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How Does Online Shopping Shape the Sense of Community? The Mediating Role of Various Social Activities

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Abstract: The rapid expansion of digital commerce, particularly same-day-delivery and next-day-delivery online shopping, is transforming daily life and community dynamics in urban settings. This study explores how these shopping behaviors impact the sense of community by mediating various social activities at both individual and community levels. Using an online survey design, this study analyzes the mediating roles of different types of social interactions, including informal social gatherings and organized community events, in shaping a sense of community. The findings reveal that while both unplanned, low-threshold interactions and more structured, organized activities contribute to a sense of community, their effects vary in strength. Stronger, more deliberate social interactions, such as resident-led events, show a full mediation effect, whereas casual, spontaneous encounters provide partial mediation. Similarly, organized community events demonstrate different levels of influence, with community-organized activities fully mediating certain sense of community dimensions and resident-engaged activities providing more comprehensive impacts. These findings highlight that same-day-delivery and next-day-delivery online shopping behaviors significantly shape the sense of community by facilitating both informal and organized social interactions.

Keywords: sense of community; same-day delivery and next-day delivery; social activity; mediation effect; community-based organizations

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1. Introduction

The sense of community (SOC) refers to the feeling of belonging, connectedness, and mutual support among members of a group. The theory of SOC was originally developed in 1976 and subsequently presented by McMillan and Chavis [1]. This feeling is characterized by shared values, goals, and interests, as well as a commitment to the well-being of each other and the community as a whole. A large body of literature has evidenced that building an SOC is key to improving people's mental health [2] and well-being [3]. However, many residents in large cities with high population density are facing issues of losing SOC, thus leading to an increase in mental health issues such as depression and anxiety [4,5]. Thus, in urban areas, especially those with high population density, there is a burgeoning recognition of the numerous benefits associated with having an SOC. A study in China examined how different built environment attributes affect SO and found that some particular categories of urban amenities appear to enhance the positive effect of perceived environment quality on SOC [6]. Besides environmental driver factors, different dimensions of daily life may also have an impact on SOC, such as individual activity spaces, activity diversity, and

frequent use of local facilities [7]. Therefore, examining the relationship between different daily activities and SOC is essential to further understand the potential influence factors of growing an SOC.

In recent years, the popularity of online shopping has skyrocketed worldwide, significantly impacting the daily lives of residents, and many studies have discussed the economic, social, environmental, and cultural impacts of online shopping around the world [8–10]. Various concerns arise related to the growth and impact of online shopping in the urban and spatial planning context. Shi et al. suggested that online shopping could be regarded as a possible solution for urban congestion [11]. Rao explored how online shopping may foster or endanger urban public life [12]. In contrast, some researchers also examined how built environment elements influence the frequency of online shopping [13,14]. Flourishing online shopping could reshape residents' daily lives in the community, particularly through same-day delivery and next-day delivery (SDD and NDD) online shopping, which are more convenient and time-saving [15,16]. Compared to regular online shopping, SDD and NDD online shopping has two main features: faster logistics and more daily necessities of shopping products. A study revealed that SDD online shopping substituted for local store shopping [17]. Despite this extensive research, a crucial aspect remains underexplored: the relationship between SDD and NDD online shopping and the SOC. As urban planners strive to create cohesive and vibrant communities, understanding how the rise of online shopping affects social cohesion, local interactions, and community engagement is essential. Especially in Shanghai, a metropolis with a highly segregated socio-spatial structure [18,19]. This study holds the potential to reveal insights that can guide the development of a more resilient and connected community, ensuring that digital commerce does not come at the cost of social fragmentation.

SDD and NDD online shopping saves individuals time on travel and in-store shopping, allowing for more time to socialize with neighbors. A study evidenced that SDD online shopping increases social gatherings with neighbors while undermining community vitality and social cohesion [15]. This shows that the impact of SDD and NDD online shopping on residents' community social activities is complex and cannot be generalized. Meanwhile, socializing with neighbors is crucial for strengthening social bonds, deepening a sense of belonging, and reinforcing identity through sharing emotions and experiences [5]. For example, a study found a positive relationship between social activity and SOC among older Chinese Americans [20]. Ross and Searle revealed that leisure time physical activity behaviors were positively associated with SOC [21]. Researchers found that SOC was linked to leisure walking, rather than brisk walking, suggesting that social factors may play a role in this pattern [22]. Therefore, SDD and NDD online shopping might enhance SOC by influencing social interactions with neighbors, but these potential effects have not been thoroughly explored.

The variety of social activities in the community makes it challenging to make generalizations. From the relevant literature, we have identified two main types of social activities, each representing individual and community levels separately: informal social gatherings with neighbors and community events [5,15,23–25]. SDD and NDD online shopping could enhance SOC by encouraging social activity through several mechanisms.

At the individual level, SDD and NDD online shopping creates opportunities for personal interactions that can enhance social connections within the community. Consumers could communicate with local businesses and neighbors through product inquiries, reviews, and feedback. This transforms transactions into social interactions, promoting a sense of connection to one's community [5,24]. Additionally, the frequent contact between residents and local delivery personnel might foster familiarity, building informal relationships that further tie individuals to their local environment.

