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Consumer attention to price in social commerce: Eye tracking patterns in retail clothing[☆]

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ABSTRACT

Although the literature establishes the importance of pricing in relation to traditional retailers and e-commerce, few studies consider its importance in social commerce. This study uses eye tracking to examine observational behavior as fixation time on price and the total fixation time on a Facebook page that displays clothing products. This study employs interventions both directly related (via different prices of clothes and price visibility) and indirectly related (via human models vs. mannequins) to the price label. Results show a U-shape function for fixations on price and total fixations on a page with respect to price for females who buy for themselves and males who buy for their partners. This finding points not only to the utilitarian position of price, but also to its informational role. This study introduces a conceptual framework for further research, focused on the mechanisms through which social commerce can lead to increased sales and profits.

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1. Introduction

Social commerce is a business activity—social media platforms such as Facebook, Twitter, Instagram, and Pinterest mediate this activity and allow people to participate in the marketing, selling, comparison, buying, and sharing of products and services (Zhang, Zhou, & Zimmermann, 2013). Currently, social media has the potential to bring direct economic value to retailers as a result of transaction-based social commerce activities. For example, a Facebook storefront provides retailers with an additional outlet for promotion and sales opportunities and many retail-clothing companies have begun to exploit this channel to sell products (Kang & Johnson, 2015), which gives rise to “f-commerce.” F-commerce is a form of social commerce that by definition uses Facebook as a platform to facilitate and execute sales transactions (Kang & Johnson, 2015).

Although clothing retailers have adopted social media such as Facebook to a great extent as an extra promotional screen and even as a

sales platform, the clothing industry—in contrast with other sectors—has been slower to adopt online commerce in general (Sender, 2011). Consumers often characterize clothing as a “feel-and-touch product” that requires high sensory evaluation and/or trial to judge its quality (Kim & Kim, 2004), and for this reason, online clothing shopping environments are understandably less efficient than traditional retail stores in the provision of such opportunities to the consumer. Such limitations of online environments would increase the relative importance of those attributes attached to a product offer that are more perceptible to the consumers' eyes. Price, as one such attribute, attracts consumers to online stores and is among those attributes that ensures they return (Reibstein, 2002). However, with regard to the overall relationship between price and demand, the findings in the literature are not straightforward (e.g., Gijsbrechts, 1993; Somervuori, 2014). The economics and marketing literature widely acknowledges price to have attractive as well as aversive effects on demand (Gaur & Fisher, 2005; Rao, 2005; Rao & Monroe, 1988), and considers that price affects consumer choice both as a budget constraint and as a signal of subjective quality (Sigurdsson, Foxall, & Saevarsson, 2010; Zeithaml, 1988). Studies show that price has a negative effect on perceived value and willingness to buy (Dodds, Monroe, & Grewal, 1991). However, pricing can also increase both perceived effectiveness and the actual efficacy of products, as Shiv, Carmon, and Ariely (2005) demonstrate. This lack of consistency in the effects of price on consumer behavior warrants further empirical study in an online environment, especially as pricing becomes a more salient product attribute as customers cannot touch,

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feel, or try on different products (clothes in this research) online. The literature devotes insufficient attention to this aspect of social commerce practice.

Retailers that display items on social media platforms must have knowledge of pricing, combined with data on the consumer's visual attention to price, in particular. A consumer's brain relies on visual attention to process effectively the vast amount of information that a web promotional site presents. Neuroimaging studies, for instance, identify the units of visual information that an individual selects for attention (Kanwisher & Wojciulik, 2000). Several studies demonstrate a strong connection between visual attention and eye movements (for a review see Orquin & Loose, 2013). However, the existing research does not pay sufficient attention to the interaction effect between two different processes in visual attention, namely goal-driven and stimulus-driven attention (Orquin & Loose, 2013). For example, studies inadequately explore the impact of stimulus-driven factors such as saliency (display methods) and position on goal-driven variables like utility (price) from a social commerce perspective.

