The effectiveness of number of deals purchased in influencing consumers' response to daily deal promotions: A cue utilization approach

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ABSTRACT
This research proposes and empirically tests a theoretical model of consumers' response to online daily deal promotions. A unique feature of such promotions is their social influence, as they provide information about how many others have already purchased the offer. Integrating cue utilization and social influence theories, the model outlines how the social cue about the number of deals purchased by others influences consumers' deal evaluations and purchase intentions across a variety of conditions. The research findings indicate that the number of deals as an extrinsic cue affects consumers' deal evaluations and intentions only when intrinsic product and deal cues (good vs. service, discount size) and consumer personal characteristics (familiarity with the provider) are not present or are insufficient to infer deal attractiveness. The research offers managerial implications with respect to effectively designing and promoting online daily deals.

1. Introduction

With increasing prevalence of Internet and social media, online buying and consumption are becoming increasingly more public and social. We write reviews, read reviews, post our purchases to Facebook, tweet about them on Twitter, and follow other people and their purchases. Online retailers and Internet group buying sites provide platforms for such social interactions. Even price promotions have become social. For example, group-buying websites, such as Groupon or Living Social, offer heavily discounted daily deals, assuming that a sufficiently large group of buyers purchases within the same time frame. One unique feature of such online promotions is that they typically display how many deals have been purchased already along with the product and price discount information for every deal. The number of deals purchased by others informs consumers about how their social group (in this case, other consumers) is behaving with respect to a specific daily deal. As such, the number of deals purchased indicator represents a social cue – i.e., a cue about the behavior of the social group with respect to a specific daily deal.

While online price promotions are not new, the additional social cues on these websites provide an opportunity to study the effect of the social cue and how it interacts with other cues, such as deal characteristics and consumer dispositional characteristics.

In this research, the authors integrate the literature on social influence (Cialdini & Goldstein, 2004) with cue utilization theory (Olson, 1977; Rao & Monroe, 1988; Szybillo & Jacoby, 1974) to develop and empirically test a theoretical model of consumer response to daily deal promotions. The paper predicts that the number of deals purchased by others as a social cue influences both consumers' social (i.e., deal attractiveness to others or deal popularity) and individual evaluation of the deal (i.e., perceived deal attractiveness to the focal consumer). The model further outlines the conditions under which these effects are present. The paper theorizes and empirically demonstrates that the number of deals purchased, as an extrinsic cue, only affects consumers' responses when intrinsic product and deal cues and consumer dispositional cues are unavailable or insufficient for deal attractiveness assessment. The authors define an extrinsic cue as a characteristic that is external to the product/deal under the consideration, such as a contextual factor. An intrinsic cue is a key characteristic of the product/deal under consideration, such as the nature of the product and discount size of the deal. This research proposes that in the daily deal setting, consumers are primarily driven by the deal rather than a predefined goal of purchasing a specific product or service; hence a reference point utilized by consumers should be the deal (not just the underlying product). Therefore, deal characteristics such as discount size are considered an intrinsic cue for evaluation in this context. Dispositional cues refer to consumers' personal traits, characteristics, or experiences that may influence their response to the deal, such as familiarity with the service provider in the present research.

While research has shown that the number of deals purchased does

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indeed influence consumer evaluation (Coulter & Roggeveen, 2012), the key contribution of this research is in identifying the moderating role of product type, provider familiarity, discount size and sale prominence. None of these variables have been previously shown to interact with the number of deals purchased to affect consumer response to daily deal promotions. In addition to identifying moderating factors, this research proposes that in the daily deal context, the reference points utilized by consumers as intrinsic could include key deal characteristics, such as discount size.

In addition to theoretical and empirical contributions, the research offers managerial implications with respect to effectively designing and promoting online daily deals, specifically with regards to under what conditions to utilize a number of deals indicator and in what form.

2. Background information

Daily deal websites offer a variety of products and services at large discounts (as high as 95% off) and typically attract a large number of customers in a short period of time. The number of deals purchased can range from a dozen to thousands. Groupon, the largest daily deal website, reported having 49 million active customers and 700,000 active deals during the first quarter of 2016. Its quarterly revenue topped $732 million dollars, with an annual revenue exceeding $3 billion (Groupon, 2016).

Given the recent ascent in online daily deal popularity, research on consumer response to daily deal promotions remains limited. Existing research on the topic focuses on the seller’s perspective, such as factors that influence consumers’ intention to use these sites (Cheng & Huang, 2013), factors that influence the number of deals sold (Liu & Sutanto, 2012), and the profitability of such deals (Jing & Xie, 2011; Kumar & Rajan, 2012). However, given the social nature of these group-buying websites, one unique feature is the social cue they provide – the number of deals already purchased by others. Coulter and Roggeveen (2012) showed that consumers are indeed sensitive to this social cue and deal characteristics, such as purchase quantity and time restriction, influence its effectiveness. Luo, Andrews, Song, and Aspara (2014) examine the effect of deal popularity on purchase likelihood and time to redeem. The present work builds upon the existing research and extends it to investigate three new moderators of this important cue, trying to determine how this social cue interacts with other cues, such as intrinsic product/del cue and consumer individual characteristics. In addition, building upon cue utilization theory (e.g., Alford & Biswas, 2002; Grewal, Marmorstein & Sharma, 1996; Krishnan, Biswas & Netemeyer, 2006; Sengupta, Goodstein & Boninger, 1997; Slovic & Lichtenstein, 1971) and social influence theory (Cialdini & Goldstein, 2004), we propose a theoretical mechanism that includes consumers’ social and individual evaluations of the deal.