At the community level, SDD and NDD online shopping can promote collective action and group interaction. In China, collective purchasing models are trending [26,27], such as community group buying, which encourages residents to cooperate by pooling orders for shared economic benefits [28]. This form of collaboration might foster trust and

interaction among neighbors, reinforcing social bonds within the community. Furthermore, online platforms often provide spaces for community discussions and information sharing, where residents can recommend products, exchange shopping tips, or organize collective purchases, thus increasing the overall level of social participation within the community. Additionally, some e-commerce platforms host events that translate online shopping activity into offline social interactions, such as charity drives or community gatherings [29,30]. These events offer opportunities for residents to meet and engage in a collective context, which could further enhance SOC.

By analyzing these mechanisms, this study aims to understand how SDD and NDD online shopping can catalyze building stronger SOC through various social activities in Shanghai. This impact is intricate and has not been thoroughly examined. Our study attempts to address this research gap for the first time in the literature by applying mediation analysis to demonstrate the specific actions that individuals and communities should take to promote SOC and enhance individual well-being in the age of widespread Internet and smartphone use. Through these pathways, SDD and NDD online shopping offer a new way of life and have the potential to extend beyond individual consumption, serving as a driver of social capital and community resilience.

2. Materials and Methods

2.1. Study Site

As the critical strategic metropolis in the Yangtze River Delta region and the multifunctional economic center of China, Shanghai had a permanent resident population of 24.87 million in 2023 [31]. In 2014, Shanghai introduced the "15-min community life circle" concept and incorporated it into the Shanghai 2035 Master Plan, emphasizing human-centered planning at the micro-spatial level with communities as the basic unit [32]. Meanwhile, the development of Shanghai as a smart city has facilitated the creation of an online network of community life circles, enhancing smart management at the community scale. Thus, Shanghai serves as a representative case for studying the relationship between online shopping and the sense of community at the community level.

In Shanghai, same-day and next-day delivery services for online shopping have become quite mature, with the following common three models: (1) Collaboration with local stores: E-commerce platforms partner with large supermarkets or convenience stores in the area. Users can select products from nearby stores on the platform, with the local stores handling the preparation of goods, while the e-commerce platform's delivery network is responsible for the shipping [33]. (2) Community group buying model: Community group buying is organized at the neighborhood level, usually led by a "community leader" (often a resident within the community). The leader organizes group purchases among neighbors on the platform, and the platform delivers bulk orders to the community leader, who then distributes them to users or delivers them on their behalf [26–28]. (3) Logistics networks operated by courier companies: These e-commerce platforms have multiple delivery stations located in various neighborhoods across Shanghai. After the products are shipped from the platform's own warehouse, they enter the city's delivery stations, where couriers complete the last-mile delivery to the customer [34].

Given its significance, this study was conducted across all 16 districts of Shanghai, employing a sampling method based on the population proportion of each district to ensure comprehensive representation. An online questionnaire survey was conducted from 4 June to 31 July 2024. Of the 412 residents invited to participate, 330 completed the survey, resulting in a high response rate of 80.10%. Details of the questionnaire can be found in the Supplementary Materials.

2.2. Data Collection

2.2.1. Online Shopping

We conducted a survey focusing on respondents' use of electronic devices and their SDD and NDD online shopping characteristics. Initially, respondents were asked to pro-

vide details regarding their level and duration of electronic device usage to comprehend their dependency on such devices. Respondents were tasked with selecting the type of shopping that significantly impacted their community life. Additionally, we gathered data on respondents' frequency of offline shopping and the degree to which their online shopping habits influenced it (whether there was no influence, a positive correlation, or a negative correlation).

2.2.2. Social Activity (Mediating Variable)

This study examines social activities at the community level from individual and community levels, encompassing informal social gatherings with neighbors and organized community events. A total of seven questions across four variables were designed to differentiate between various types of social interactions. Table 1 provides a detailed breakdown of the measurement items.

Table 1. Contents of longitudinal quantitative questionnaire items of Social Activity (SA).

Type of Organizing Entity	Mediating Variables	Longitudinal Quantitative Survey Item [1]
informal social gatherings with neighbors	Mediating Variable 1 [5,15]	Q1: How willing are you to greet or interact with neighbors in public areas?
	Mediating Variable 2 [5,15,23,35]	Q2: How willing are you to join self-organized activities like family dinners or private gatherings?
		Q3: How willing are you to participate in planned group activities, like walking, childcare, or dancing?
		Q4: How willing are you to help neighbors in need?
organized community events	Mediating Variable 3 [4,24,25]	Q5: How willing are you to join community-organized service events, like car washes or festival giveaways?
	Mediating Variable 4 [5,25,36]	Q6: How willing are you to participate in cleaning and environmental protection activities organized by the community (such as community cleanup days or waste sorting awareness campaigns)?
		Q7: How willing are you to participate in volunteer projects organized by the community and provide support for community activities?