Although the literature establishes the importance of pricing in relation to traditional retailers and e-commerce (Fagerström & Ghinea, 2011), researchers do not sufficiently consider the issue of pricing within social commerce practice. This study aims to fill this gap through an examination of the effect of stimulus-driven factors on consumers' attention to goal-driven variables such as price in a social commerce setting, and uses an eye tracking methodology for this purpose. In line with Menon and Sigurdsson's (2015) study, which confirms the primacy of price for shoppers on Facebook, this study seeks to determine how direct (price-related variables) and indirect (display methods) interventions with price affects consumers' attention to price and total time on a page. Eye tracking methodology allows researchers to study the behavioral-environmental processes behind a purchase more effectively. Furthermore, this methodology provides real-time information on consumers' fixations and visualization patterns (Vila & Gomez, 2015). The present study adopts the approach of inductive reasoning in which researchers create and analyze large datasets from eye tracking data to identify patterns and then build a model to develop hypotheses in future studies. The structure of the paper is as follows. First, Section 2 reviews the relevant literature that considers attention to price at various price points, the effect of price visibility on attention to price, and finally, the effect of display methods on attention to price. Section 3 and Section 4 present the methodology and findings. Sections 5 and 6 conclude the paper with a discussion on academic and practical implications, the development of a conceptual framework, and directions for future research.

2. Theoretical background

2.1. The effect of price points on attention to price

Consumers base their purchase choice on what they learn from previous experiences (Monroe & Lee, 1999) and tend to gaze at information with greater importance to their choice (Orquin & Loose, 2013). Previous studies show that attributes with greater importance to the choice maker receive more fixations (Glöckner, Fiedler, Hochman, Ayal, & Hilbig, 2012; Meißner & Decker, 2010; Su, Rao, Li, Wang, & Li, 2012). Wagner (2007) suggests that many consumers who shop for apparel seem to look explicitly for low prices; however, in price-driven motivation, consumers seek reasonable prices, which need not be the lowest, comparatively, but which fall within a moderate range of prices. Wagner (2007) concludes that apparel shoppers appear to be price conscious and are attracted to retail prices that are not too high when compared with other market offers. Studies by Meißner and Decker (2010) and Sütterlin, Brunner, and Opwis (2008) also find that an attention-attribute importance relationship follows a U-shape curve, with more fixations on low and high importance attribute levels.

2.2. The effect of price visibility on attention to price

Research on attention to goal-driven stimuli such as price offers a crucial finding that task relevance is contingent on task demands (Orquin & Loose, 2013). Since task relevance is the primary driver of goal-driven attention (Navalpakkam & Itti, 2005; Sprague, Ballard, & Robinson, 2007), several studies investigate task-specific effects on attention (Glaholt, Wu, & Reingold, 2010; Glöckner et al., 2012; Toubia, de Jong, Stieger, & Füller, 2012) and their results show that people pay increased attention to goal-relevant stimuli. Hence, this study assumes that price visibility is a crucial factor that affects attention. Consumers generally tend to read from left to right and from top to bottom, which fact inspired several studies on position effects such as the list position effect (Chandon, Hutchinson, Bradlow, & Young, 2009; Shi, Wedel, & Pieters, 2013) and the central position effect (Chandon et al., 2009; Glaholt et al., 2010; Lohse, 1997; Shi et al., 2013).

2.3. The effect of model/mannequin presence on attention to price

Displays are a very important element of online clothing merchandising, as most of the time, either a model or a mannequin displays the clothes. Several previous studies investigate the impact of human images/celebrity endorsements on consumer behavior, both in offline (e.g. Felix & Borges, 2014, Silvera & Austad, 2004) and online (Chae & Lee, 2013; Cyr, Head, Larios, & Pan, 2009; Djamasbi, Siegel, & Tullis, 2010) environments. Importantly, these studies find that faces attract consumers' visual attention more than any other visual stimuli, or at the expense of other visual stimuli (Bindemann, Burton, Hooge, Jenkins, & de Haan, 2005; Cerf, Harel, Einhäuser, & Koch, 2008; Palermo & Rhodes, 2007). Though sparsely, some studies consider the effect of mannequins on shopping behavior (Fiore, Yah, & Yoh, 2000; Kerfoot, Davies, & Ward, 2003; Law, Wong, & Yip, 2012; Lindstrom, Berg, Nordfalt, Roggeveen, & Grewal, 2015; Oh & Petrie, 2012; Sen, Block, & Chandran, 2002). These studies show that the presence of a mannequin affects purchase intention and willingness to pay, store entry decision, and consumers' imagination in seeing themselves in the clothing displayed. However, few studies consider the effect of display methods (such as models and mannequins displayed on firms' social media sites), and consumers' attention patterns (in terms of first fixation and fixation time) that specifically focus on price in an online context.

