

# Does Social Media Marketing Really Work for Online SMEs?: An Empirical Study

Completed Research Paper

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## Abstract

*Social media has become a major channel for firms' marketing communications. Yet studies on the impact of social media marketing (SMM) have been limited to a few large firms. Motivated by the lack of understanding of the effectiveness of SMM for small and medium-sized enterprises (SMEs), this study investigates the impact of online SMEs' SMM messages on their sales performance through customer engagement. Fixed-effects regression analyses on weekly data from 288 online SMEs from the fashion retailing industry in China indicate that both customer endorsement and promotion information SMM messages positively influence customer engagement in the form of likes, shares, and comments. Additionally, customer engagement behaviors (likes and shares) lead to increased sales performance only if the SMEs verified their identity (a trust cue) with the social networking services and online e-commerce platform providers. Overall, the findings of this study highlight the crucial role of trust in SMEs' SMM activities.*

**Keywords:** Social media marketing (SMM), e-commerce, small and medium enterprise (SME), customer engagement, sales performance

## Introduction

Small and medium-sized enterprises (SMEs) are increasingly turning to social media to market their products. For instance, a LinkedIn survey reported that more than 90% of SMEs in the US are using or planning to use social media to seek marketing opportunities and attract new customers (Schneider 2014). Similarly, a Small Business Holiday study in 2015 noted that almost 70% of SMEs surveyed are using social media with the aim to acquire new customers and sell more to existing customers (Constant Contact 2015).

Yet, although small businesses have begun to use social media marketing (SMM), the majority of these businesses are uncertain about the value obtained from these media (Anderson 2015). They are unsure that social media has influenced their sales performance and also lack knowledge on ways to leverage SMM to engage with customers. Indeed, an eMarketer report noted that the majority of online small businesses have not seen an increase in sales that can be attributed to their SMM activities (eMarketer 2013).

Further, while large firms can invest significant amounts in paid forms of SMM<sup>1</sup>, SMEs are held back from using paid SMM (Luo 2015) due to their lack of resources. For example, a Gartner report highlighted that on average, large firms in the US and UK with more than \$500 million in annual revenues spent at least \$416,000 per month on SMM in 2014 (i.e., spending at least \$5 million per year; Pemberton 2015). On the other hand, most SMEs spent less than \$100 monthly on SMM in the same year (Delzio 2015). With a limited budget and knowledge about SMM, many SMEs conduct their SMM without a specific plan (Lawrence 2014) and are unable to put much effort into their SMM (Soderlund 2015).

Practitioners have suggested that SMEs should post SMM messages about their new products, discounts, and events i.e., promotion information (Longenecker et al. 2013; Roesler 2014) and re-post customer reviews about their products and services i.e., customers' endorsements (Jacobson 2009; Stecyk 2015). Particularly, customer endorsements may be important for online SMEs to establish their reputation, which is more challenging for small businesses than for large firms (Wang et al. 2004). Yet, little attention has been paid to assess the effects of these types of SMM messages on online SMEs' sales performance.

Even with these challenges, prior research on SMM has mainly focused on analyzing data from single, large, and well-established firms that have both online and offline stores (e.g., Kumar et al. 2016; Swani et al. 2013). Furthermore, these studies did not investigate the role of trust in SMM that is considered as an important factor in e-commerce (Gefen et al. 2003) and SMM (Sashi 2012), particularly for SMEs (Gligorijevic and Leong 2011; Wang et al. 2004). Additionally, previous research studying the effect of e-marketing budgets on sales performance of SMEs had been hampered by difficulties in obtaining objective sales performance data, since such data was not publicly available earlier (Eid and El-Gohary 2013).

Therefore, this study is motivated by a lack of understanding and empirical research about the effects of SMM messages on online SMEs' sales performance. Prior literature has suggested that customers' response by engaging with a firm's SMM messages is likely to positively impact the firm's sales performance (Rishika et al. 2012). Thus, this study seeks to address the following research question: *What is the impact of online SMEs' SMM messages on customer engagement and their sales performance?* Online SMEs using only SMM provide a suitable context to study this question, since they do not use other marketing channels and do not have offline stores that could confound the effects.

We address the research question by: (1) proposing a research model that explains the influence of two types of SMM messages (customer endorsements and promotion information) on social media related customer engagement (in the form of likes, shares, and comments) and subsequent sales performance of online SMEs, and (2) validating the model through crawling data of SMM messages, customer engagement, and sales performance from online SMEs' social media accounts and online stores respectively. The research model is grounded in the literature on SMM messages and customer engagement. The model was tested on a sample of 288 online SMEs from the competition-intensive fashion retail industry, which has a reported failure rate of 80% in the first five years (Wallace 2013). These businesses host their stores on the eBay-like Taobao, China's largest e-commerce website, and post SMM messages on Twitter-like Sina Weibo, a major microblogging service in China (Choudhury 2015; Groden 2016).

Our results from fixed-effects regression analyses on weekly data from the 288 SMEs indicate that both customer endorsement and promotion information SMM messages positively influence customer engagement in the form of likes, shares, and comments. In addition, customer engagement behaviors of likes and shares lead to increased sales performance only if the SME's identity is verified with the social networking services (i.e., Weibo) and online e-commerce platform (i.e., Taobao) providers.

By investigating the impact of online SMEs' SMM messages on customer engagement behaviors and sales performance, this study contributes to both theory and practice. In terms of research contributions, the findings add to the SME literature where there has been little study of the effects of e-marketing on sales performance. It not only uncovers the effects of different types of SMM messages on customer engagement and sales performance, but also indicates the vital role of identity verification as a trust cue in

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<sup>1</sup> Paid SMM refers to paid social media advertisements such as sponsored posts and sponsored pages. Firms pay social media sites for SMM messages or for their social media corporate pages to be advertised to consumers based on their specific characteristics including location, age, gender, and interests (e.g., Twitter's promoted tweets and Facebook's sponsored posts).

translating customer engagement into sales performance for online SMEs. The results also add to the SMM literature that has mainly focused on large firms and studied the impact of SMM messages on sales performance for single firms. This is remedied here by collecting and analyzing data from a large number of SMEs. In terms of practical implications, the findings particularly highlight the importance of customer endorsements and identity verification for SMEs' social media marketing. Specifically, verifying SMEs' identity with the social networking services and online e-commerce platforms, as well as diffusing their SMM messages through customers' likes and shares can increase online SMEs' sales performance.

## **Background and Hypotheses**

### ***Impacts of SMM Messages***

Social media marketing (SMM) is typically defined as a business entity's marketing communications through social media, such as Facebook (Erdoğan and Çiçek 2012; Hoffman and Fodor 2010). Because of its advantages over traditional marketing channels, such as allowing direct interactions with customers (Tuten 2008), obtaining real-time feedback (Andzulis et al. 2012), and gaining a large reach for diffusion of marketing communications (Kaplan and Haenlein 2011), firms (including SMEs) are increasingly employing SMM. Consequently, firms want to know whether their SMM efforts will impact their sales performance (Kumar et al. 2013; Kumar and Mirchandani 2012).

Prior studies have suggested that SMM messages can positively impact a firm's sales performance through customer engagement (Goh et al. 2013; Rishika et al. 2012). Customer engagement is defined as the reaction, response, or connection to the firm, which is often gauged through customers' response to the firm's marketing communications (Bijmolt et al. 2010). Customers' engagement with firms' SMM messages has been assessed through their liking, sharing, and entering comments on the SMM messages (Cvijikj and Michahelles 2013; de Vries et al. 2012).