3. Conceptual model

3.1. Number of deals purchased as a social cue

Consumers use a variety of cues in their decision making (Easterbrook, 1959). Some cues influence the formation of individual attitudes and intentions toward the product or service (e.g., intrinsic cues associated with product attributes, price, etc.), while other cues influence consumers’ inference of attitudes and intentions of others (Kurt, Inman & Argo, 2011; Luo, 2005; Söderlund, 2011). In the online daily deal context, the number of deals purchased by others is an extrinsic social cue. It influences both consumers’ own assessment of the deal (i.e., individual evaluations) and perception of others’ assessment of the deal (i.e., social evaluations). Both individual intentions and those of others influence purchase decisions (Luo et al., 2014).

As humans are fundamentally motivated by meaningful relationships with others (Cialdini & Goldstein, 2004), social cues, i.e., the behavior, perceptions and attitudes of others, may be an important cue in consumer buying decisions on daily deal websites. We tend to conform with others (Bearden & Rose, 1990; Cialdini & Goldstein, 2004) and believe that others provide information (Stock & Balachander, 2005) that can make our evaluation more accurate (Cialdini & Goldstein, 2004).

Even a mere presence of others can affect consumers’ behavior (Becker, 1991; Brocato, Voorhees & Baker, 2012). For example, the number of customers in a restaurant increases the likelihood of others choosing that restaurant, especially at the pre-encounter stage (Kim & Lee, 2012). Further, consumers’ motivation to buy is enhanced by sales volume and positive customer reviews, indicating herd behavior (Hanson & Putler, 1996; Huang & Chen, 2006; Liu & Sutanto, 2012). Such influence may be due to inferences of the product performance or service outcome, especially when consumers are uncertain about or unfamiliar with the product or service provider (Deutsch & Gerard, 1955). High demand signals high performance and reduces perceived purchase risk and increases confidence in the item, hence increasing perceived attractiveness of the deal and enhancing one’s desire to buy (Chen & Wu, 2010). Therefore, a high number of deals purchased by others should enhance perceptions of attractiveness of the deal, partly due to conveying information about other consumers’ behaviors, thus signaling popularity of the deal, similar to relative scarcity of a product (Lynn, 1989; Parker & Lehmann, 2011).

H1a. The number of deals purchased has a positive effect on the perceived attractiveness of the deal.

The role of this social cue has not received much attention in the context of online promotions. While Coulter and Roggeveen (2012) explored the influence of this cue on purchase intention, they focused on the time and quantity aspects of the deals and limited the influence to the scarcity effect and identified perceived value and regret as the underlying mechanisms. Kukar-Kinney, Scheinbaum, and Schaeters (2016) determined that the number of deals purchased cue more strongly influences compulsive than non-compulsive buyers. In the present research, the authors further examine the effect of this social cue by investigating its effect on individual as well as social evaluations (i.e., deal popularity and deal attractiveness) and extend our understanding of its role by examining under what conditions it is utilized.

Deal popularity refers to the consumer perceptions that the deal is in high demand and attractive to a large number of (other) buyers (i.e., social evaluation). The number of deals purchased indicator represents a “purchase counter” and should as such positively affect perceptions of how well received the deal is by others. This perception then influences consumers’ perceived deal attractiveness, or the extent to which the deal is perceived as attractive to others. This perception then influences consumers’ perceived deal attractiveness, or the extent to which the focal consumer evaluates the deal as appealing directly to him or her (i.e., individual evaluation). Literature suggests that popularity influences attractiveness in two ways. When consumers’ identity is salient, popularity may interfere with consumers’ desire for self-enhancement, influencing them to deliberately diverge from others (Berger & Heath, 2007). In this case, uniqueness and exclusivity, rather than popularity, enhance the attractiveness of the offer (Barone & Roy, 2010). On the other hand, perceived popularity may enhance deal attractiveness due to social influence and the herd effect (Huang & Chen, 2006). In the daily deal promotion context, buyers are geographically scattered and do not know each other, making the threat to consumers’ identity unlikely. Moreover, exclusivity typically is not an issue, as any consumer is eligible to purchase the deal, as long as the supplies last. Hence, a positive effect of perceived popularity on deal attractiveness is predicted. In sum, we propose:

H1b. The positive effect of the number of deals purchased on deal attractiveness is mediated by perceived deal popularity.

In addition, it has been well established that attractive deals further enhance intention to purchase (Inman, Peter & Raghubir, 1997).

H1c. Perceived deal attractiveness positively influences purchase
intuitions.

In summary, the three parts of hypothesis 1 jointly represent the base conceptual model, which explains the effect of the number of deals purchased on perceived attractiveness and popularity of the deal, as well as the subsequent effect on purchase intentions.

While the number of deals purchased is an important social cue, there are other cues consumers may consider while shopping on daily deal sites. Consistent with cue utilization theory, the number of deals purchased by others, as a social cue and extrinsic in nature, is likely to be utilized in conjunction with other cues (e.g., Alford & Biswas, 2002; Grewal, Marmorstein, & Sharma, 1996; Krishnan, Biswas, & Netemeyer, 2006; Sengupta, Goodstein, & Boninger, 1997; Slovic & Lichtenstein, 1971). The more diagnostic the cue is, the more likely it will be used (Dick, Chakravarti & Biehal, 1990). Therefore, it is important to determine under which circumstances this cue effectively influences consumers’ evaluations and intentions. We next propose and examine moderators of the degree to which consumers utilize the number of deals purchased in deal evaluation and decision making.