[1] The scale of each item: 5—Satisfied, 4—Slightly satisfied, 3—Neutral, 2—Slightly unsatisfied, 1—Very unsatisfied.

Previous literature typically assesses informal social gatherings with neighbors along four dimensions: (1) weaker social ties, such as chance encounters; (2) stronger social ties, such as self-organized neighborhood activities; (3) supportive behaviors among neighbors; and (4) neighbor-related disturbances [15]. In line with these dimensions, our study employs four questions to capture the strength of social ties in neighborhood interactions:

- Mediating Variable 1 includes a single question on the willingness to engage in unplanned interactions (M1), like greeting neighbors in passing (Q1);
- Mediating Variable 2 consists of three questions that measure willingness for stronger interactions (M2), including self-organized gatherings (Q2), planned neighbor activities (Q3), and supportive actions (Q4).

For community-organized social activities, the study categorizes these interactions based on the nature of community service provided, which are non-profit activities aimed at serving local community residents [24]. Two distinct types of community-organized activities are identified and measured:

- Mediating Variable 3 refers to community-organized service activities (M3), which involve direct services provided to residents (Q5) (e.g., community clean-up days or environmental protection initiatives);

- Mediating Variable 4 refers to resident-engaged service-oriented activities (M4), which involve residents volunteering to support others (Q6) and contributing to community events (Q7).

2.2.3. Sense of Community

Sense of community (SOC) was determined based on 8 items consisting of four key components: membership, influence, integration and fulfillment of needs, and shared emotional connections [4,5]. These were determined via a self-reported questionnaire. We divided the subjective satisfaction of each item into a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating a higher SOC. Table 2 depicts the contents of the questionnaire of SOC.

Table 2. Contents of longitudinal quantitative questionnaire items of Sense of Community Scale (SOC) [1].

Sense of Community (SOC) Subconstruct	Longitudinal Quantitative Survey Item
membership	I belong in this neighborhood.
	I feel I am an important part of this community.
influence	The matters and decisions made within this community are of great importance to me.
	I have a say in community affairs.
integration and fulfillment of needs	I can get what I need in this neighborhood.
	This community satisfies my social and emotional needs.
shared emotional connections	I feel a strong emotional connection with other members of this community.
	Participating in community activities has helped me develop deep emotional bonds with others.

[1] The scale of each item: 5—Strongly agree, 4—Agree, 3—Neither agree nor disagree, 2—Disagree, 1—Strongly disagree.

2.2.4. Socioeconomic Attributes (Covariant)

This study examined various socioeconomic attributes including gender, age, educational background, occupation, and household income. Additionally, respondents were queried about their household registration, the administrative district of their residence, and the duration of their current residency in the neighborhood.

2.3. Data Analysis

The descriptive statistics and correlation analyses were performed using SPSS software (version 25.0 for Windows; SPSS, Chicago, IL, USA) in the current study. The Hayes PROCESS macro was used to test the hypotheses in this study [37]. We investigated the potential mediation role of unplanned interactions (M1, Model 1), stronger interpersonal interactions (M2, Model 2), community-organized service activities (M3, Model 3), and resident-engaged service-oriented activities (M4, Model 4) in the association between residents' online shopping habits and their sense of community (SOC) while adjusting for covariates such as gender, age, educational background, occupation, and income. Ultimately, to assess the statistical significance of our model, we employed a 95% percentile bootstrap confidence interval (CI) technique, generating 5000 bootstrapped samples. Indirect effects were considered significant if the bootstrap confidence intervals did not contain 0.

3. Results and Analysis

3.1. General Statistics

Table 3 presents the demographic characteristics of the participants, including gender, age, household registration type, length of residence in the community, occupation, educational background, and household income. Table 4 highlights the differences in participants'

online and offline shopping habits. A total of 45.46% of participants use SDD and NDD online shopping 1–2 times per week. Although online shopping is used more frequently, offline shopping still maintains a strong presence, with 34.55% of respondents engaging in offline shopping at least once a week.

Table 3. Demographic information of participants.

Categories	Variables	Number of Participants	Percentage (%)
Gender	Male	132	40.00
	Female	198	60.00
Age	≤20	7	2.12
	21–30	77	23.33
	31–40	149	45.15
	41–50	74	22.43
	51–60	16	4.85
	≥61	7	2.12
Household registration	Yes	289	87.58
	No	41	12.42
Duration of residency	≤2	11	3.33
	2–4	15	4.55
	4–6	19	5.76
	6–8	26	7.88
	8–10	27	8.18
	≥10	232	70.30
Occupation	Employees of government institutions	10	3.03
	Workers	228	69.09
	Teachers	16	4.85
	Freelances	21	6.36
	Privately or individually owned business	19	5.76
	Retirees	12	3.64
	Students	13	3.94
	Others	11	3.33
Educational background	Middle school or below	8	2.42
	Vocational school or high school	14	4.24
	College or undergraduate	276	83.64
	Graduate or above	32	9.70
Household income	≤3000	2	0.61
	3001–6000	13	3.94
	6001–10,000	101	30.60
	≥10,001	214	64.85

Table 4. Survey of shopping characteristics.