3. Method

3.1. Participants, setting, and product

The study collaborated with a clothing retailer that uses a Facebook page as its primary shopping website through which consumers can order a product via phone or email. The products are trendy and fashionable and are not limited to clothes, although this study focused on clothes as they constitute the majority of the products available. The study used ladies' clothing displayed by the retailer on its Facebook page as the target product. The retailer provided the pictures of these dresses. The study selected participants randomly from a student population. The sample consisted of 34 European students (16 men and 18 women). The study measured participants' ages in five categories (<20, 21–30, 31–40, 41–50 and >50). One participant belonged to the <20 category, 18 belonged to the 21–30 category, 11 to the 31–40 category, three to the 41–50 category, and one belonged to the >50 category.

3.2. Design and procedure

At the onset of the study, an instruction slide asked the participants to go through a number of pictures on the Facebook page of the company under study. Each participant received a total of 25 pictures in different

combinations. The independent variables for the study were price points, position of price, and the presence of a known model or a mannequin. The dependent variables were the fixation time on price and the total fixation time on the page. The study used Tobii Studio 1.3 software and Tobii 1750 eye trackers to analyze the behavioral processes that occur when respondents selectively notice one aspect over the others.

4. Results

The eye tracking study excluded three participants due to incomplete information; data from the 31 other participants yielded a total of 775 data points. Fig. 1 shows a plot for the fixation length on price for males and females across different prices. The figure shows that the fixation length on price decreases as prices increase from ISK 5900 to ISK 11900 and then gradually increases with price, and reaches its highest point at ISK 15900. A statistically significant main effect exists for price points, $F(7, 728) = 5.65, p = 0.00$; however, the effect size is small (partial eta squared = 0.05). The interaction effect between gender and price is not statistically significant, $F(7, 728) = 0.93, p = 0.48$. Post-hoc comparisons through the Tukey HSD test indicate that the mean score for the price ISK 5900 ($M = 0.57, SD = 0.37$) and the price ISK 6900 ($M = 0.54, SD = 0.47$) are significantly different from that for the price ISK 11900 ($M = 0.33, SD = 0.34$). Similarly, the mean scores for both the price ISK 10900 ($M = 0.35, SD = 0.35$) and the price ISK 11900 ($M = 0.33, SD = 0.34$) are significantly different from those for the prices ISK 15900 ($M = 0.58, SD = 0.40$) and ISK 17900 ($M = 0.56, SD = 0.37$).

Fig. 2 shows a plot for the total fixation length on page across different prices for males and females. The figure shows clearly that the total fixation length on page decreases as prices increase from ISK 5900 to ISK 11900. The total fixation length then gradually increases as prices increase and reaches its highest point at ISK 17900. A statistically significant main effect exists for price points, $F(7, 728) = 9.11, p = 0.00$; however, the effect size is medium (partial eta squared = 0.08). The interaction effect between gender and price is not statistically significant, $F(7, 728) = 1.14, p = 0.34$. Post-hoc comparisons with the Tukey HSD test indicate that the mean score for the price ISK 5900 ($M = 2.18, SD = 0.64$) are significantly different from that for the price ISK 11900 ($M = 1.69, SD = 0.55$). Similarly, the mean score for the price ISK 11900 ($M = 1.69, SD = 0.55$) is significantly different from that for the prices ISK 13900 ($M = 2.04, SD = 0.65$) and ISK 17900 ($M = 2.42, SD = 0.78$). In addition, the mean score for the price ISK 12900 ($M = 1.89, SD = 0.63$) is significantly different from that for the price ISK 17900 ($M = 2.42, SD = 0.78$).