3.2. Factors moderating the effectiveness of the cue in influencing deal attractiveness

While the number of deals purchased as a social cue affects perceived deal attractiveness through deal popularity, as we argued, it is an extrinsic cue. On the other hand, deal evaluation is also driven by intrinsic deal cues including specific product characteristics (e.g., type of product/service) and deal characteristics (e.g., discount size). In addition, how attractive the deal is to an individual consumer is also directly affected by consumers’ individual characteristics or experiences, such as familiarity with the product or service provider (Lee & Lou, 1995). Research indicates that in evaluating a potential purchase, consumers integrate information from various sources (Alba, Mela, Shimp & Urban, 1999). Intrinsic information is generally weighted heavier because it is deemed more diagnostic and useful (Rao & Monroe, 1988; Szybillo & Jacoby, 1974). On the other hand, extrinsic cues play a more important role when intrinsic information is scarce (Aldeniz, Calantone & Voorhees, 2013; Miyazaki, Grewal & Goodstein, 2005). Thus, we propose that the number of deals purchased functions as an extrinsic cue, and it interacts with both intrinsic and dispositional cues to influence perceived deal attractiveness only when other cues are not sufficiently diagnostic.

3.2.1. Goods vs. services

The presence of others influences consumers’ experiences and evaluations of services (Grove & Fisk, 1997). Services are intangible and inseparable, and considered to be experience products, which makes an evaluation of service quality before purchase more difficult than a corresponding evaluation of quality of a good that can be considered as a search product. Hence, purchase of services could be perceived as higher risk than purchase of goods of the same price (Mitchell, 1999; Mitchell & Greatorox, 1993). When considering a purchase, tangible search product features represent intrinsic cues for product evaluation; however, when considering a service (i.e., an experience product), such tangible features are not present. As such, the social cue becomes more important. Trying to reduce pre-choice uncertainty, consumers may seek information from others who have experienced the service (Murray, 1991). Hence, when facing a daily deal and consumers have to decide whether to buy, the number of deals purchased as a signal about other consumers’ behaviors will play a more important role when the target purchase is a service (i.e., an experience product) than a good (i.e., a search product). Therefore, we hypothesize an interaction effect:

H2. The effect of the number of deals purchased on perceived deal attractiveness is stronger for service offers than it is for offers of goods.

3.2.2. Familiarity

In evaluating a deal, consumers first resort to what they already know. Consumers’ prior product experiences lead to increased knowledge, which in turn influences cue utilization, such that, as familiarity increases, the reliance on extrinsic cues weakens (Rao & Monroe, 1988). Consumers with prior experience have a greater preference for using internal information sources, while those with no experience tend to rely to a greater degree on external sources (Murray, 1991). Research showed that individual differences, including familiarity with the product, influence the use of cues in product evaluation (Lee & Lou, 1995). Thus, people familiar with the product/service provider should be less likely to rely on the number of deals purchased as an external cue of deal attractiveness. While this relationship has been suggested as an important venue for future research (Coulter & Roggeveen, 2012), no empirical research has investigated it to date.

H3. The effect of the number of deals purchased on perceived deal attractiveness is stronger for customers unfamiliar with the provider than those familiar with the provider.

3.2.3. Discount size

Daily deal offers appeal to consumers primarily due to their large discounts. Price discounts enhance perceived value and increase purchase intention (e.g., Grewal, Monroe & Krishnan, 1998). Further, discount size influences consumers’ price perceptions and deal evaluations (Alba, Mela, Shimp & Urbany, 1999). Larger discounts are typically more attractive, although the effect is not linear (Gupta & Cooper, 1992; Kukar-Kinney & Carlson, 2015; Xia & Monroe, 2009).

Both discount size and number of deals purchased may enhance the perceived attractiveness of the discounted offer. Consistent with cue utilization theory, when both intrinsic and extrinsic cues are available, consumers will first resort to intrinsic cues, followed by extrinsic cues (Miyazaki, Grewal, & Goodstein, 2005). Specifically, when intrinsic cues are diagnostic, i.e., provide abundant information to evaluate deal attractiveness, extrinsic cues are less important (Aldeniz, Calantone, & Voorhees, 2013). Further, the more diagnostic the cue is, the more likely it will be relied upon (Dick, Chakravarti & Biehal, 1990). This research proposes that in the daily deal context, consumer’s primary focus is on buying a deal (and only secondarily on a specific product). Discount size is the integral feature of the deal and should as such represent a key intrinsic feature of the daily deal. Therefore, when a discount is large, it should be sufficiently diagnostic of deal attractiveness, and the number of deals purchased as an extrinsic cue should have less influence. However, when the discount is relatively low, it is not sufficiently diagnostic of deal attractiveness on its own, the number of deals purchased should become more informative, providing additional information to assess deal attractiveness. Hence, we predict that the number of deals purchased will interact with discount size when affecting the perceived attractiveness of the deal.

H4. The effect of the number of deals purchased on perceived deal attractiveness is stronger when discount size is lower than when it is higher.

4. Methodology

Four studies were conducted to test the conceptual model. Study 1 establishes the base model and confirms the main effect of the number of deals purchased on perceived deal popularity, attractiveness, and purchase consideration. It also examines inter-relationships among these constructs (H1a–H1c) in an experimental context. Studies 2–4 test the proposed moderating effects (H2–H4). Fig. 1 displays the proposed conceptual model and Table 1 provides an overview of the experimental studies and manipulations.
4.1. Study 1

4.1.1. Sample
Two-hundred-and-twenty-five respondents from an online subject pool available through Amazon Mechanical Turk participated in the study. The sample consisted of 48% males, median age was 25–34 years, 90% shopped at daily deal websites at least once per month, and average familiarity with daily deal websites was 6.36 (out of 7).