Categories	Variables	Number of Participants	Percentage (%)
Online shopping usage: Frequency of same-day delivery and next-day delivery	Rarely	6	1.82
	1–2 times per month	57	17.27
	1–2 times per week	150	45.46
	3–4 times per week	87	26.36
	More than 5 times per week	30	9.09
Offline shopping usage: Overall frequency of offline shopping	Rarely	28	8.48
	1–2 times per month	107	32.42
	1–2 times per week	114	34.55
	3–4 times per week	69	20.90
	More than 5 times per week	12	3.65

3.2. Results of Mediating Effect Models

This study categorizes social activities into four modes based on engagement level: unplanned interactions (M1), stronger interactions (M2), community-organized service activities (M3), and resident-engaged service-oriented activities (M4) (see Section 2.2.2). It analyzes their mediating roles in the relationship between the frequency of SDD and NDD online shopping and the sense of community, including membership, influence, integration and fulfillment of needs, and shared emotional connections. The results confirm a significant positive mediating effect of social interactions on this relationship.

3.2.1. Results of Model 1

In Model 1, unplanned interactions (M1) refer to spontaneous, casual engagements between residents, such as greeting neighbors in passing or brief encounters in public areas. Figure 1 illustrates the significant direct and indirect effects of SDD and NDD online shopping on the sense of community (SOC), with unplanned interactions at the individual level (M1) serving as a mediating variable. These findings suggest that M1 acts as a partial mediator in the relationship between online shopping and SOC.

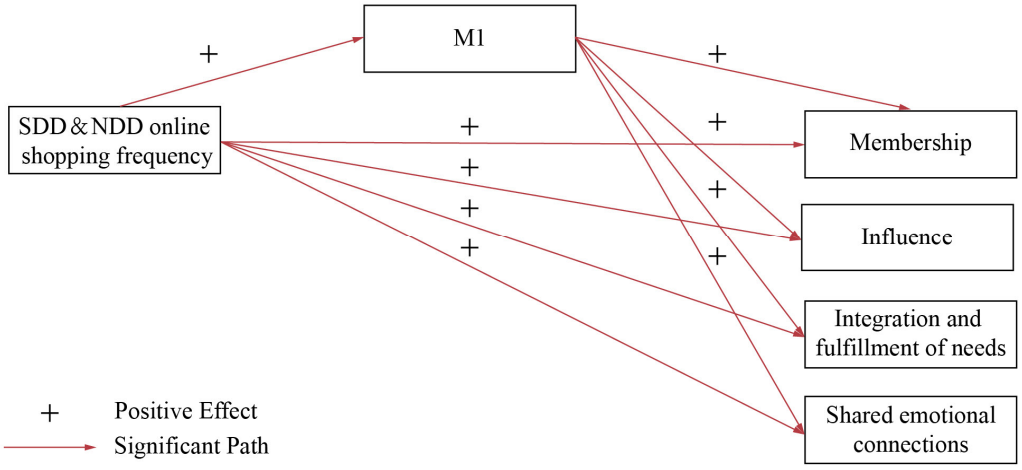

Figure 1. The mediating effect model of M1 (Model 1).

Table 5 presents the results of Model 1. First, the frequency of SDD and NDD online shopping has a significant positive effect on M1 (β = 0.224), indicating that a higher frequency of SDD and NDD online shopping increases the likelihood of residents engaging in unplanned interactions (M1). Second, M1 significantly and positively influences all four dimensions of SOC—membership (β = 0.168), influence (β = 0.434), integration and fulfillment of needs (β = 0.420), and shared emotional connections (β = 0.421). Furthermore, the frequency of SDD and NDD online shopping demonstrates a significant positive direct effect on SOC, particularly noticeable in the dimensions of membership, integration and fulfillment, and shared emotional connections. The indirect effects of online delivery frequency via M1 are also positive and significant for membership (β = 0.111), influence (β = 0.097), integration and fulfillment of needs (β = 0.094), and shared emotional connections (β = 0.094), confirming M1′s partial mediating role.

Overall, the findings indicate that a higher frequency of online shopping is associated with an increased sense of community among residents through more frequent chance encounters and greetings (M1). These spontaneous interactions significantly enhance residents' sense of belonging and influence, confirming that unplanned interactions are a key mechanism through which online shopping shapes SOC. The significant direct effects further highlight that unplanned interactions are a key pathway through which online shopping influences SOC.

Table 5. Test of direct and indirect effects of M1 as a mediating variable (Model 1).