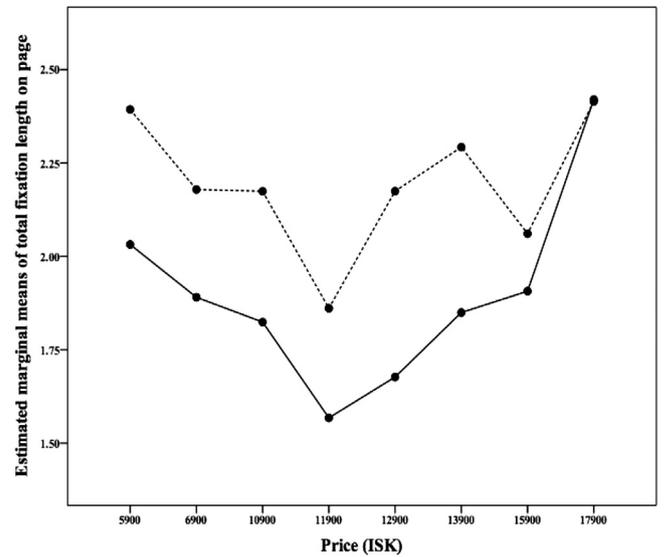


Fig. 2. Total fixation length on page across different prices; the solid line represents female participants and the dotted line, male participants.

Fig. 3 shows, for males and females, the mean total fixation time on the page and the mean fixation time on price for different price visibility. The study conducts independent samples *t*-tests to compare the mean scores of fixation length on price and total fixation length on a page with respect to price visibility for males as well as females. The results for females show a significant difference in scores for prices placed along with the picture ($M = 0.62, SD = 0.37$) and for prices placed below company details ($M = 0.35, SD = 0.34$); $t(430) = 6.19, p = 0.00$, two-tailed). Further, Cohen's effect size value ($d = 0.6$) suggests moderate to high practical significance. Results for males show a significant difference in scores for prices placed along with the picture ($M = 0.76, SD = 0.38$) and for prices placed below company details ($M = 0.32, SD = 0.31$); $t(310) = 9.57, p = 0.00$, two-tailed). Cohen's effect size value ($d = 1.1$) suggests a very high practical significance.

With respect to total fixation length on a page, the results for females show no significant difference in scores for prices placed along with the picture ($M = 1.81, SD = 0.60$) and for prices placed below company

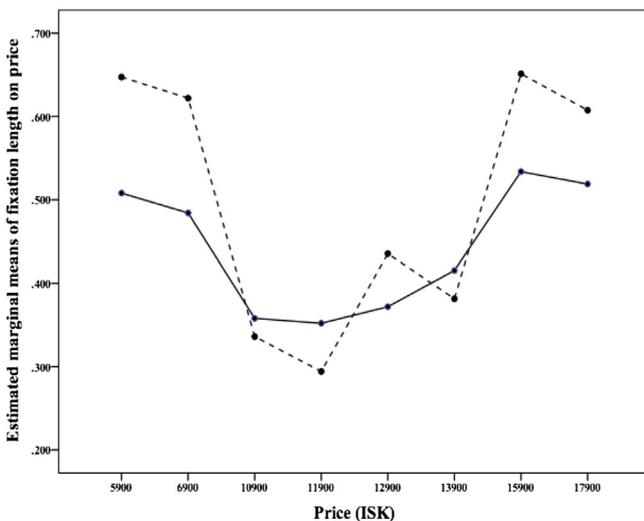


Fig. 1. Fixation length on price across different prices; the solid line represents female participants and the dotted line, male participants.