4.1.2. Experimental design
An online scenario-based experiment was developed to test the conceptual model. The respondents were asked to imagine that they encountered a deal for a local restaurant while browsing an online daily deal website. The deal allowed them to purchase a voucher for $30 worth of food and non-alcoholic drinks for $15 (50% discount, a typical discount for a restaurant in online daily deals). In addition, respondents were told how many deals had already been purchased. The number of deals purchased was manipulated as very low (17), low (57), medium (117), high (517), or very high (1017). In the control condition, the number of deals purchased was not included in the description. Respondents were randomly assigned to a condition. After seeing the details of the deal, they were asked to evaluate the deal, respond to manipulation checks and provide general purchase behavior and demographic information.

4.1.3. Measures
Perceived deal popularity was measured with three seven-point semantic differential scales (unpopular – popular; not selling well – selling well; not in high demand – in high demand; Cronbach alpha = 0.97, Mean = 4.97, SD = 1.70) (van Herpen, Pieters & Zeelenberg, 2009). Perceived deal attractiveness was measured with three items (unattractive to me – attractive to me; undesirable to me – desirable to me; worthless to me – valuable to me) (van Herpen, Pieters, & Zeelenberg, 2009) (Cronbach alpha = 0.96, Mean = 5.39, SD = 1.40). Purchase intention items were based on Grewal, Monroe, and Krishnan (1998) and Dodds, Monroe and Grewal (1991): “The probability that I would consider buying this deal is…”, “The likelihood that I would consider purchasing this deal is…”, and “My willingness to consider buying this deal is…”. The responses were anchored at 1 = very low and 7 = very high (Cronbach alpha = 0.97, Mean = 5.16, SD = 1.35).

The confirmatory factor model exhibited a good fit with the data (chi-square = 45, df = 24, p < 0.01; NFI [Normed Fit Index] = 0.99, CFI [Confirmatory Fit Index] = 0.99, RMSEA [Root Mean Squared Error of Approximation] = 0.06). All standardized factor loadings were at or above 0.88, indicating sufficient item reliability and validity. The average shared variances were 0.91 for deal popularity, 0.88 for deal attractiveness, and 0.91 for purchase intention, all exceeding squared inter-correlations for all pairs of constructs, providing evidence of discriminant validity (Fornell & Larcker, 1981). Due to the high correlation between deal attractiveness and purchase intention we further tested for discriminant validity by comparing the confirmatory factor model in which both deal attractiveness and purchase intention items were forced to load onto the same underlying factor. The model fit of the second model was significantly worse (chi-square = 327, df = 26, p < 0.01), as indicated by the chi-square difference test ($\Delta \chi^2 = 282, \Delta df = 2$, p < 0.01), confirming that the two constructs are distinct.

Construct measures performed similarly in studies 2–4, displaying good psychometric properties including item and construct reliability.
Table 2

<table>
<thead>
<tr>
<th>Standardized factor loadings.</th>
<th>Study 1</th>
<th>Study 2</th>
<th>Study 3</th>
<th>Study 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deal popularity</td>
<td>0.94</td>
<td>0.95</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>Unpopular – popular</td>
<td>0.98</td>
<td>0.99</td>
<td>0.99</td>
<td>0.98</td>
</tr>
<tr>
<td>Not selling well – selling well</td>
<td>0.94</td>
<td>0.97</td>
<td>0.94</td>
<td>0.97</td>
</tr>
<tr>
<td>Not in high demand – in high demand</td>
<td>0.97</td>
<td>0.98</td>
<td>0.97</td>
<td>0.97</td>
</tr>
<tr>
<td>Deal attractiveness</td>
<td>0.97</td>
<td>0.99</td>
<td>0.91</td>
<td>0.98</td>
</tr>
<tr>
<td>Unattractive to me – attractive to me</td>
<td>0.97</td>
<td>0.98</td>
<td>0.97</td>
<td>0.98</td>
</tr>
<tr>
<td>Undesirable to me – desirable to me</td>
<td>0.88</td>
<td>0.90</td>
<td>0.85</td>
<td>0.90</td>
</tr>
<tr>
<td>Worthless to me – valuable to me</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>Purchase intention</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>The probability that I would consider buying this deal is low – high</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>The likelihood that I would consider purchasing this deal is low – high</td>
<td>0.96</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>My willingness to consider buying this deal is low – high</td>
<td>0.94</td>
<td>0.94</td>
<td>0.94</td>
<td>0.95</td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Psychometric scale characteristics.</th>
<th>Study 1</th>
<th>Study 2</th>
<th>Study 3</th>
<th>Study 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach α</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>Deal popularity</td>
<td>0.96</td>
<td>0.97</td>
<td>0.93</td>
<td>0.97</td>
</tr>
<tr>
<td>Deal attractiveness</td>
<td>0.97</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>Average variance extracted (AVE)</td>
<td>0.91</td>
<td>0.94</td>
<td>0.94</td>
<td>0.95</td>
</tr>
<tr>
<td>Deal popularity</td>
<td>0.88</td>
<td>0.92</td>
<td>0.83</td>
<td>0.91</td>
</tr>
<tr>
<td>Deal attractiveness</td>
<td>0.91</td>
<td>0.93</td>
<td>0.93</td>
<td>0.94</td>
</tr>
<tr>
<td>Inter-construct correlations</td>
<td>0.56</td>
<td>0.49</td>
<td>0.43</td>
<td>0.44</td>
</tr>
<tr>
<td>Deal popularity ↔ deal attractiveness</td>
<td>0.42</td>
<td>0.49</td>
<td>0.40</td>
<td>0.44</td>
</tr>
<tr>
<td>Deal popularity ↔ purchase intent</td>
<td>0.87</td>
<td>0.90</td>
<td>0.81</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Table 4a