While SMM has gained significant attention from practitioners, empirical studies on SMM message impacts are still scarce. The limited prior literature mainly attempts to investigate: 1) the impact of characteristics of SMM messages on customer behavior (e.g., customer engagement), and 2) the impact of SMM messages on firms' sales performance.

Within the first stream of research, de Vries et al. (2012) investigated which characteristics of firms' SMM messages posted on their brand fan pages influence customer engagement. Their study found that customers are more engaged (through the number of likes and comments) if there are more SMM messages that contain vivid (e.g., embedded video), and entertaining (e.g., fun and exciting) contents. Cvijikj and Michahelles (2013) extended de Vries et al. (2012)'s study by additionally investigating the effect of posting times of SMM messages on customer engagement behaviors for F&B firms' Facebook brand pages. Similar to de Vries et al. (2012), they found that posting more SMM messages with multimedia and entertaining contents can elicit greater engagement from customers. However, their result that posting more SMM messages with informative contents increases customer engagement, disagrees with de Vries et al. (2012) who did not find such an effect. In addition, they did not find significant results on the effect of the posting times of SMM messages. Lastly, Swani et al. (2013) assessed the impact of SMM messages on Facebook brand pages of Fortune 500 firms in the B2C and B2B contexts. Their analyses showed that posting more SMM messages with emotional contents (that was measured similar to entertaining contents in the earlier studies) can yield larger numbers of likes from customers regardless of the firm's business context. Overall, these studies showed mixed findings of the impacts of SMM message characteristics on customer engagement. Moreover, they were carried out on large firms that also use other marketing channels and have both offline and online presence, which could have confounded the results.

Within the second research stream, Rishika et al. (2012) studied how SMM messages on a firm's social media page affect customers' visit behaviors and profits using data from a single firm that sells wine and related products. They found that the number of SMM messages posted on the firm's social media page positively impacts customers' frequency of visiting the firm's stores as well as its profits. Goh et al. (2013) further investigated such effects by dividing SMM messages into firm-posted (i.e., marketer-generated contents) and customer-posted (i.e., user-generated contents) messages. Their study of a fashion retailer found that the information richness (i.e., the number of distinct information captured by text mining) of

customer-posted messages positively affects their spending on the firm's products. On the other hand, they reported that the information richness of firm-posted SMM messages does not affect customers' purchase expenditure. More recently, Kumar et al. (2016) investigated how a firm's SMM complements its other marketing channels (i.e., TV and e-mail advertisements). Similar to the earlier studies, they found that the number of firm-posted SMM messages positively affected customers' spending as well as their cross-buying behavior i.e., the number of distinct product categories bought. In addition, they found that the firm's SMM messages with promotion information interacted with the number of advertisements on other marketing channels to influence customer spending. However, this stream of studies mainly focused on data gathered from a single firm and did not explicitly test the mechanisms linking SMM messages and sales performance e.g., customer engagement.

While these prior studies, in general, found positive impacts of SMM messages on either customer engagement or sales performance, our review showed several gaps in the literature. First, while the prior literature suggests that *SMM messages increase customer engagement which in turn firms' sales performance*, this mechanism was not empirically formulated and tested. Previous research either tested the impacts of SMM message characteristics on customer engagement (Cvijikj and Michahelles 2013; Swani et al. 2013; de Vries et al. 2012) or the effects of posting SMM messages on firms' sales performance (Goh et al. 2013; Kumar et al. 2016; Rishika et al. 2012). Yet, investigating the mechanism linking SMM messages and sales performance is essential to deepen researchers' and practitioners' understanding of SMM impacts.

Second, both streams of studies did not assess the effects of reposting customer endorsements (testimonial and reviews from customers) in SMM messages, which can influence customer engagement and sales performance (Bowen 2013; Senecal and Nantel 2004). The first set of studies (Cvijikj and Michahelles 2013; Swani et al. 2013; de Vries et al. 2012) examined SMM messages posted by firms for advertising their products, services, and brand. The second set of studies, either focused only on SMM messages for promoting firms' products and services (Kumar et al. 2016) or did not distinguish promotion and endorsement SMM messages (Goh et al. 2013; Rishika et al. 2012). Thus, there is a lack of studies examining the effects of customer endorsement SMM messages while controlling for other message characteristics.

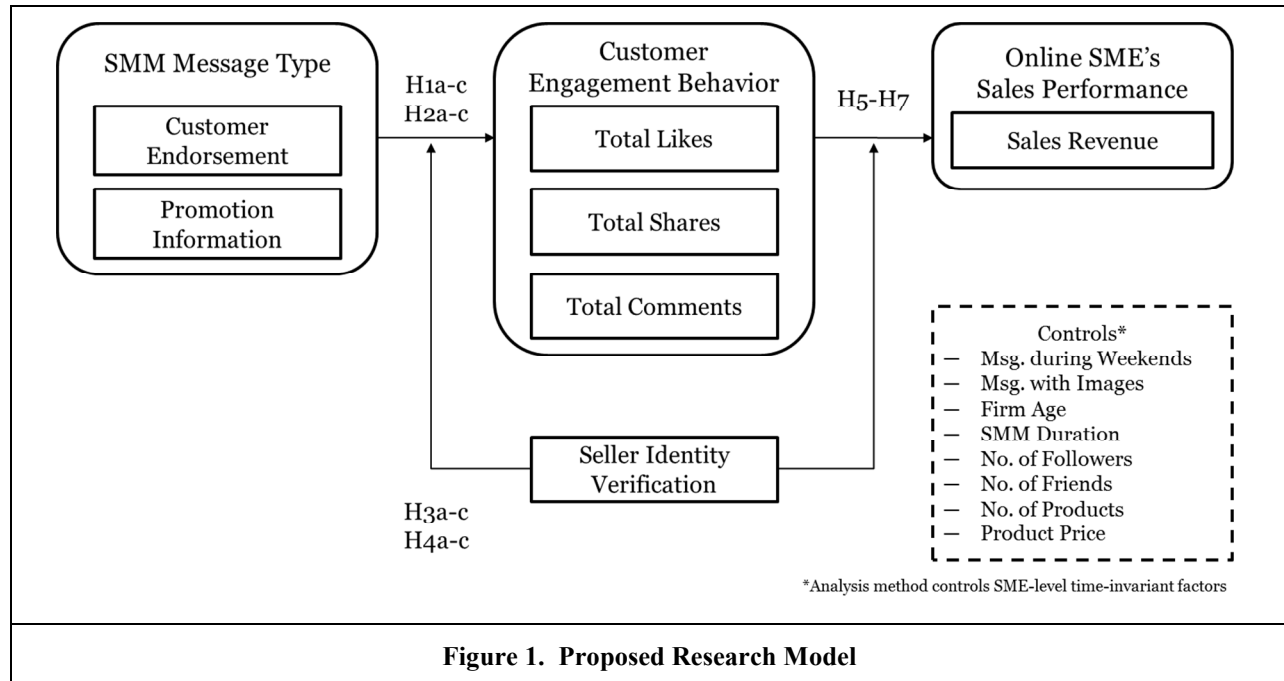
Third, the prior studies mainly focused on large firms that have both online and offline presences. Further, they did not consider the role of firm reputation and consumer trust in SMM effectiveness, which is potentially more important for SMEs (Gligorijevic and Leong 2011; Wang et al. 2004). In this study, we consider the effects of both customer endorsements in SMM messages and online SMEs' identity verification through social network services and e-commerce platforms, which should be vital for building customer trust and engagement with SMM leading to higher sales. In sum, the above gaps motivate us to develop and test our research model explaining the effects of two types of SMM messages (customer endorsements and promotion information) on sales performance of online SMEs through customer engagement.