Paths		β	95% CI	
			Lower CI	Upper CI
X [1]→M1 [2]		0.224 ***	0.065	0.183
M1→MB [3]		0.168 ***	0.394	0.575
Direct Effect	X→MB	0.279 ***	0.041	0.141
Indirect Effect	X→M1→MB	0.111 **	0.030	0.092
M1→IN [4]		0.434 ***	0.334	0.527
Direct Effect	X→IN	0.255 **	0.034	0.140
Indirect Effect	X→M1→IN	0.097 **	0.026	0.084
M1→IFN [5]		0.420 ***	0.313	0.501
Direct Effect	X→IFN	0.272 ***	0.043	0.148
Indirect Effect	X→M1→IFN	0.094 *	0.024	0.081
M1→SEC [6]		0.421 ***	0.348	0.556
Direct Effect	X→SEC	0.277 ***	0.051	0.166
Indirect Effect	X→M1→SEC	0.094 **	0.047	0.149

[1] X—SDD and NDD online shopping frequency. [2] M1—unplanned interactions. [3] MB—membership. [4] IN—influence. [5] IFN—integration and fulfillment of needs. [6] SEC—shared emotional connections. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

3.2.2. Results of Model 2

Stronger interactions (M2) refer to more deliberate informal social gatherings with neighbors, such as resident-led gatherings, planned activities, or support for neighbors. Figure 2 illustrates that the stronger interpersonal interactions (M2), such as resident-led gatherings and events, function as a full mediator in the model. Unlike Model 1, there is no significant direct effect of SDD and NDD online shopping on SOC in Model 2, confirming that M2 fully mediates the relationship. This suggests that the frequency of online shopping influences the sense of community (SOC) primarily by enhancing the quality of deeper social interactions among residents.

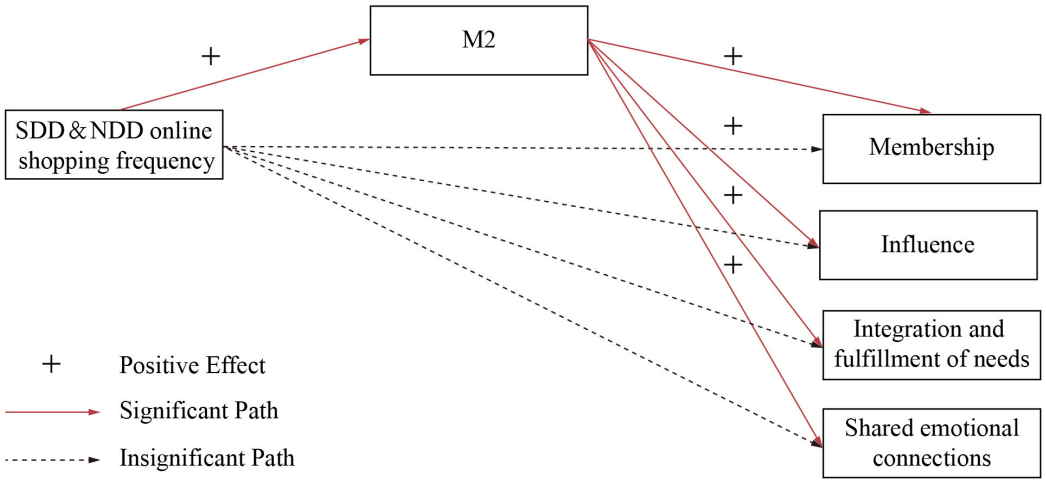

Figure 2. The mediating effect model of M2 (Model 2).

As shown in Table 6, consistent with Model 1, the frequency of using SDD and NDD online shopping has a significant positive effect on M2 (β = 0.372). In turn, M2 has a significant positive effect on all four dimensions of the sense of community: membership (β = 0.693), influence (β = 0.578), integration and fulfillment of needs (β = 0.596), and shared emotional connection (β = 0.652). Moreover, the indirect effects of SDD and NDD online shopping on these four SOC dimensions are all positive and significant: membership (β = 0.258), influence (β = 0.215), integration and fulfillment of needs (β = 0.221), and shared emotional connection (β = 0.242).

Table 6. Test of direct and indirect effects of M2 as a mediating variable (Model 2).

Paths		β	95% CI	
			Lower CI	Upper CI
X [1]→M2 [2]		0.372 ***	0.123	0.215
M2→MB [3]		0.693 ***	0.724	0.922
Direct Effect	X→MB	0.279	−0.034	0.057
Indirect Effect	X→M2→MB	0.258 ***	0.098	0.183
M2→IN [4]		0.578 ***	0.585	0.812
Direct Effect	X→IN	0.255	−0.030	0.074
Indirect Effect	X→M2→IN	0.215 ***	0.076	0.164
M2→IFN [5]		0.596 ***	0.594	0.811
Direct Effect	X→IFN	0.272	−0.022	0.077
Indirect Effect	X→M2→IFN	0.221 ***	0.146	0.295
M2→SEC [6]		0.652 ***	0.738	0.966
Direct Effect	X→SEC	0.277	−0.031	0.073
Indirect Effect	X→M2→SEC	0.242 ***	0.096	0.192

[1] X—SDD and NDD online shopping frequency. [2] M2—stronger interpersonal interactions. [3] MB—membership. [4] IN—influence. [5] IFN—integration and fulfillment of needs. [6] SEC—shared emotional connections. *** $p < 0.01$.

Notably, in contrast to Model 1, Model 2 demonstrates that the indirect effects mediated by M2 are more pronounced compared to Model 1. This suggests that the sense of community is primarily enhanced through resident-led interactions, such as organized gatherings, rather than casual exchanges. The results suggest that the enhancement of the sense of community with an increased frequency of using SDD and NDD online shopping is more effectively achieved through deeper interactions rather than casual exchanges.