<table>
<thead>
<tr>
<th>Cell sizes in study 1.</th>
<th>Study 1</th>
<th>Study 2</th>
<th>Study 3</th>
<th>Study 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of deals</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Control</td>
<td>32</td>
<td>14.2</td>
<td>36</td>
<td>16.0</td>
</tr>
<tr>
<td>Very low (17)</td>
<td>36</td>
<td>16.0</td>
<td>39</td>
<td>17.0</td>
</tr>
<tr>
<td>Low (57)</td>
<td>47</td>
<td>20.9</td>
<td>47</td>
<td>20.9</td>
</tr>
<tr>
<td>Medium (117)</td>
<td>46</td>
<td>20.4</td>
<td>47</td>
<td>20.9</td>
</tr>
<tr>
<td>High (517)</td>
<td>32</td>
<td>14.2</td>
<td>34</td>
<td>14.6</td>
</tr>
<tr>
<td>Very high (1017)</td>
<td>32</td>
<td>14.2</td>
<td>34</td>
<td>14.6</td>
</tr>
<tr>
<td>Total</td>
<td>225</td>
<td>100</td>
<td>222</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4b

<table>
<thead>
<tr>
<th>Cell sizes in studies 2–4.</th>
<th>Study 2</th>
<th>Study 3</th>
<th>Study 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of deals</td>
<td>Freq.</td>
<td>Freq.</td>
<td>Freq.</td>
</tr>
<tr>
<td>Product type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provider familiarity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discount size</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Product</td>
<td>33</td>
<td>39</td>
</tr>
<tr>
<td>Service</td>
<td>30</td>
<td>High</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>Total</td>
<td>71</td>
</tr>
<tr>
<td>High</td>
<td>Product</td>
<td>30</td>
<td>39</td>
</tr>
<tr>
<td>Service</td>
<td>29</td>
<td>High</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>Total</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>Total</td>
<td>78</td>
</tr>
<tr>
<td>Service</td>
<td>59</td>
<td>High</td>
<td>63</td>
</tr>
<tr>
<td>Total</td>
<td>122</td>
<td>Total</td>
<td>141</td>
</tr>
</tbody>
</table>

and validity, including discriminant validity. Table 2 shows standardized factor loadings and Table 3 provides a comparison of psychometric properties of the scales across all studies. Tables 4a and 4b list the cell sizes for each condition in all studies.

4.1.4. Analysis

To check whether the manipulation was successful, consumers’ perceptions of number of deals purchased were measured by participants’ response to the statement “The number of deals already sold was high”. ANOVA analysis showed a significant effect ($F_{(1, 219)} = 35.27$, $p < 0.01$). To determine whether significant differences existed between the successive levels, a contrast analysis was conducted. The results indicate that the means of the first four experimental conditions ($\text{Mean}_{\text{very low}} = 2.50$, $\text{Mean}_{\text{low}} = 4.21$, $\text{Mean}_{\text{medium}} = 5.11$, $\text{Mean}_{\text{high}} = 6.06$) were all significantly different from each other (all t-values > 2.67, all p-values < 0.01); however, the mean of the very high group ($\text{Mean}_{\text{very high}} = 6.09$) did not significantly differ from the mean of the high experimental group ($\text{Mean}_{\text{high}} = 6.06$; t(62) = 0.12, $p > 0.10$). Thus, the number of deals effect seemed to plateau when the actual number of deals purchased reached about 500. As such, the very high level was removed from further analysis.

The base conceptual model was tested next using structural equation modeling in Mplus. The number of deals manipulation played the role of the observed independent variable with four ordinal levels (very low - 17, low - 57, medium - 117, high - 517). The model fit the data well (chi-square = 47.18, df = 33, $p > 0.05$, TLI = 0.99, CFI = 0.99, RMSEA = 0.05).

The study predicted that a large (vs. small) number of deals purchased by others will increase perceived deal popularity. This expectation is supported ($\beta = 0.57$, $p < 0.01$). Further, deal attractiveness increased with increases in perceived deal popularity ($\beta = 0.62$, $p < 0.01$). Deal attractiveness in turn positively influenced purchase intentions ($\beta = 0.87$, $p < 0.01$). Finally, bootstrap mediation analysis (Hayes, 2013; Zhao, Lynch & Chen, 2010) confirmed perceived deal popularity as a significant mediator ($\beta = 0.54$, 95% CI = [0.45, 0.63]). Overall, the results support H1a–H1c.

4.1.5. Discussion

The findings from Study 1 confirm that the number of daily deals purchased positively influences perceived deal attractiveness and that the effect is mediated through perceived deal popularity. Attractiveness of the deal further increases purchase intention. The remaining studies focus on establishing conditions under which number of deals purchased affects perceived deal attractiveness by exploring the role of proposed moderating variables.

4.2. Study 2

4.2.1. Design and procedure

Study 2 was a 2 (number of deals purchased: low [17] versus high [517]) × 2 (goods versus services) between-subject design, investigating the moderating role of goods (i.e., search products) versus services (i.e., experience products). Goods/services manipulation involved a daily deal for either a hair dryer (goods) or a haircut and style (service). The two categories were chosen as they provide a similar benefit. One-hundred-and-twenty-two participants (67% males, median age 25–34 years, average familiarity with daily deal websites 6.01) were recruited through Mechanical Turk. Respondents were asked to imagine they encountered a deal for either a hair dryer from a local store or for a haircut and style from a local hair salon while shopping on a daily deal website. In both cases, the deal price was $15 and the value of the goods/service was $30. Familiarity with the store/salon was held constant by not specifying the name of either.