## ***Hypotheses***

Deriving from prior literature which theorized linkages between SMM messages and customer engagement behaviors and/or sales performance (Kumar et al. 2016; de Vries et al. 2012) and the role of trust in the effectiveness of SMEs' SMM messages (Gligorijevic and Leong 2011; Wang et al. 2004), our research model proposes the following hypotheses: SMM messages (re-posts of customer endorsements and promotion information) posted by an online SME positively affect customers' engagement behaviors with the messages i.e., total likes, shares, and comments (H1-H2) both directly and positively moderated by seller identity verification i.e., if their store has been verified (H3-4). Further, we propose that customer engagement behaviors positively impact sales performance only with seller identity verification (H5-7). The unit of analysis is an online SME, while the time unit for longitudinal analysis is weekly. Our model is shown in Figure 1.

We hypothesize that two types of SMM messages can be effective for engaging customers with online SMEs: 1) promotion information messages i.e., their own information about their new products/services, and discounts/promotions of the products/services, and 2) customer endorsement messages i.e., SME's re-posts of customers' positive comments and reviews regarding their products and services. Further, we

consider three forms of customer engagement behavior i.e., pressing like and share buttons, and leaving comments on the SMM messages (Cvijikj and Michahelles 2013; de Vries et al. 2012).



Practitioners have suggested that publicizing customers' endorsements regarding their products, services, and brands can be an effective means for SMEs to attract and engage customers on social media services (Jacobson 2009; Stecyk 2015). This is because customers often engage with a firm's SMM messages in order to find reviews of the firm's products and services (Baird and Parasnis 2011). Similarly, researchers have suggested that customer endorsements can be an effective method for eliciting customer engagement behaviors (Athanasopoulos et al. 2001; Bowen 2013). Indeed, prior studies noted that customers often engage with online reviews written by other customers and respond to them, e.g., voting for the helpfulness of customer reviews on Amazon.com (Mudambi and Schuff 2010; Ngo-Ye and Sinha 2014). Building on this logic, customers will be more engaged (through likes, shares, and comments) if online SMEs post more customer endorsement SMM messages.

*H1a: Number of customer endorsement messages positively affects the total likes*

*H1b: Number of customer endorsement messages positively affects the total shares*

*H1c: Number of customer endorsement messages positively affects the total comments*

In addition, prior studies have suggested that firms' posting of SMM messages that contain information about their products and services can engage customers (Cvijikj and Michahelles 2013; Goh et al. 2013; Kumar et al. 2016), which is manifest through likes, shares, and/or comments. Practitioners have also suggested that SMEs can interact with and attract customers on social media by providing SMM messages with promotion information about their products and services that work as advertisements (Longenecker et al. 2013; Roesler 2014). Hence, we hypothesize,

*H2a: Number of promotion information messages positively affects the total likes*

*H2b: Number of promotion information messages positively affects the total shares*

*H2c: Number of promotion information messages positively affects the total comments*

This study further proposes that the effects of online SMEs' SMM messages on customers' engagement behaviors can be enhanced by providing seller identity verification (SIV), a cue of trust to customers. In the context of our study, SIV is defined as a specific type of logo that appears on SME's social media and online store accounts (Appendix A contains examples of SIV logos on Weibo and Taobao). It indicates that

the SME's "real identity" (usually the owner of SME's real-world identity) has been verified by the social media services and online store platform providers, offering cues similar to Twitter's verified accounts and eBay's ID Verify Program.

Trust has been suggested as one of the most crucial enablers in the e-commerce context because it helps customers to overcome potential issues and uncertainties, which is necessary for conducting transactions and interactions on e-commerce sites (McKnight et al. 2002). Prior studies have found that customers often seek cues that can help them assess the credibility and trustworthiness of a website to indicate quality and reduce potential privacy or security risks they may experience by accessing the website (Aiken and Boush 2006; Corritore et al. 2003). Researchers have also reported that these cues on a website can influence customers' perceptions of risk about the website and its contents, therefore affecting customers' intentions to interact with the website (Kim and Benbasat 2003; Vishwanath 2004). Further, Wang et al. (2004) suggested that this "cue-based trust" is crucial for SMEs because large and established firms can substitute the lack of cue-based trust with their reputation and awareness among the public, which SMEs would find challenging to do.

With the same logic, researchers have suggested that building trust between a firm and its customers is vital for e-commerce adoption (Gefen et al. 2003) and customer engagement via social media marketing activities (Sashi 2012). Online SMEs operating on social media services and e-commerce platforms (e.g., eBay and Taobao) can suffer from lack of trust towards their SMM messages and sales operations because it is relatively easy to create fake accounts on these services (Goldsborough 2003; Krombholz et al. 2012) and conduct malicious attacks, such as scam sales or identity theft, on individuals who interact with these accounts (Xiong and Liu 2003; Zhang et al. 2010).

Literature on social media and e-commerce suggests that the SIV mark appearing on a seller's account can work as a cue of credibility and trustworthiness to customers (Li and Liu 2007; Morris et al. 2012). Thus, customers may perceive that online stores with SIV are less likely to be involved in online frauds and scams. Hence, we propose that if a SME has its social media and online store accounts verified (SIV=1), customers are more likely to engage in response to its SMM message characteristics because SIV reduces their concerns about quality, privacy, and security as compared to no SIV. This should hold for both types of messages and the different forms of customer engagement behaviors.

*H3a: The positive effect of number of customer endorsement messages on the total likes is stronger when the online SME has seller identity verification than not*

*H3b: The positive effect of number of customer endorsement messages on the total shares is stronger when the online SME has seller identity verification than not*

*H3c: The positive effect of number of customer endorsement messages on the total comments is stronger when the online SME has seller identity verification than not*

*H4a: The positive effect of number of promotion information messages on the total likes is stronger when the online SME has seller identity verification than not*

*H4b: The positive effect of number of promotion information messages on the total shares is stronger when the online SME has seller identity verification than not*

*H4c: The positive effect of number of promotion information messages on the total comments is stronger when the online SME has seller identity verification than not*

Customers' engagement behaviors with a firm's SMM messages can affect the firm's sales performance in several ways. First, if a customer clicks a like/share button or leaves a comment on a firm's SMM message, most social media services (e.g., Facebook, Twitter, and Weibo) not only announce these engagement behaviors but also forward (at least an excerpt of) the SMM message to other customers who are connected (e.g., friends, followers) with this customer. In other words, SMM messages further diffuse to other customers via customers engaged with them. This diffusion of information among customers on social media services increases the chance of the SMM message reaching relevant customers, who are looking for the products and services that the SMM message informs, thereby positively contributing to the firm's sales performance (Berger and Milkman 2012).

Second, customers' comments on a firm's SMM messages often contain customer reviews (e.g., personal opinions and experiences) regarding the firm's products and services informed by the SMM messages.

These reviews in SMM messages can work as electronic Word-of-Mouth (eWOM; Jansen et al. 2009). Indeed, eWOM generated by online customer reviews can positively impact the sales of products and services mentioned in the reviews (Chevalier and Mayzlin 2006; Duan et al. 2008). This is because the reviews provide information that reduces customers' risk and uncertainty regarding the products and services (Chen and Xie 2008; Zhu and Zhang 2010), thereby facilitating customers' purchase behavior.

Finally, if they engage with a firm's SMM messages, customers are more likely to interact with the firm. Prior research found that customers who frequently interact with a firm's social media page build positive attitudes towards the firm and its products/services (Senecal and Nantel 2004; Wang 2005). These attitudes positively impact customers' brand usage intent (Hollebeek et al. 2014) and intention to purchase the firm's products (Hutter et al. 2013). In addition, Rapp et al. (2013) found that firms' and customers' social media use increased customer loyalty and firms' sales performance.

