevance to others, hence ruling out salient alternative drivers of referral engagement. In addition, we found that social proof acts as significant moderator in the mediating role of perceived offer value. Our results suggest that promotional campaigns including demand-based scarcity cues lead to higher referral likelihood when implicit social proof cues are present compared to when they are absent due to higher offer valuations. We believe this is the case because consumers are likely to attribute great importance to signals that indicate the popularity of the offer (i.e., social proof) as this additional information enables them to make inferences about what the offer’s availability was in the past.
compared to now (i.e., interpretation of relative scarcity) and thus helps them in reducing decision uncertainties.

Our study contributes to ewom literature at the cross-section of IS and marketing in expanding our understanding of the antecedents of ewom behavior in general and online referral behavior in particular. First, we introduce previously underexplored catalysts of consumer referral behavior and provide a validated model through which we illuminate the psychological processes underlying the promotional cues’ effects in the context of an online, real world setting measuring actual referral behavior. Second, we analyze two proven promotional tactics from the offline world online. We therefore contribute towards research that deals with the absence of experiential information online by evaluating the effectiveness of signaling mechanisms that may serve as substitutes for some of the information shortcomings and hence support consumers in their decision making process. Third, we examine how social proof cues, which are popular and are often combined with scarcity in practice, affect the mediating relationship between scarcity and perceived offer value, thereby explicating a moderator for the effect of scarcity on consumer referral propensity. Lastly, our study focuses on referral decisions of first stage actors when initiating viral marketing campaigns, unlike extent research, which has largely placed and emphasis on second stage actors (e.g., De Bruyn and Lilien 2008; Gu et al. 2012). First stage actors have a critical role in creating social contagion because the ability to reach second stage actors is contingent on their referral decisions.

While the preceding paragraph highlighted our theoretical contributions, there are also several practical implications that need to be pointed out. Our findings imply that e-businesses need to employ scarcity cues and if possible supplement these with implicit social proof cues (i.e., signals that manipulate relative demand perceptions like banners indicating what media outlets one has been featured in) when seeking to increase consumer referral likelihood of their online promotional campaigns. In any case, even when social proof is not a viable option, scarcity cues should be incorporated as facilitator of consumer referrals. Furthermore, firms should pay attention to and leverage peoples’ need to build social currency in design decisions of their promotional campaigns to drive consumer referral likelihood and therefore the awareness of their offerings.

Limitations, Future Research and Conclusion

The findings of our study need to be interpreted in light of some noteworthy limitations that also provide avenues for future research. First, caution should be taken when drawing conclusions from one single study. While we chose to conduct our study in a context with broad applicability, we analyzed how scarcity and social proof cues affect referral propensity in the context of e-business and with a special focus on a digital experience good. Future research should examine how these cues work in other business model contexts (e.g., freemium) and for different kinds of goods (e.g., search products). Second, we showed how implicit social proof cues may be used to manipulate prior demand or consumption perceptions when consumers are confronted with a lot of uncertainty, as is often the case with novel offerings. However, for firms that cannot draw on implicit cues (e.g., they have not been featured in the media), explicit social proof cues (e.g., prior purchase counters) may be an effective alternative once a certain purchase threshold is reached. Future studies should examine how best to determine whether and when it may be effective to draw on explicit cues and how these may influence other important criteria such as firm or offer credibility. Finally, the nature of the study only allowed for observing the influence of the promotional cues on referral decisions of first stage actors. The fact that second stage actors come by a promotional offer through a referral may be interpreted as an additional signal of higher demand and hence further amplify the effects of scarcity on consumer referral propensity. Thus, future research should also pay attention to how scarcity affects referral decisions across different stages of dissemination.

Overall, this study illuminated the potential of promotional cues in enhancing consumer referral likelihood in the context of online promotional campaigns. We contribute towards the understanding of the antecedents of online referrals, which are increasingly being leveraged especially by nascent IT ventures due to credibility gains, when generating awareness around their offerings and acquiring new customers. We hope that our results provide impetus for further analysis of design components that may be leveraged in online promotional campaigns to further increase consumer referral propensity.
## Appendix

### Table 1

<table>
<thead>
<tr>
<th>Measurement Scales</th>
<th>Item (all 7-Point Likert)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived popularity</td>
<td>1. This offer is popular&lt;br&gt;2. I think that many people want to redeem this offer&lt;br&gt;3. This offer is redeemed well</td>
</tr>
<tr>
<td>Van Herpen et al. (2009) &lt;br&gt; ($\alpha = 0.86$, $CR = 0.9$, $AVE = 0.81$)</td>
<td></td>
</tr>
<tr>
<td>Perceived offer value</td>
<td>1. I think that given this offer’s attributes, it is a good value&lt;br&gt;2. At the advertised conditions, I feel that I am getting a good quality offer&lt;br&gt;3. If I redeemed this offer at the advertised conditions I feel I would be getting good value</td>
</tr>
<tr>
<td>Suri and Monroe (2003) &lt;br&gt; ($\alpha = 0.84$, $CR = 0.87$, $AVE = 0.73$)</td>
<td></td>
</tr>
<tr>
<td>Information privacy concerns</td>
<td>1. I am concerned with how information about me may be exploited by Blinkist&lt;br&gt;2. I am concerned that my privacy has been compromised by Blinkist&lt;br&gt;3. I am concerned that my personal information may be kept in a non-accurate manner by Blinkist</td>
</tr>
<tr>
<td>Sutanto et al. 2013 &lt;br&gt; ($\alpha = 0.82$, $CR = 0.87$, $AVE = 0.73$)</td>
<td></td>
</tr>
<tr>
<td>Product involvement</td>
<td>1. I am interested in book summary services like Blinkist</td>
</tr>
<tr>
<td>Zaichkowsky (1985)</td>
<td></td>
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<tr>
<td>Need for uniqueness</td>
<td>1. I collect unusual products as a way of telling people I’m different&lt;br&gt;2. When products or brands I like become extremely popular I lose interest in them&lt;br&gt;3. I have sometimes purchased unusual products or brands as a way to create a more distinctive personal image</td>
</tr>
<tr>
<td>Tian et al. (2001) &lt;br&gt; ($\alpha = 0.82$, $CR = 0.79$, $AVE = 0.84$)</td>
<td></td>
</tr>
<tr>
<td>Information relevance to others</td>
<td>1. I believe information about this offer could be relevant to my peers</td>
</tr>
<tr>
<td>Hupfer and Detlor (2006)</td>
<td></td>
</tr>
<tr>
<td>Image-impairment concerns</td>
<td>1. I feel embarrassed for my buying mistakes&lt;br&gt;2. Consumers need to worry about how other people view them&lt;br&gt;3. Looking like a smart shopper is important for me</td>
</tr>
<tr>
<td>Zhang et al. (2014) &lt;br&gt; ($\alpha = 0.81$, $CR = 0.85$, $AVE = 0.73$)</td>
<td></td>
</tr>
<tr>
<td>Perceived Scarcity</td>
<td>1. I think this promotional offer is scarce</td>
</tr>
</tbody>
</table>
References


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How Scarcity and Social Proof Affect Online Referrals