4.2.2. Analysis

MANOVA results indicated a significant main effect of number of deals purchased on deal popularity ($F_{(1, 118)} = 48.81$, $p < 0.01$), but not on deal attractiveness. More importantly, and as predicted, the interaction between number of deals purchased and the purchase context on perceived deal attractiveness was significant ($F_{(1, 118)} = 4.72$, $p < 0.05$). As predicted in H2, in the service purchase context, a large
number of deals purchased led to higher perceived deal attractiveness than a low number of deals (MeanLow # of deals = 3.81, MeanHigh # of deals = 4.79, t(57) = 2.19, p < 0.05). The effect in the goods (i.e., hair dryer) purchase context (MeanLow # of deals = 4.53, MeanHigh # of deals = 4.10, t(61) = 0.92, p > 0.10) was not significant.

While not the focus of investigation, MANOVA also showed a marginally significant number of deals × product type interaction on purchase intentions (F(1, 118) = 3.37, p = 0.07). A follow-up contrast analysis indicates that the pattern of the effects was consistent with those on deal attractiveness: in the service purchase context, a large number of deals purchased led to higher purchase intention than a low number of deals (MeanLow # of deals = 3.48, MeanHigh # of deals = 4.60, t(57) = −2.50, p < 0.05). No such effect was present in the goods (i.e., hair dryer) purchase context (MeanLow # of deals = 4.19, MeanHigh # of deals = 4.06, t(61) = 0.92, p > 0.10).

4.2.3. Discussion

The findings from Study 2 highlight the importance that the number of deals purchased by others plays in determining consumers’ response to promotional deals in service contexts relative to goods. Results support our argument that the number of deals purchased serves as an extrinsic cue to enhance deal attractiveness when other cues are not sufficient for deal evaluation. Consistent with this explanation, respondents more strongly agreed that it was difficult to evaluate the quality of haircut/style service than the hairdryer quality when shopping online daily deals (Meanhaircut/style = 4.80, Meanhairdryer = 3.52, t(121) = 6.25, p < 0.01).

Since the number of deals purchased cue is given more weight in consumers’ deal evaluation when consumers lack confidence in their evaluation of quality, familiarity with the service provider should reduce their reliance on this extrinsic social cue. Study 3 was conducted to test this hypothesis.

4.3. Study 3

4.3.1. Design and procedure

Study 3 was a 2 (number of deals purchased: low [17] versus high [517]) × 2 (familiarity with the provider: low versus high) between-subjects design. One-hundred-and-fifty-one Mechanical Turk workers participated (48% males, median age 25–34 years, average familiarity with daily deal sites 6.18). The respondents imagined they encountered an online daily deal for a local restaurant. In the low discount condition, the deal allowed them to purchase a voucher for $30 worth of food and non-alcoholic beverages for $25 (17% discount). In the high discount condition, they could purchase the $30 voucher for $15 (50% discount). Research shows that the effect of external information sources tends to vary with consumers’ individual characteristics (Chen, Teng, Yu & Yu, 2016). Hence, individual characteristics may also influence cue utilization. We therefore measured sale proneness (Lichtenstein, Ridgway & Netemeyer, 1993), a relevant personal characteristic in this sale-focused context. The items were: “If a product is on sale, that can be a reason for me to buy it”, “One should try to buy the brand that is on sale”, “I am more likely to buy brands that are on sale”, and “I have favorite brands, but most of the time I buy the brand that is on sale” (Cronbach alpha = 0.78, Mean = 4.74, SD = 1.25).

4.3.2. Analysis

Subjects in the low familiarity condition rated their familiarity with the restaurant as significantly lower than subjects in the high familiarity condition (Meanlow familiarity = 2.10, Meanhigh familiarity = 5.75, t(139) = 14.20, p < 0.01), as expected.

MANOVA analysis showed a significant main effect of number of deals purchased on perceived deal popularity (F(1, 127) = 92.21, p < 0.01) and attractiveness (F(1, 127) = 4.93, p < 0.05). In addition, familiarity with the provider had a significant main effect on perceived deal attractiveness and purchase intentions (Fs > 7, p < 0.01). Further, the interaction between number of deals and familiarity on deal attractiveness was significant (F(1, 127) = 4.30, p < 0.05). Specifically, for an unfamiliar restaurant, an increase in number of deals purchased led to an increase in perceived deal attractiveness (MeanLow # of deals = 4.34, MeanHigh # of deals = 5.34, t(76) = −3.66, p < 0.01). No such effect was present for a familiar restaurant (MeanLow # of deals = 5.77, MeanHigh # of deals = 5.78, t(61) = −0.04, p > 0.10). Thus, H3 was supported.

4.3.3. Discussion

Study 3 findings support the moderating role of customer familiarity with the service provider. Consumers who are inexperienced with the provider lack sufficient intrinsic information to evaluate the service, and are therefore more motivated to utilize additional cues, such as social cues, to evaluate the deal and make the purchase decision. Number of deals purchased serves as one such cue.

4.4. Study 4

4.4.1. Experimental design

Study 4 explores the moderating role of discount size on the effect of number of deals purchased. Study 4 was a 2 (number of deals purchased: low [17] versus high [517]) × 2 (discount: low versus high) between-subjects design. One-hundred-and-fifty-eight Mechanical Turk workers participated (48% males, median age 25–34 years, average familiarity with online daily deal sites 6.18). The respondents imagined they encountered an online daily deal for a local restaurant. In the low discount condition, the deal allowed them to purchase a voucher for $30 worth of food and non-alcoholic beverages for $25 (17% discount). In the high discount condition, they could purchase the $30 voucher for $15 (50% discount). Research shows that the effect of external information sources tends to vary with consumers’ individual characteristics (Chen, Teng, Yu & Yu, 2016). Hence, individual characteristics may also influence cue utilization. We therefore measured sale proneness (Lichtenstein, Ridgway & Netemeyer, 1993), a relevant personal characteristic in this sale-focused context. The items were: “If a product is on sale, that can be a reason for me to buy it”, “One should try to buy the brand that is on sale”, “I am more likely to buy brands that are on sale”, and “I have favorite brands, but most of the time I buy the brand that is on sale” (Cronbach alpha = 0.78, Mean = 4.74, SD = 1.25).