Further, we propose that the positive impacts of customer engagement behaviors on sales performance argued above would depend on online SME's identity verification. Although customer engagement behaviors could help diffuse SME's SMM messages and produce eWOM, they may not be enough for customers to transact with the SME. The potential quality, privacy, and security risks of online SMEs, such as fake accounts or fake products (Krombholz et al. 2012; Zhang et al. 2010), can deter purchase behavior. While customers' risk perceptions can be mitigated by their trust towards the SME (Teo and Liu 2007), establishing such trust itself is challenging because of their lack of reputation and small firm size (Wang et al. 2004). In this situation, prior research suggests that cues of credibility and trustworthiness will be effective (Kim and Benbasat 2003; Vishwanath 2004), which can be provided by seller identity verification. In other words, customer engagement behaviors are expected to positively impact sales performance when the online SME is verified with the social media and e-commerce platforms, but not otherwise.

*H5: Total likes positively affects sales performance when the online SME has seller identity verification*

*H6: Total shares positively affects sales performance when the online SME has seller identity verification*

*H7: Total comments positively affects sales performance when the online SME has seller identity verification*

## **Methodology**

### ***Data Collection***

Online SMEs selling fashion products that use only Sina Weibo (also called as "Weibo") for their marketing communications and Taobao for their business activities were chosen as the sample for our study. Weibo is one of the most popular social media in China (Fong 2012; Groden 2016) which offers features similar to Twitter (Gao et al. 2012). Users can write posts of up to 140-character and also attach additional contents such as pictures and external links of web pages to their posts. A user is connected to other users through a follower-followee network, and postings of people whom the user is currently following appear on the user's "timeline". This organizes postings by time (in a descending order) and updates occur on a real-time basis. Similar to Twitter, mention (@username) and hashtag (#text#) features are also available for supporting conversations and discussions among users. Taobao is China's largest online marketplace (Choudhury 2015; Larson 2014) which is often compared to eBay because they offer similar functions on their e-commerce platforms for SMEs (Li et al. 2008; Ou and Davison 2009). Sellers (e.g., SMEs) set up their "shop profile" page which can contain multiple product pages. The layouts of the shop profile and product pages are almost equivalent to that of eBay or Amazon.com, but allow more customizations for presenting seller and product information. For instance, a banner which includes the seller's information (contacts and customer ratings of the seller) can be placed at different locations of the seller's shop profile and product pages (e.g., topmost, top-right, or next to the product description). Similarly, the locations of some layouts of product pages (e.g., other products from the seller, related products recommended by Taobao) can also be customized.

Different from previous studies on large firms, this research setting allows us to control for potential: 1) location and reputation effects from offline stores, since these SMEs do not have an offline presence, 2)

advertisement effects from other marketing channels, because they only use Weibo for their marketing activities. In addition, the fashion retail industry was chosen since online apparel is one of the most popular and fastest-growing e-commerce category in the US (Global Biz Circle 2015) and elsewhere, including China (China Internet Watch 2014). Yet, despite the industry having an overall positive outlook and sustained inflow of new entrants, 80% of small fashion retailers cease operation within the first five years primarily due to poor marketing and intense competition (Wallace 2013). Thus, small fashion companies have a strong imperative to understand how to effectively leverage SMM to promote their products and increase their sales conversion rates (Millward 2012).

We focused on online SMEs, which refers to online firms with an annual sales revenue not exceeding CNY 200 million, as per the Chinese Ministry of Industry and Information Technology (2011)'s definition of SMEs. In addition, we verified that all the SMEs in our sample did not list alternative marketing platforms and only operated on Taobao, by using information from their Weibo and Taobao profiles.

Our initial sample of online SMEs was collected using keyword search and snowball sampling techniques, which are detailed next. First, we used four keyword sets i.e., "taobao fashion", "taobao store", "taobao new" and "taobao clothing" to find potential subjects using the search engine on Weibo. Second, the snowball sampling technique was employed wherein additional SMEs were identified by browsing through the follower and friend lists of the previously identified firms. Finally, the whole set of SMEs were screened by accessing their Taobao stores, which were specified on their Weibo accounts, so as to ensure that they only sold fashion products i.e., clothing, bags, footwear, and accessories.

Data collection was conducted on the last day of each week by web crawling the qualified SMEs': (1) Weibo account, and (2) Taobao account, for a 3-month period. Data collected from Weibo included each SME's Weibo account profile and SMM messages (with contents, timestamp, numbers of likes and shares) as well as customers' comments on the SMM messages. Further, each SME's Taobao store profile and sales volume/price of each product listed in their Taobao store were collected. Since the sales volume displayed for each product is a cumulative value, we took the difference between the sales volumes for the current and previous weeks so as to derive the actual weekly sales amounts. In the event that there was a new product (i.e., a product which had not been listed in any of the previous weeks), we used the sales volume figure collected for the current week as the weekly sales amount for that particular product in that week. The extracted SMM messages were filtered to retain only those messages related to the SME's store, because SMEs' Weibo accounts are often managed by their owners in which they also post messages unrelated to their stores, such as the restaurants they have visited.

After removing SMEs in the above sample that had either: 1) closed their stores, or 2) were not active during the sample collection period, we obtained a total of 4,746 observations from 401 stores. Of these, 291 stores (1,792 observations) posted at least 1 SMM messages on their Weibo accounts during the data collection period. Indeed, omitting stores (and observations) which did not perform any SMM activities on their Weibo accounts can cause sample selection bias. To address this issue, this study used a sample selection model (for more details, please see the model specification section). Using the sample selection model, we ended up with data from 288 online SMEs (1,658 observations) that was used for testing our research hypotheses. The mean of weekly sales volume (i.e., numbers of products sold) of these 288 SMEs was 1508.7 and its standard deviation was 5148.32.

### ***Dependent and Independent Variables***

Our dependent variable, sales performance (SP) was measured by the weekly sales revenue of the SME (Rapp et al. 2013). This was calculated as the sum of weekly sales volume of each product the SME sold multiplied by its price. SMM message type was measured by classifying each of the store's SMM messages into 2 mutually exclusive categories i.e., customer endorsements (MT1) which are re-posts of customers' testimonials and product reviews regarding the store (Athanasopoulos et al. 2001; Bowen 2013), and promotion information (MT2) which are advertisements and events regarding the store's products (Kumar et al. 2016; Swani et al. 2013). MT1 and MT2 were calculated by counting the number of SMM messages posted by the SME in each of the two categories over the week. Customers' engagement behaviors were measured by three variables i.e., total number of: 1) likes (EB1), 2) shares (EB2), and 3) comments (EB3) garnered by the SME's SMM messages over the week (Cvijikj and Michahelles 2013;



Swani et al. 2013; de Vries et al. 2012). Seller identity verification (SIV) was measured as a binary variable, with value 1 if the online SME had both its Weibo and Taobao accounts verified, and 0 otherwise.<sup>2</sup> For testing the interaction effects, the independent variables were grand mean-centered and multiplied with SIV (Dalal and Zickar 2012).