3.2.3. Results of Model 3

Community-organized service activities (M3) involve collective actions organized by the community, such as clean-up events or charity drives. As shown in Figure 3, at the community level, using community-organized service activities (M3) as a mediator, both direct and indirect effects are significant.

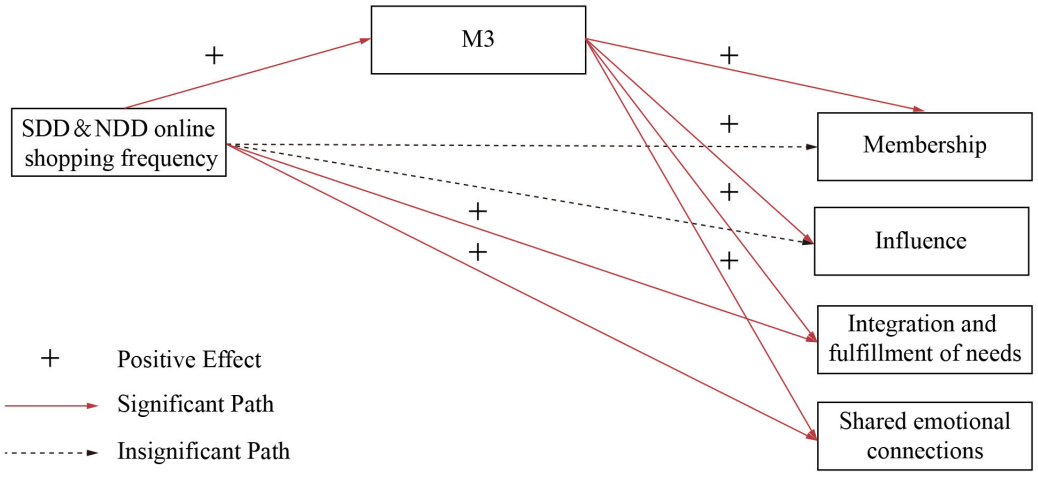

Figure 3. The mediating effect model of M3 (Model 3).

Table 7 presents the model results, indicating that the frequency of using SDD and NDD online shopping has a significant positive effect on M3 (β = 0.362), and M3, in turn, has significant positive effects on the four dimensions of the sense of community: membership (β = 0.590), influence (β = 0.458), integration and fulfillment of needs (β = 0.465), and shared emotional connection (β = 0.467). Furthermore, consistent with Models 1 and 2, the frequency of using SDD and NDD online shopping has significant positive indirect

effects on all four dimensions of the sense of community: membership (β = 0.213), influence (β = 0.165), integration and fulfillment of needs (β = 0.169), and shared emotional connection (β = 0.169).

Table 7. Test of direct and indirect effects of M3 as a mediating variable (Model 3).

Paths		β	95% CI	
			Lower CI	Upper CI
X [1] → M3 [2]		0.362 ***	0.141	0.251
M3 → MB [3]		0.590 ***	0.496	0.679
Direct Effect	X → MB	0.279	−0.014	0.085
Indirect Effect	X → M3 → MB	0.213 ***	0.078	0.153
M3 → IN [4]		0.458 ***	0.361	0.566
Direct Effect	X → IN	0.255	−0.006	0.105
Indirect Effect	X → M3 → IN	0.165 ***	0.058	0.127
M3 → IFN [5]		0.465 ***	0.361	0.559
Direct Effect	X → IFN	0.272 **	0.002	0.109
Indirect Effect	X → M3 → IFN	0.169 ***	0.058	0.126
M3 → SEC [6]		0.467 ***	0.402	0.621
Direct Effect	X → SEC	0.277 **	0.005	0.124
Indirect Effect	X → M3 → SEC	0.169***	0.110	0.231

[1] X—SDD and NDD online shopping frequency. [2] M3—community-organized service activities. [3] MB—membership. [4] IN—influence. [5] IFN—integration and fulfillment of needs. [6] SEC—shared emotional connections. ** $p < 0.05$; *** $p < 0.01$.

Regarding the direct effects of delivery service frequency on the sense of community, the results indicate no significant direct effects on membership (β = 0.279) and influence (β = 0.255), confirming that in Model 3, community-organized service activities (M3) fully mediate the relationship between the frequency of SDD and NDD online shopping and both membership and influence.

Model 3 (Figure 3) indicates that higher frequencies of SDD and NDD online shopping are more likely to strengthen the sense of community through community-organized service activities (M3). These activities, such as neighborhood clean-ups or charity events, actively engage residents in collective actions, fostering a stronger sense of belonging (membership) and influence within the community. The findings suggest that M3 is especially effective in promoting a shared sense of responsibility and participation among residents.