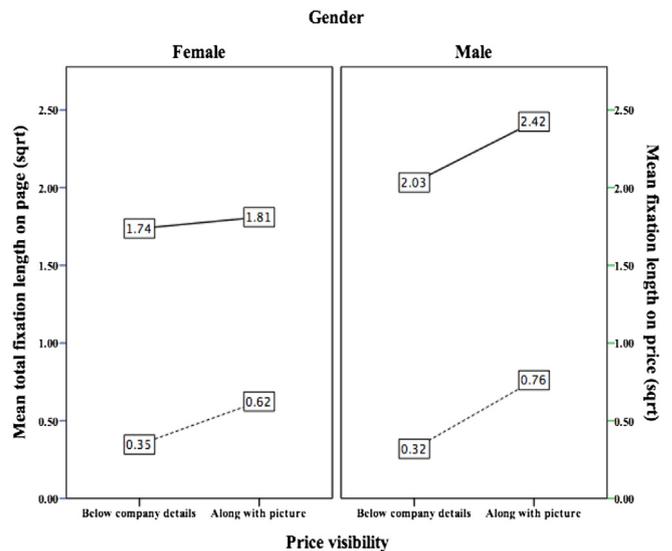


Fig. 3. Total fixation time and the fixation time on price with respect to price visibility for males and females. The solid line connects points that represent the mean total fixation length, and the dotted line connects points that represent the mean fixation length on price.

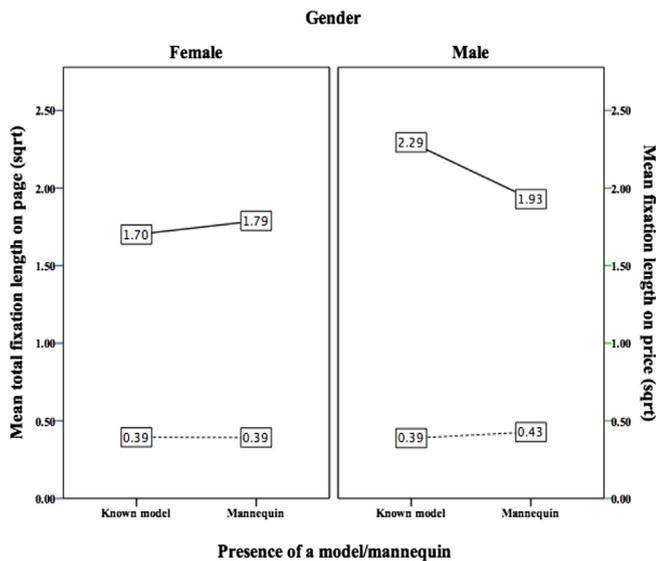


Fig. 4. Total fixation time and fixation on price for pictures with model and mannequin for males and females. The solid line connects points that represent the mean total fixation length, and the dotted line connects points that represent the mean fixation length on price.

details ($M = 1.74$, $SD = 0.65$); $t(430) = 0.89$, $p = 0.38$, two-tailed). However, the results for males show a significant difference in scores for prices placed along with the picture ($M = 2.42$, $SD = 0.50$) and for prices placed below company details ($M = 2.03$, $SD = 0.56$); $t(310) = 0.75$, $p = 0.00$, two-tailed). Cohen's effect size value ($d = 0.60$) suggests a moderate to high practical significance.

Fig. 4 provides mean total fixation time and mean fixation time on the price label for pictures with model and mannequin, respectively. The study conducts independent samples t -tests to compare the mean scores of fixation length on price and total fixation length on a page with respect to the presence of a model/mannequin for males as well as females.

With respect to fixation time on price, the results for females show no significant difference between the scores for the presence of a known model ($M = 0.39$, $SD = 0.38$) and for a mannequin ($M = 0.39$, $SD = 0.35$); $t(430) = 0.06$, $p = 0.95$, two-tailed). The results for males show no significant difference between the scores for the presence of a known model ($M = 0.39$, $SD = 0.35$) and for a mannequin ($M = 0.43$, $SD = 0.39$); $t(310) = -0.93$, $p = 0.35$, two-tailed). With respect to total fixation length on a page, the results for females show no significant difference between the scores for the presence of a known model ($M = 1.69$, $SD = 0.64$) and for a mannequin ($M = 1.79$, $SD = 0.64$); $t(448) = -1.61$, $p = 0.11$, two-tailed). The results for males, however, show a significant difference between the scores for the presence of a known model ($M = 2.29$, $SD = 0.49$) and for a mannequin ($M = 1.93$, $SD = 0.58$); $t(323) = 6.11$, $p = 0.00$, two-tailed). Cohen's effect size value ($d = 0.7$) suggests a moderate to high practical significance.