Table 1. Construct Operationalizations		
Construct	Item	Description
Sales Performance	SP <sub>it</sub>	Weekly sales revenue for store <i>i</i> in week <i>t</i> ; a sum of the sales volumes of each product the SME sold multiplied by its price in CNY (Rapp et al. 2013)
Customer Engagement Behaviours (Total Likes, Total Shares, Total Comments)	EB1 <sub>it</sub>	Number of total “Likes” on the SMM messages posted by store <i>i</i> in week <i>t</i> (de Vries et al. 2012; Swani et al. 2013)
	EB2 <sub>it</sub>	Number of total “Shares” of the SMM messages posted by store <i>i</i> in week <i>t</i> (Cvijikj and Michahelles 2013; de Vries et al. 2012)
	EB3 <sub>it</sub>	Number of total comments on the SMM messages posted by store <i>i</i> in week <i>t</i> ; (de Vries et al. 2012)
Message Type (Customer Endorsement, Promotion Information)	MT1 <sub>it</sub>	Number of SMM messages posted by store <i>i</i> in week <i>t</i> that are re-posts of customer testimonials and product reviews regarding the store (Athanasopoulos et al. 2001; Sia et al. 2009)
	MT2 <sub>it</sub>	Number of SMM messages posted by store <i>i</i> in week <i>t</i> that are advertisements and events regarding its products (Swani et al. 2013; Kumar et al. 2016)
Message during Weekends	MW <sub>it</sub>	Proportion of SMM messages posted on weekends (Sat-Sun) by store <i>i</i> in week <i>t</i> ; Number of messages posted on weekends / total number of messages in week <i>t</i>
Message with Images	MI <sub>it</sub>	Proportion of SMM messages with image(s) posted by store <i>i</i> in week <i>t</i> ; Number of messages posted with image(s) / total number of messages in week <i>t</i> (Cvijikj and Michahelles 2013; de Vries et al. 2012)
Firm Age	AGE <sub>it</sub>	Number of months since store <i>i</i> opened its Taobao store
SMM Duration	DUR <sub>it</sub>	Number of months since store <i>i</i> opened its Weibo account
Number of Followers	FLW <sub>it</sub>	Number of users following store <i>i</i> 's Weibo account at the end of week <i>t</i> (Swani et al., 2013)
Number of Friends	FRN <sub>it</sub>	Number of users followed by store <i>i</i> on Weibo at the end of week <i>t</i>
Number of Products	PRD <sub>it</sub>	Number of products listed by store <i>i</i> on Taobao in week <i>t</i>
Product Price	PRC <sub>it</sub>	Average price of products sold by store <i>i</i> in week <i>t</i>
Seller Identity Verification	SIV <sub>i</sub>	Verification logos that are displayed on store <i>i</i> 's Weibo account; 1=verified both Weibo and Taobao accounts, 0 otherwise
Product Category*	PC1 <sub>i</sub>	Dummy variable indicating if store <i>i</i> sells clothing (de Vries et al. 2012)
	PC2 <sub>i</sub>	Dummy variable indicating if store <i>i</i> sells bags (de Vries et al. 2012)
	PC3 <sub>i</sub>	Dummy variable indicating if store <i>i</i> sells footwear (de Vries et al. 2012)
	PC4 <sub>i</sub>	Dummy variable indicating if store <i>i</i> sells accessories (de Vries et al. 2012)
Message Volume*	MV <sub>it</sub>	Total number of SMM messages posted by store <i>i</i> in week <i>t</i> (Kumar et al. 2016)
Competition Intensity*	CPI <sub>i</sub>	Number of subjects in the sample that are selling the same categories of products as store <i>i</i> .

\*Used only for estimating the selection model

### Control Variables

We controlled for other factors that may affect customers' engagement behaviors with online SMEs' SMM messages as well as their sales performance. First, customers' engagement behaviors with SMM messages may depend on the posting time of the SMM messages (Cvijikj and Michahelles 2013; de Vries et al. 2012). To account for this issue, we measured the proportion of SMM messages posted on weekends for the week (MW). Second, prior studies found that customers are more engaged when there are more SMM messages

<sup>2</sup> We also tested alternative operationalization of SIV variable (measuring Weibo SIV and Taobao SIV separately) to ensure the validity of the theoretical mechanisms of SIV proposed in the hypotheses. Interaction terms with this alternative operationalization of SIV and independent variables did not show statistically significant results.

that contain images and videos (Cvijikj and Michahelles 2013; de Vries et al. 2012). In the context of our study, SMM messages can contain images. Thus, the proportion of SMM messages with images (MI) was also controlled for. Third, customers' engagement behaviors with the SME's SMM messages as well as its sales performance can be influenced by the characteristics of the online SME. Hence, the average product price (PRC), number of products (PRD), firm age (AGE), and SMM duration (DUR) of the SME were controlled for. Lastly, the number of followers (FLW) and number of friends/those followed (FRN) of each SME were controlled for, as they can also affect customers' engagement behaviors and SME's sales performance. The construct operationalizations are shown in Table 1.

We also considered controlling for the average star ratings of each SME (ranging from 1 to 5, similar to Amazon.com) that can reflect the quality of the online SME's products as well as customers' satisfaction with the SME (Mudambi and Schuff 2010). However, because 1) Taobao store owners often ask customers to give 5 stars to the product they purchase, and 2) the Taobao system will automatically give 5 stars to products if customers do not provide a review, this variable (with little variance) did not affect our analyses results and was not included in our main analysis. The descriptive statistics and correlation matrix of the variables used for our main analyses are shown in Table 2.

Similar to previous e-commerce studies (Duan et al. 2008; Gu et al. 2012), we applied natural logarithm<sup>3</sup> to the dependent variables as well as the numeric independent count variables so as to smoothen the various relationships that we intended to test. We also adopted this practice for the control variables with large ranges and skewed distributions i.e., except proportion of messages posted during weekends/with images. As per the VIF values shown in Tables 3 and 4, multicollinearity was not an issue in our study.

Constructs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Ln(SP)	1														
2 Ln(EB1)	0.41	1													
3 Ln(EB2)	0.25	0.78	1												
4 Ln(EB3)	0.30	0.48	0.41	1											
5 Ln(MT1)	0.05	0.20	0.27	0.13	1										
6 Ln(MT2)	0.22	0.37	0.30	0.31	-0.02	1									
7 MW	-0.10	-0.03	-0.01	-0.04	-0.03	-0.02	1								
8 MI	-0.12	-0.02	0.06	-0.02	-0.10	0.05	0.09	1							
9 Ln(AGE)	0.31	0.11	0.03	0.06	-0.02	0.07	-0.04	-0.06	1						
10 Ln(DUR)	0.21	0.19	0.07	0.09	0.07	-0.08	-0.08	-0.18	0.27	1					
11 Ln(FLW)	0.43	0.70	0.53	0.29	0.13	0.18	-0.06	-0.08	0.27	0.33	1				
12 Ln(FRN)	0.01	-0.15	-0.13	-0.01	-0.07	-0.07	-0.03	0.06	0.08	0.16	0.03	1			
13 Ln(PRD)	0.37	-0.10	-0.11	0.00	-0.09	0.05	0.00	0.01	0.11	0.00	-0.01	0.11	1		
14 Ln(PRC)	0.12	-0.13	-0.05	-0.02	0.03	0.06	0.02	0.16	0.02	-0.14	-0.05	0.14	0.08	1	
15 SIV	-0.01	0.05	0.07	-0.02	-0.07	-0.09	-0.01	-0.03	0.16	0.08	0.10	0.08	0.09	-0.02	1
Mean	9.05	2.17	1.37	1.25	0.23	1.57	0.31	0.59	3.70	3.61	9.20	5.68	3.63	5.43	0.10
S.D.	3.20	2.00	1.76	1.73	0.45	1.03	0.37	0.42	0.72	0.45	2.12	1.12	0.57	1.55	0.29

### **Model Specification**

We conducted several interviews with customers to ascertain the lag time between reading SMM messages and making purchases from a Taobao store. The interviewees informed us that they and their

<sup>3</sup> ln(variable+1) was used for log-transforming variables because ln(1)=0 (Bartlett 1947).

friends usually purchase products from a SME's Taobao store soon after they read the SMM messages posted by the SME. Hence, we investigated the hypothesized relationships within the same week  $t$ .<sup>4</sup>

Further, the antecedents and consequences of customers' engagement behaviors investigated in our model jointly depend on whether or not the online SME posted SMM messages in each week  $t$ . Analyzing the data without accounting for this conditional relationship can cause an endogeneity issue (Heckman 1979). Therefore, we used Wooldridge's (2002) inverse probability weighted M-estimator for panel data in order to test the research hypotheses. We analyzed the data with this estimator by following a two-step procedure.