3.2.4. Results of Model 4

Resident-engaged service-oriented activities (M4) involve active participation by residents in community projects, such as organizing local festivals or managing community gardens. Figure 4 illustrates the direct and indirect effects of SDD and NDD online shopping on the four dimensions of the sense of community (SOC) when the resident-engaged service-oriented activities (M4) are used as a mediator. The results indicate that M4 serves as a partial mediator between SDD and NDD online shopping and SOC.

Table 8 presents the model results. First, the frequency of SDD and NDD online shopping has a significant effect on M4 (β = 0.286), suggesting that residents who frequently use these services are more likely to participate in community-oriented activities. Second, M4 has a significant positive effect on all four dimensions of SOC. Notably, in terms of both direct and indirect effects, M4 is similar to M1, showing a significant positive direct impact on SOC, particularly in enhancing shared emotional connection. This suggests that residents who frequently participate in resident-engaged service-oriented activities tend to form stronger emotional bonds with other community members. The frequency of using SDD and NDD online shopping also has significant positive indirect effects on the four dimensions of SOC: membership (β = 0.168), influence (β = 0.142), integration and fulfillment of needs (β = 0.156), and shared emotional connection (β = 0.151).

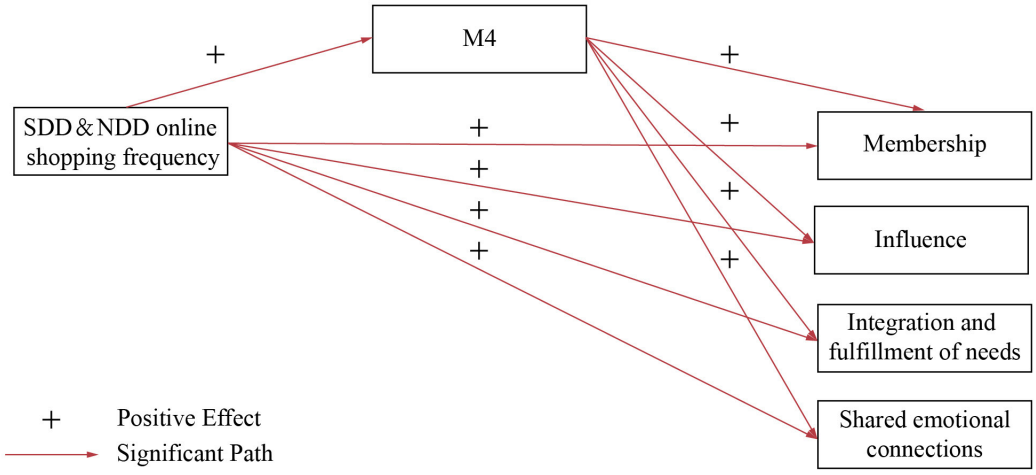

Figure 4. The mediating effect model of M4 (Model 4).

Table 8. Test of direct and indirect effects of M4 as a mediating variable (Model 4).

Paths		β	95% CI	
			Lower CI	Upper CI
X [1] → M4 [2]		0.286 ***	0.104	0.222
M4 → MB [3]		0.588 ***	0.475	0.642
Direct Effect	X → MB	0.279 **	0.012	0.108
Indirect Effect	X → M4 → MB	0.168 ***	0.057	0.125
M4 → IN [4]		0.496 ***	0.083	0.198
Direct Effect	X → IN	0.255 **	0.010	0.115
Indirect Effect	X → M4 → IN	0.142 ***	0.045	0.112
M4 → IFN [5]		0.546 ***	0.428	0.601
Direct Effect	X → IFN	0.272 **	0.013	0.111
Indirect Effect	X → M4 → IFN	0.156 ***	0.050	0.119
M4 → SEC [6]		0.528 ***	0.456	0.650
Direct Effect	X → SEC	0.277 ***	0.020	0.130
Indirect Effect	X → M4 → SEC	0.151 ***	0.056	0.127

[1] X—SDD and NDD online shopping frequency. [2] M4—resident-engaged service-oriented activities. [3] MB—membership. [4] IN—influence. [5] IFN—integration and fulfillment of needs. [6] SEC—shared emotional connections. ** $p < 0.05$; *** $p < 0.01$.

Model 4 suggests that higher frequencies of using SDD and NDD online shopping are associated with a stronger sense of community, facilitated through increased participation in community activities. These activities, such as organizing local cultural festivals or managing community gardens, encourage direct involvement from residents, fostering deeper emotional connections and fulfilling collective needs. Unlike M1 and M3, in Model 4 (Figure 4), M4 provides a more grassroots approach, allowing residents to take an active leadership role, which significantly enhances shared emotional connections and overall SOC.

4. Discussion

This study aims to clarify how the increasingly prevalent lifestyle of online shopping, particularly same-day delivery (SDD) and next-day delivery (NDD) services, affects the sense of community (SOC) through the mediation of various community activities. In the context of large, modern cities, where digital and virtual interactions have become ubiquitous and irreversible, it is crucial to understand how these evolving patterns of daily life can be leveraged to strengthen, rather than diminish, social cohesion. Instead of viewing online shopping as a potential driver of social isolation, this study explores how it can be integrated into a framework that promotes community engagement and enhances SOC.