4.4.2. Analysis

MANOVA analysis with number of deals purchased and discount size as factors showed a significant main effect of number of deals on deal popularity and attractiveness and that of discount size on deal attractiveness (all Fs(1, 154) > 9, p < 0.01). However, the interaction between the two factors was not significant (F(1, 154) < 1, p > 0.10), hence H4 was not supported.

A possible explanation for the non-significant interaction is that different consumers may have different thresholds for attractive discount sizes. Therefore, we next added sale proneness, a consumer personal characteristic, as a third factor (using median split to classify the respondents into low and high sale proneness groups) into the analysis. Results showed a significant two-way discount size × sale proneness interaction (F(1, 150) = 5.55, p < 0.05) as well as a significant three-way discount size × number of deals purchased × sale proneness interaction on perceived deal attractiveness (F(1, 150) = 8.33, p < 0.01).

To determine the nature of this three-way interaction, two two-way ANOVAs were conducted, separately for consumers with high and low sale proneness. For highly sale prone consumers (see also Fig. 2a), a two-way ANOVA confirmed an existence of a discount size × number of deals purchased interaction (F(1, 61) = 4.32, p < 0.05). Specifically, when discount was low, an increase in the number of deals purchased was associated with a significant increase in perceived deal attractiveness (Low discount: MeanLow # of deals = 2.55, MeanHigh # of deals = 4.35, t(32) = −3.13, p < 0.01). However, when the discount size was high, an increase in the number of deals purchased did not further increase perceived deal attractiveness (High discount: MeanLow # of deals = 5.44, MeanHigh # of deals = 5.72, t(39) = −0.61, p > 0.10), supporting the pattern hypothesized in H4.
4.4.3. Discussion

Findings indicate that discount size interacts with the number of deals purchased interaction (F(1, 69) = 4.03, p < 0.05). However, the nature of the interaction was different. Specifically, when discount size was high, the number of deals purchased did not significantly influence perceived deal attractiveness (Low discount: MeanLow # of deals = 4.04, MeanHigh # of deals = 3.87, t(35) = 0.29, p > 0.10). However, when the discount size was high, an increase in the number of deals purchased was associated with an increase in perceived deal attractiveness (High discount: MeanLow # of deals = 4.15, MeanHigh # of deals = 5.52, t(34) = −2.89, p < 0.01).

4.4.3.1. Extrinsic Cues

Extrinsic cues play an important role in influencing consumers’ quality perceptions and purchase intentions (Jacoby, Olson & Haddock, 1971; Richardson, Dick & Jain, 1994). While existing research mostly focuses on extrinsic cues provided by marketers or present in the shopping environment, most of the cues studied are nonsocial in nature. In the present research, number of deals purchased signals other consumers’ purchase behavior, therefore representing a unique social cue for investigation. The authors build upon the existing literature and provide additional contribution by clarifying the underlying mechanism of the effect through perceived deal attractiveness and deal popularity. Deal attractiveness and popularity are two different concepts originating from different sources. Number of deals purchased as a cue influences consumers’ individual evaluations of the deal (i.e., perceived deal attractiveness and purchase consideration) directly as well as indirectly through their social evaluation of the deal (i.e., perceived deal popularity). This social evaluation is unique to cues with social connotations. All studies support this mediation effect.

Most importantly, this research sheds light on conditions under which consumers utilize number of deals purchased, as an extrinsic cue, to derive deal evaluations, beyond those already studied (Coulter & Roggeveen, 2012). Specifically, the moderating roles of product type, familiarity with the provider, discount size and sale proneness are identified and confirmed. Examining simultaneous effects of various cues, this research confirms that number of deals purchased by others functions as a secondary cue. It has no effect on deal evaluation when other cues are sufficient in allowing consumers to infer deal attractiveness, but it boosts attractiveness when other cues are not present or are insufficient. In sum, this research contributes to the sufficiently diagnostic of deal attractiveness, they do not need to utilize extrinsic cues (i.e., number of deals) to assess deal attractiveness. A large discount that is typically offered at these websites is sufficient to attract them to the deal, so they are not affected by number of deals purchased by others. However, when discount is low and cannot boost the perceived deal attractiveness on its own, number of deals purchased becomes more informative, providing an additional cue of deal attractiveness. Results showed the expected interaction effect (see H4) for highly sale prone consumers.

However, low sale prone consumers are not intrinsically attracted to discounts. As such, a large discount alone is not sufficiently diagnostic of an attractive deal, hence the extrinsic cue of number of deals purchased by others provides a boost to deal attractiveness in conjunction with the intrinsic cue. This pattern is consistent with the effect of multiple consistent vs. inconsistent cues (Miyazaki et al., 2005). For low sale prone consumers, the number of deals purchased appears to be most effective in increasing consumers’ deal evaluation when it is consistent with the discount cue (i.e., both positive: a large number of deals purchased coupled with a large discount). However, when the two cues are inconsistent (i.e., a large number of deals coupled with a small discount or a small number of deals coupled with a high discount), consumers give more weight to the negative cue (Miyazaki et al., 2005), so the positive effect of the number of deals purchased is not present.

In sum, the number of deals purchased has no additional effect when perceived deal attractiveness can readily be inferred from other cues important to consumers (e.g., a large discount size for highly sale prone consumers) or when it is inconsistent with other cues (e.g., in case of a small discount for less sale prone consumers).