First, we conducted a cross-sectional probit regression for SMEs' SMM message posting behavior ( $SMMPOST_{it}=0$  if a SME  $i$  did not post any message in week  $t$ , and 1 if it posted at least 1 message in week  $t$ ; see Equation 1) on the whole sample (4,746 observations) for each week  $t$  and calculated the inverse-mill ratio for each SME  $i$  in each week  $t$ .<sup>5</sup> Lagged values of time-varying variables were used for the selection model because they were captured at the end of each week  $t$ .

$$SMMPOST_{it} = \beta_1 \text{Ln}(MV_{it-1}) + \beta_2 \text{Ln}(AGE_{it-1}) + \beta_3 \text{Ln}(DUR_{it-1}) + \beta_4 \text{Ln}(FLW_{it-1}) + \beta_5 \text{Ln}(FRN_{it-1}) + \beta_6 \text{Ln}(PRD_{it-1}) + \beta_7 \text{Ln}(PRC_{it-1}) + \beta_8 SIV_i + \beta_9 PC1_i + \beta_{10} PC2_i + \beta_{11} PC3_i + \beta_{12} PC4_i + \beta_{13} CPI_i + \varepsilon_{it} \quad (1)$$

Second, econometric models for testing our research hypotheses (see Equations 2-4) were analyzed with pooled OLS regression (including SME and week fixed effects) for SMEs that posted SMM messages (1,658 observations), weighted by the inverse-mill ratio obtained from the first step. Robust standard errors were used and clustered in each SME in this step for addressing potential heteroscedasticity issues which could arise from the panel data structure, following Wooldridge's (2002) recommendation.

Equation (2) was specified for analyzing the impacts of SMM messages on customers' engagement behaviors (H1-2, H3-4). Equation (3) was proposed for assessing the effects of customers' engagement behaviors on sales performance (H5-7).

$$EBx_{it} = \beta_1 \text{Ln}(MT1_{it}) + \beta_2 \text{Ln}(MT2_{it}) + \beta_3 SIV_i^* \text{Ln}(MT1_{it}) + \beta_4 SIV_i^* \text{Ln}(MT2_{it}) + \beta_5 MI_{it} + \beta_6 MW_{it} + \beta_7 \text{Ln}(AGE_{it}) + \beta_8 \text{Ln}(DUR_{it}) + \beta_9 \text{Ln}(FLW_{it}) + \beta_{10} \text{Ln}(FRN_{it}) + \beta_{11} \text{Ln}(PRD_{it}) + \beta_{12} \text{Ln}(PRC_{it}) + \alpha_i + \varepsilon_{it} \quad (2)$$

$$SP_{it} = \beta_1 \text{Ln}(EBx_{it}) + \beta_2 SIV_i^* \text{Ln}(EBx_{it}) + \beta_3 \text{Ln}(AGE_{it}) + \beta_4 \text{Ln}(DUR_{it}) + \beta_5 \text{Ln}(FLW_{it}) + \beta_6 \text{Ln}(FRN_{it}) + \beta_7 \text{Ln}(PRD_{it}) + \beta_8 \text{Ln}(PRC_{it}) + \alpha_i + \varepsilon_{it} \quad (3)$$

where EBx represents total likes (EB1), total shares (EB2), or total comments (EB3). Stata 13.1 (StataCorp. 2013) was used for processing the data and conducting our analyses. The probit command was used to estimate the selection model (see Equation 1). For conducting the other analyses, the areg command was used to control for SME-level time-invariant fixed effects that can influence the hypothesized relationships<sup>6</sup>.

## Analyses Results

Table 3 displays the results from our regression analyses for testing H1-2 and H3-4 (Equation 2). The results from the models without interaction effects (Models 1, 3, and 5; H1a-c and H2a-c) show that the coefficients for customer endorsement and promotion information messages were positive and statistically significant at  $p < 0.001$  level. They were still positive and statistically significant with the interaction terms added (Models 2, 4, and 6). The hypothesized interaction effects between SIV and customer endorsement messages (H3a-c) were not statistically significant for all customer engagement behaviors. However, the interaction effects between SIV and promotion information messages were

<sup>4</sup> We also tested the relationships between lagged values of the independent variables ( $t-1$ ,  $t-2$ ) and dependent variables ( $t$ ) specified in the econometric models (2) and (3) to ensure whether customers immediately react to SMEs' SMM messages or not. None of these alternative specifications showed statistically significant relationships among the independent and dependent variables.

<sup>5</sup> Because the selection model was calculated for each week  $t$ , results of the selection model are not shown here for brevity. Pseudo  $R^2$  values for the selection model ranged between 0.31 and 0.44.

<sup>6</sup> Stata's areg command controls time-invariant effects by demeaning all variables in the model, similar to fixed-effects panel regression (<http://www.stata.com/manuals13/rareg.pdf>). Therefore, it cannot estimate the effects of time-invariant variables (e.g., SIV) on engagement behaviors and sales performance.

statistically significant at  $p < 0.1$  level for total shares (Model 4; H4b) and statistically significant at  $p < 0.01$  level for total comments (Model 6; H4c). Thus, H1a, H1b, H1c, H2a, H2b, H2c, H4b, and H4c were supported, while H3a, H3b, H3c, and H4a were not.

Among the control variables, the proportion of SMM messages with images (MI) was statistically significant at  $p < 0.01$  level across models in Table 3, corroborating prior findings (Cvijikj and Michahelles 2013; de Vries et al. 2012). In addition, the proportion of SMM messages during weekends (MW) was statistically significant at  $p < 0.05 \sim 0.1$  levels except in the case of total comments i.e., models 5 and 6 in Table 3. Number of followers and product price had significant effects for total comments and total likes respectively.