5. Discussion

This research investigates the attention of consumers to price of retail clothing in an f-commerce setting. The study incorporates various interventions such as different price points, price visibility, and the presence of a model vs. mannequin, to assess their impact on the attention to price through the use of an eye tracking device. The empirical results show a U-shape curve for males and females with low and high prices both significantly different from medium prices. The results also reveal that consumers have a fixation on price not only on the basis of the price itself, but also on the basis of stimulus-driven variables such as position (in this case price visibility) and saliency (model/mannequin).

Participants tend to gaze at information that has greater salience to their choice (Orquin & Loose, 2013). The U-shape curve this study obtains validates this statement and suggests that consumers fixate more on those prices that are relevant to their goal of dress purchase. However, a low fixation on price for the mid-range prices does not necessarily mean that the consumers did not consider them in their choice decisions (see Monroe & Lee, 1999). These results provide insights for retailers on the effect of different price points on consumer attention when they make a purchase in a social media environment. Future research could investigate the effect of different prices on variables such as recallable price knowledge, deal spotting, and even its effect on sales. Researchers need to investigate the ways in which the pricing issue differs between social commerce settings and general e-commerce, as well as differences among the various social commerce platforms (e.g., Facebook vs. Twitter).

This study explores the visibility of price through the placement of the price label on the left, along with the picture of a model/mannequin, and on the right, below the company details. Knowledge acquired from functional brain imaging studies seems to suggest that humans direct attention toward a specific spatial location. Therefore, the study expects that a price tag placed near or on the picture of the model/mannequin would receive a higher fixation length compared with a price tag placed in a spatial location further away from an object that draws visual attention. The findings confirm this expectation and show that for males as well as females, placement of this information on the left along with the picture rather than on the right below the company details results in significantly higher fixation on price. Thus, retailers can probably enhance the perception of a stimulus through placement near an attention "magnet," that is, the spatial location of an object that captures consumer attention. Further research could explore different price positioning effects in combination with different visual aspects.

Many studies consider the effect of saliency on attention (e.g. Lohse, 1997, Milosavljevic, Navalpakkam, Koch, & Rangel, 2012). This study focuses on images of models/mannequins as a salient attribute and studies the effect of their presence on the attention to price. The findings show no significant difference in the fixation on price when retailers display clothes on a model or on a mannequin. However, males have a higher total fixation length on a page that displays a model than on one that shows mannequins. The results imply that a picture of a model (with facial features) might represent a higher human condition on a Facebook page compared with a mannequin (without facial features), with a lesser representation of the human condition. Neuroimaging studies on visual attention on faces (Cerf et al., 2008; Kanwisher, McDermott, & Chun, 1997) and the attention bias study by Bindemann et al. (2005) also provide some explanation for this result.

The results also indicate that attention may be drawn to a particular attribute both directly—in this case by manipulating price and its position—and indirectly, by manipulating other salient variables on the site. Most clothing retailers focus on image-conscious consumers through displays that incorporate thin mannequins and slender models. Further research could explore the effect of model or mannequin picture size and its impact on fixation length, purchase intention, and sales.

6. Conclusion

Table 1 shows a summary of conclusions and suggestions for future research. The findings show that researchers can analyze consumers' needs in terms of attributes or stimuli with different consequences and then focus consumers' attention toward the main attributes both directly and indirectly. In addition to implications for retailers, the results of this study provide a useful theoretical contribution with respect to consumers' attention to price as they shop on social media platforms.

The results of this study imply that retailers can draw consumers' attention to price directly through manipulation of the price points and price position (visibility) or indirectly through the use of a salient attribute such as a model/mannequin. The study proposes a research

Table 1
Summary of conclusions and avenues for future research.