5. Overall discussion

5.1. Theoretical contributions

This research represents a conceptual and empirical inquiry into consumers’ response to a relatively new form of promotions, online daily deals. Results are consistent with existing research on cue-utilization, demonstrating that consumers are influenced by multiple cues and these cues do not function in a mere additive manner (Akdeniz et al., 2013). Extrinsic cues play an important role in influencing consumers’ quality perceptions and purchase intentions (Jacoby, Olson & Haddock, 1971; Richardson, Dick & Jain, 1994). While existing research mostly focuses on extrinsic cues provided by marketers or present in the shopping environment, most of the cues studied are nonsocial in nature. In the present research, number of deals purchased signals other consumers’ purchase behavior, therefore representing a unique social cue for investigation. The authors build upon the existing literature and provide additional contribution by clarifying the underlying mechanism of the effect through perceived deal attractiveness and deal popularity. Deal attractiveness and popularity are two different concepts originating from different sources. Number of deals purchased as a cue influences consumers’ individual evaluations of the deal (i.e., perceived deal attractiveness and purchase consideration) directly as well as indirectly through their social evaluation of the deal (i.e., perceived deal popularity). This social evaluation is unique to cues with social connotations. All studies support this mediation effect.

Specifically, highly sale prone consumers are intrinsically attracted to discounts (Lichtenstein, Ridgway, & Netemeyer, 1993) and have a relatively lower threshold for perceived deal attractiveness. Hence, consistent with cue utilization theory (Akdeniz et al., 2013; Dick et al., 1990; Miyazaki et al., 2005), when the discount size (an intrinsic cue) is
development and extension of literature on cue utilization, social influence, and consumers’ response to price promotions in an online daily deals context.

5.2. Managerial implications

The research offers a series of implications with regards to designing and promoting online daily deal promotions. In study 1, the authors tested several levels of number of deals purchased and identified a possible ceiling effect (at ~500), above which no further increase in consumers’ perceptions existed. This ceiling may vary across different products and purchase contexts, so the sellers should empirically determine where it is. When the number of deals purchased reaches this ceiling, the seller may consider changing the indicator from displaying the exact number of deals to a statement, such as “Over XXX deals sold”. An interesting venue for future research would be to determine the reason for the ceiling effect.

Furthermore, a very low number of deals purchased was perceived the most negatively, whereas an even modest increase substantially improved consumers’ response to the deal. As such, while number of deals purchased by others is still low, the sellers are advised not to list an exact number, but rather a broader range anchored at a higher number (e.g., less than XX). This suggestion is consistent with price promotion research, which shows that tensile claims with a range anchored at the maximum upper limit are most effective in enhancing perceptions (Biswas & Burton, 1993, 1994).

This research further suggests that the effectiveness of number of deals purchased indicator in driving perceived deal attractiveness depends on the nature of the purchase (a good vs. service), level of consumers’ familiarity with the deal provider, the deal discount size and consumers’ individual characteristics, such as level of sale proneness. Number of deals purchased may be an especially important indicator for services, but less so for goods (study 2). Thus, it is recommended that deal providers include an indication of the number of deals purchased in service deals descriptions. In addition, the number of deals indicator can be utilized to enhance perceived deal attractiveness when targeting new customers (study 3), who are not very familiar with the service provider and are in need of extrinsic cues to form an evaluation. Given that a key goal of daily deals is to increase first-time purchases by decreasing financial purchase risk, providers could emphasize the social cue (e.g., XXX people have bought) to help overcome the perceived risk of purchase. Specifically, number of deals indicator should be displayed for the consumers without a previous browsing and purchase history.

Finally, study 4 results suggest that the effect of discount size and sensitivity to this social cue depends on consumer individual characteristics. Specifically, a number of deals indicator can help retailers and service providers make highly discounted deals more attractive especially to the less sale prone consumer segment and hence expand their reach. At the same time, a number of deals purchased indicator can also make deals offering a low discount more attractive to the sale prone consumers, who represent a key target market for daily deal offers.

5.3. Limitations and future research

While this research sheds light on the conditions under which consumers are likely to utilize the social cue of number of deals purchased in deal evaluation, additional studies are warranted to extend the current research and add to the emerging understanding of consumers’ response to daily deal promotions. First, the actual number of deals perceived as low versus high may vary across different product or service categories and different price levels and should be further examined. It would be interesting to see whether extreme numbers (e.g., over 5000 deals sold) actually produce a negative effect as consumers may become concerned about the quality of the products or services sold. Second, a restaurant context was employed in all but study 2, due to 1) restaurant deals representing one of most frequent daily deals offered, 2) an established effect of social influence in this context (Zhang, Ye, Law & Li, 2010), and 3) the need to control for non-hypothesized context effects. Study 2 included a comparison of another experience product (hairstyling service) and a search product (goods: hairdryer). Yet other search, experience and credence services/goods purchase contexts should be explored in the future. Simultaneous interactive effects of multiple social and non-social cues could also be examined. As the sample was limited to Mechanical Turk participants with high familiarity of online daily deals, the nature of the sample may limit generalizability of the results to general consumer population. It would be interesting to further examine whether and how consumers who have had limited previous exposure to online daily deals respond to number of deals purchased as a cue.

In addition, while many deals aim at attracting new customers, some deals, especially repeated deals, attract both new and existing customers. How these customers react and whether they react differently to the number of deals indicator would be interesting to explore. For example, do new customers buy early or wait for many others to buy? Finally, the studies were scenario-based, with respondents reporting their perceptions and behavioral intentions. Even though participants were highly familiar with such daily deal websites, the magnitude of the obtained effects may vary from actual behavior. Future research should attempt to obtain customer-level data about actual purchase behavior on daily deal websites and perhaps combine them with survey data. A field experiment could also be used to assess the generalizability of findings.

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