Table 3. Results for Customer Engagement Behaviors						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	DV: Total Likes		DV: Total Shares		DV: Total Comments	
Customer Endorsement (MT1) <b>H1a-c were supported</b>	<b>0.443***</b> (0.076)	<b>0.422***</b> (0.078)	<b>0.743***</b> (0.156)	<b>0.748***</b> (0.161)	<b>0.499**</b> (0.167)	<b>0.487***</b> (0.174)
Promotion Information (MT2) <b>H2a-c were supported</b>	<b>0.647***</b> (0.051)	<b>0.627***</b> (0.055)	<b>0.466***</b> (0.069)	<b>0.431***</b> (0.070)	<b>0.536***</b> (0.098)	<b>0.484***</b> (0.101)
SIV*Customer Endorsement <b>H3a-c were not supported</b>		<b>0.257</b> (0.243)		<b>-0.243</b> (0.656)		<b>-0.032</b> (0.452)
SIV*Promotion Information <b>H4b-c were supported</b>		<b>0.251</b> (0.153)		<b>0.492+</b> (0.288)		<b>0.702**</b> (0.252)
Message during Weekends (MW)	0.159* (0.066)	0.158* (0.066)	0.173+ (0.089)	0.173+ (0.089)	-0.079 (0.091)	-0.080 (0.090)
Message with Images (MI)	0.432*** (0.074)	0.436*** (0.074)	0.397*** (0.117)	0.403*** (0.117)	0.380** (0.135)	0.394** (0.133)
Firm Age (AGE)	0.552 (0.535)	0.561 (0.532)	-1.245 (1.175)	-1.207 (1.160)	-0.718 (1.290)	-0.672 (1.274)
SMM Duration (DUR)	1.063 (1.254)	1.001 (1.243)	0.520 (2.594)	0.494 (2.603)	-1.548 (2.196)	-1.625 (2.274)
Number of Followers (FLW)	-0.029 (0.030)	-0.032 (0.030)	0.004 (0.043)	-0.001 (0.044)	-0.127+ (0.073)	-0.135+ (0.074)
Number of Friends (FRN)	-0.083 (0.743)	-0.112 (0.762)	0.513 (0.494)	0.451 (0.519)	-0.584 (1.014)	-0.670 (1.059)
Number of Products (PRD)	-0.030 (0.066)	-0.027 (0.067)	-0.037 (0.144)	-0.032 (0.146)	0.130 (0.195)	0.138 (0.196)
Product Price (PRC)	0.107* (0.041)	0.110* (0.041)	0.054 (0.053)	0.056 (0.054)	0.061 (0.133)	0.065 (0.134)
Constant	-4.071 (5.797)	-3.738 (5.864)	0.421 (8.461)	0.728 (8.557)	12.409 (9.486)	12.993 (9.679)
SME and Week Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R <sup>2</sup>	0.899	0.900	0.658	0.660	0.517	0.521
F (df1, df2)	11.39*** (20, 287)	12.27*** (22, 287)	6.00*** (20, 287)	5.75*** (22, 287)	6.01*** (20, 287)	6.39*** (22, 287)
VIF (Mean/Max)	1.49/1.89	1.46/1.89	1.49/1.89	1.46/1.89	1.49/1.89	1.46/1.89
Number of SMEs	288	288	288	288	288	288
Number of Observations	1,658	1,658	1,658	1,658	1,658	1,658

+ $p < 0.1$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; Values in parentheses show robust S.E. clustered in each SME

Table 4 presents the results for testing H5-7 (Equation 3). To test these hypotheses, we focused on SMEs for whom the number of Weibo followers (FLW) is above the median (median=2,084). This is because: 1) diffusion of information on social media is the major mechanism through which customer engagement behaviors impact sales performance in our study, and 2) prior studies on social media suggest that a critical mass (or threshold) of audience is required for initiating information diffusion in social media networks (Koren et al. 2014; Susarla et al. 2011). As we hypothesized, none of the main effects of customer engagement behavior variables were statistically significant. On the other hand, SIV\*total likes (H5) was statistically significant at  $p < 0.1$  level (Model 2) and SIV\*total shares (H6) was statistically significant at  $p < 0.05$  level (Model 4). However, SIV\*total Comments (H7) was not statistically significant (Model 6). Thus, H5 and H6 were supported, while H7 was not.

Table 4. Results for Sales Performance						
DV: Sales Performance	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Total Likes	0.079 (0.060)	0.052 (0.069)				
SIV*Total Likes <b>H5 was supported</b>		<b>0.208+</b> <b>(0.124)</b>				
Total Shares			-0.041 (0.050)	-0.059 (0.052)		
SIV*Total Shares <b>H6 was supported</b>				<b>0.312**</b> <b>(0.110)</b>		
Total Comments					-0.013 (0.039)	-0.020 (0.042)
SIV*Total Comments <b>H7 was not supported</b>						<b>0.055</b> <b>(0.051)</b>
Firm Age (AGE)	-2.732 (3.057)	-2.673 (3.047)	-2.629 (3.016)	-2.619 (2.999)	-2.605 (3.018)	-2.560 (3.002)
SMM Duration (DUR)	-18.054** (6.941)	-18.058** (6.923)	-17.805** (6.867)	-17.844** (6.834)	-17.944** (6.878)	-17.972** (6.875)
Number of Followers (FLW)	-0.369 (0.625)	-0.378 (0.622)	-0.278 (0.646)	-0.307 (0.636)	-0.291 (0.640)	-0.298 (0.641)
Number of Friends (FRN)	0.150 (1.744)	0.206 (1.746)	0.201 (1.715)	0.283 (1.719)	0.172 (1.721)	0.186 (1.724)
Number of Products (PRD)	1.472** (0.424)	1.485*** (0.420)	1.495** (0.407)	1.515*** (0.403)	1.491** (0.414)	1.493** (0.413)
Product Price (PRC)	0.397* (0.167)	0.401* (0.166)	0.408* (0.164)	0.409* (0.162)	0.407* (0.166)	0.407* (0.166)
Constant	81.825** (28.604)	81.319** (28.549)	79.180** (28.236)	79.021** (28.087)	79.929 (28.292)	79.8355** (28.263)
SME and Week Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R <sup>2</sup>	0.837	0.838	0.837	0.838	0.837	0.837
F (df1, df2)	5.53*** (16, 192)	5.67*** (17, 192)	6.05*** (16, 192)	6.20*** (17, 192)	5.67*** (16, 287)	5.42*** (17, 192)
VIF (Mean/Max)	1.65/2.55	1.63/2.75	1.53/1.89	1.51/1.89	1.49/1.93	1.48/1.93
Number of SMEs	193	193	193	193	193	193
Number of Observations	1,205	1,205	1,205	1,205	1,205	1,205

+ $p < 0.1$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; Values in parentheses show robust S.E. clustered in each SME

Among the control variables, the number (PRD) and average price (PRC) of products positively impacted sales performance (at  $p < 0.05$  level) across all models in Table 4, as expected. In addition, SMM Duration

was found to negatively affect sales performance ( $p < 0.01$  level). This could be due to the nature of the non-luxury fashion retail industry that our online SMEs belong to. For this kind of SMEs, customers may prefer to make their purchases from newer shops that offer products with novel and unique styles (Zarrolì 2013).

### **Post-Hoc Analyses**

As a post-hoc test, we conducted subgroup analyses comparing online SMEs with and without SIV to investigate the role of trust (SIV as a proxy), which interaction terms may not be able to assess (Sharma et al. 1981). About 10% of the online SMEs in our sample had SIV=1. In both groups, customer endorsement (H1a-c) and promotion information (H2a-c) messages positively influenced all customer engagement behaviors i.e., total likes, shares, and comments (at  $p < 0.001$  level), similar to the results reported in Table 3. In addition, none of the customer engagement behaviors positively impacted sales performance for the online SMEs without SIV (i.e., H5-H7 were not supported for them), resembling the main effects of customer engagement behaviors on sales performance reported in Table 4. However, all customer engagement behaviors positively affected sales performance for the online SMEs with SIV (total likes and shares at  $p < 0.05$  level, total comments at  $p < 0.1$  level). Further, promotion information messages directly impacted sales performance in the case of online SMEs with SIV (at  $p < 0.05$  level), which our main pooled data analysis did not reveal.