Study details	Findings	Future research
Effect of different price points on price fixation	U-shape curve for males as well as females with low and high prices both significantly different from medium prices	Investigate the impact of price points on variables such as purchase intention, perceived quality, recallable price knowledge, deal spotting, and sales. Test the impact of price on different social commerce platforms and for different industries. Examine price relative to the competitors.
Effect of price visibility (position) on price fixation	Males and females both have a significantly higher fixation on price when price is placed along with the picture than when placed on the right, along with company details and likes.	Explore different price positionings and their effects on price visibility.
Presence of model/mannequin and its impact on price fixation	Males and females both show no significant difference on fixation on price for the presence of a model or mannequin.	Investigate the impact of a model/mannequin with respect to other variables such as purchase intention and sales.

General suggestions for future research: Future studies could expand the sample size, utilize more representative groups, and incorporate more dependent variables such as fixation on likes, comments, and ads. These studies could also expand the number of firms and incorporate other social commerce platforms.

framework (see Fig. 5) to examine the determinants of consumer attention to price.

Through the use of this framework, further research could explore the effect of additional variables such as surface size, consumer comments, online advertisements, number of pictures of the item, or any other relevant variables on different social media platforms. Researchers should not limit the analysis itself to fixation length on price, but should explore other measurements such as time to first fixation, fixation count, and observation length. Several intermediary variables act upon consumers' attention to price. These include, but are not limited to gender, age, Internet usage, and Facebook usage. Further research could explore the interaction effect of these variables on attention to price. Attention to price is an important measure for retailers. Knowledge as to how consumers fixate on price can provide important insights for retailers with regard to the effectiveness of their pricing strategies, and even their marketing campaigns, through direct connections between consumer attention and sales. The framework only shows observational behavior with respect to attention on price. Future research could extend this through an analysis of fixation on additional areas of interest such as likes, comments, or advertisements.

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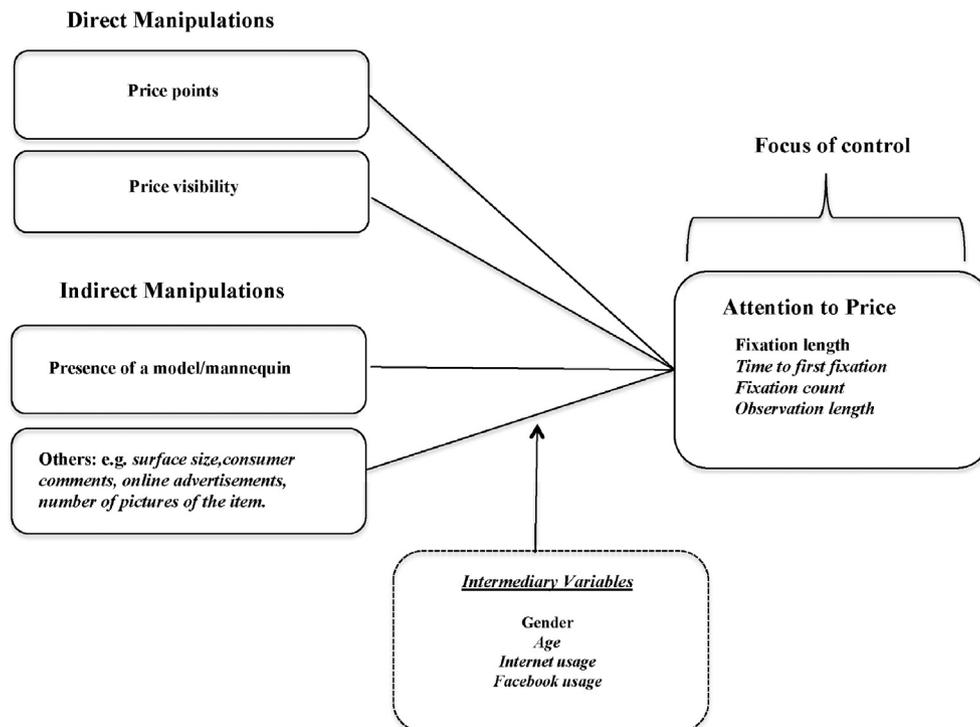


Fig. 5. The conceptual framework developed to analyze consumers' attention to price in social commerce. The text marked in italics shows the variables that this study has not tested, but which future research could use.

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