Thus, we further conducted a mediation analysis on the SMEs with SIV by following Baron and Kenny's (1986) 4-step procedure to investigate if customer engagement behaviors mediated the effects of SMM messages on sales performance for them. As mentioned above, promotion information messages ( $X \rightarrow Y$ ; path c; step 1) and all customer engagement behaviors ( $X \rightarrow M$ ; path a; step 2) positively impacted sales performance in the case of SMEs with SIV. When sales performance was regressed on promotion information messages and each customer engagement behavior ( $X, M \rightarrow Y$ ; path b and c'; steps 3 and 4) with customer endorsement messages and control variables included as well, promotion information messages was always statistically significant at  $p < 0.05$ -0.1 level while only total shares was statistically significant at  $p < 0.1$  level. Subsequently, a Sobel test on the indirect effect of these messages mediated by total shares (path ab) was statistically significant at  $p < 0.1$  level, suggesting that total shares partially mediates the effects of promotion information messages on these SMEs' sales performance.<sup>7</sup> This result is novel in terms of directly testing and showing that customer engagement mediates the effect of SMM messages on sales performance.

## **Discussion**

Our findings offer several insights about the impact of online SMEs' SMM messages on customer engagement behaviors and sales performance. First, posting SMM messages with customer endorsements or promotion information can engage customers with the online SME (H1a-c and H2a-c are supported). These results provide evidence for practitioner suggestions on how online SMEs can elicit customer engagement behaviors through their SMM messages. Particularly, customer endorsement messages could be salient for online SMEs, as they strive to build trust and their reputation with customers.

Second, seller identity verification plays an important role for online SMEs to engage their customers through SMM and increase sales performance. Specifically, customers are more likely to engage (through shares and comments) when there are more promotion information messages and the online SME is verified (H4b-c are supported). However, likes may require less involvement and effort from the customer and therefore SME verification is not important in the case of likes (H4a is not supported).

Further, SME verification did not impact the relationship between customer endorsement messages and customer engagement behaviors (H3a-c are not supported). This could be because customers often perceive other customers as credible sources of information on firms' products and services (Sia et al. 2009; Wang 2005), thus negating the importance of SIV for customer endorsements. Additionally,

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<sup>7</sup> This result also implies that there is a possibility of a moderated mediation relationship between SIV, promotion information, and sales performance (MacKinnon et al. 2007). Yet, the data and econometric approach used in our study does not allow us to use Structural Equation Modeling (SEM) based techniques which are required for testing a such relationship (e.g., Preacher et al. 2007).

customer engagement behaviors in the form of likes and shares positively impacted sales performance for verified SMEs (H5 and H6 are supported), while our post-hoc results suggest that this finding also holds for comments (though H7 was not supported in our main analysis). Overall, these findings highlight the importance of building customer trust through SME store verification for e-commerce and SMM.

Third, the results for our control variables provide additional insights on SMM for online SMEs. For instance, positive effects of the proportion of SMM messages with images (MI) and SMM messages posted during weekends (MW) on customer engagement highlight the importance of visual contents and posting times of SMM messages. In addition, the negative impacts of SMM duration (DUR) on sales performance could result from customers' desire for novelty in fashion products.

However, the findings of our study should be interpreted in light of its limitations. First, we tested our hypotheses with data from a single industry with highly diverse and heterogeneous products (fashion retail; Appleford 2013), collected from one social media service and one e-commerce platform (Weibo and Taobao) in China, albeit with a number of SMEs. Researchers suggest that characteristics of a product and cultural differences could affect customer behavior toward the product (e.g., Mooji 2011). In addition, while Facebook displays postings by "importance" calculated by its own algorithm (i.e., News Feed), Weibo generally displays its users' posts by time order similar to Twitter. Therefore, further investigations of the proposed theoretical model with other countries, industries, social media, and e-commerce platforms can enhance our understanding of the impacts of online SMEs' SMM messages and SIV on customer engagement and sales performance. Second, we focused on one trust cue (seller identity verification) offered by social media and e-commerce platforms. Prior research suggests that other cues on websites (e.g., quality of images, video, text or speech) are alternative sources of customer trust (Riegelsberger et al. 2003), which could be explored in future research on SME's SMM effectiveness. Third, we investigated sales performance as our main outcome variable. While such financial outcomes are important (Sashi 2012), examining other firm-level outcomes such as customer retention and firm reputation would also be useful (van Doorn et al. 2010). Lastly, this study focuses on SMEs' SMM messages (i.e., marketing messages posted on SMEs' social media account) by using fixed-effects model. Indeed, other types of messages posed on a SME's social media account (e.g., interactions between the SME and its customers) may affect existing and potential customers' attitude toward the SME which in turns affect customer engagement behaviors and sales performance (Chung and Austria 2010). Studying the impact of SMEs' social media messages other than marketing messages would be a promising direction for future studies.

## **Contributions and Conclusion**

Our findings offer several contributions to theory and practice. In terms of theory, our study contributes to the growing literature on SMEs' e-marketing practices (Eid and El-Gohary 2013; Fillis et al. 2003; Gilmore et al. 2007). While SMEs are interested to know about the effectiveness of their SMM, empirical studies in this area are still scarce and mainly focused on large firms (Rapp et al. 2013; Trainor et al. 2014). Our study adds to this line of research by empirically investigating the effects of SMEs' SMM messages on their customer engagement and sales performance. Further, it modeled and tested the role of trust in SMEs' SMM through seller verification, which has not been empirically examined in the prior literature on SMM messages.

Our study also contributes to the literature on SMM impacts. Particularly, it examines the less-investigated concept of customer endorsement (Bowen 2013; Senecal and Nantel 2004) and shows that customer endorsements used as SMM messages can elicit customer engagement behaviors (and subsequent sales performance). Further, we investigate the impact of online SMEs' SMM using data from multiple firms, thus addressing the gaps in prior studies that were mainly conducted on large firms with both online and offline presence (e.g., Goh et al. 2013; Kumar et al. 2016; Rishika et al. 2012). Additionally, our post-hoc results are novel in showing that customer engagement (in the form of shares) partially mediates the effects of promotion information messages on verified SMEs' sales performance.

For practice, this study offers several guidelines to different stakeholders i.e., online SMEs, customers, and e-commerce as well as social media platform providers. For online SMEs, it is important for them to present both direct promotion information messages as well as make the effort to identify and repost customer testimonials and reviews as part of their SMM strategy. They should also comply with the

requirements and seek seller identity verification as it offers substantial benefits in terms of engaging customers and enhancing sales. For customers, they should be aware of the pitfalls of relying on promotion information or customer endorsements if the seller has not been verified. Indeed, they should actively look for their desired products from online SMEs that have been verified as this can reduce quality, security, and privacy risks of engaging and transacting with the firm. Last, social media platforms could offer online SMEs tools to easily incorporate and disseminate promotion information and customer endorsements for their SMM. Both social media and e-commerce platforms could make the rules for seller identity verification clear and transparent so the online SMEs would know precisely what to do in order to gain such valuable certification. Yet, the platforms also have to ensure compliance once the firm has been verified.

Overall, this study investigates the effectiveness of SMEs' SMM messages in terms of their impacts on customer engagement behaviors and sales performance. Our research model based on prior SMM literature was tested with 288 online SMEs in the fashion retail industry operating on Taobao and Weibo. Our results show that posting SMM messages with customer endorsement and promotion information can elicit customer engagement behaviors in the form of likes, shares, and comments. However, customer engagement behaviors positively affect sales performance only if SMEs could provide a trust cue (i.e., SIV), suggesting the importance of trust in the SME (and SMM) context. These findings can help online SMEs enhance their SMM as well as add to research in this area.

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## Appendix A: Examples of Seller Identity Verification (SIV) Logos



Figure A1. An Example of a SME's Enterprise-verified Weibo Profile (in the Case of Taobao Shop), a Seller Identity Verification (SIV) Method Weibo Provides



Figure A2. An Example of a SME's Seller Identity Verification (SIV) Logos on Taobao