Our study demonstrates that SDD and NDD online shopping significantly influences SOC through multiple mediating social mechanisms at both the individual and community levels. Informal social gatherings (like unplanned and stronger interpersonal interactions) and organized community events (such as community-organized and resident-engaged activities) serve as key mediators, but their effects vary in strength and scope. While informal, casual interactions partially mediate the relationship between online shopping and SOC, more structured community activities show either full or partial mediation, depending on the SOC dimension. These insights highlight the nuanced ways in which digital commerce can impact community dynamics, offering valuable implications for urban planning and community development. This finding aligns with studies that suggest SDD and NDD online shopping can increase social gatherings with neighbors while also showing complex effects on community vitality and social cohesion [13,15]. The following sections discuss these mechanisms and their broader implications.

4.1. The Effects of Online Shopping on Sense of Community Mediated by Informal Social Gatherings

The convenience and time-saving aspects of SDD and NDD online shopping allow residents to engage more frequently in informal social gatherings, thus enhancing their SOC. However, the impact of these informal social interactions varies based on their nature and intensity. Some studies have explored the mediating role of online shopping attitudes in the relationship between sociodemographic factors and channel choice [38]. Our study further reveals that under shopping channels represented by SDD and NDD online shopping, different types of informal social gatherings have distinct roles in fostering SOC.

First, SDD and NDD online shopping reduces the time spent on traditional shopping, creating more opportunities for residents to engage in spontaneous, low-threshold social interactions, such as chance encounters, greetings, and brief conversations with neighbors. While these interactions contribute to SOC by increasing social encounters, their emotional and social depth is relatively limited [15,39]. Consequently, these informal social gatherings (M1) act as partial mediators between online shopping frequency and SOC, enhancing SOC, but not as strongly as more structured or planned activities. The results emphasize the critical role of SOC in promoting well-being and demonstrate how new shopping behaviors can influence, though not directly cause, changes in community relationships [40,41].

However, some scholars argue that we may be overestimating the influence of online shopping on residents' daily lives and their sense of community. Research has shown that online shopping can negatively impact shopping in physical stores, potentially reducing social connections [17,42]. Moreover, while online shopping may save time, the assumption that this saved time will be redirected into meaningful social interactions is not always valid [43]. This suggests that the relationship between online shopping and SOC is more complex than previously thought, and its effects, particularly at the individual level, may be weaker than initially anticipated.

Second, beyond in-person interactions, online shopping can foster SOC through online community building. Digital interactions—such as exchanging product reviews, providing feedback, and communicating with local businesses and neighbors—can transition into real-world social engagements, reinforcing community bonds and a sense of community [6,7,44]. However, the mediating effects of these informal social gatherings differ. While unplanned interactions (M1) provide partial mediation across all SOC dimensions, stronger, more organized interactions (M2), like resident-led activities, offer full mediation. This indicates that the depth of social links, rather than mere frequency, is critical in enhancing SOC. Moreover, as emphasized by Cao [45], geographic factors, such as the proximity to physical stores and the distribution of online shopping options, play a pivotal role in shaping individuals' preferences for online shopping versus in-store visits. These geographic influences are particularly relevant to personal-level social activities, as they affect how residents allocate their time between virtual shopping experiences and physical community interactions [40,41,43]. Thus, while digital platforms can promote community

building, the physical context and accessibility of local shopping options remain significant in determining the extent and nature of residents' engagement in social activities.

Notably, our study reveals significant differences in the mediating effects of various social activities within informal social gatherings. Stronger interactions (M2), such as resident-organized gatherings and activities, demonstrate a full mediation effect in the model and have positive and significant indirect effects on all four dimensions of SOC—membership, influence, integration and fulfillment of needs, and shared emotional connection. In contrast, M1 partially mediates the relationship between online shopping and all four dimensions of SOC. The weaker impact of M1, such as casual greetings, compared to M2, like resident-organized events, can be explained by their lower emotional and social engagement. According to previous studies [24,32,46], M1 interactions are often brief and superficial, lacking the depth needed to build stronger social bonds. In contrast, M2 interactions involve more deliberate engagement, promoting deeper connections and meaningful exchanges among residents. This suggests that SDD and NDD online shopping can enhance SOC, particularly through facilitating more substantial social interactions.

Overall, at the individual level, SDD and NDD online shopping offers opportunities for interactions that enhance social connections within the community. By transforming routine transactions into social interactions, residents can build informal relationships, contributing to a stronger SOC. These findings emphasize the potential of online shopping to foster social engagement and community building, depending on the nature of the interactions.

4.2. The Effects of Online Shopping on Sense of Community Mediated by Organized Community Events

Organized community events provide another crucial pathway through which SDD and NDD online shopping influences SOC. These events create structured opportunities for collective action and group interactions, fostering trust and social bonds among residents. The study identifies distinct differences in the mediating effects of two types of organized community events.

First, integrating online shopping with organized community events can effectively enhance SOC. Some studies suggest that community managers and urban planners can capitalize on the online shopping trend by organizing events that bridge digital and offline engagements [24,47]. Events such as charity drives, clean-ups, or cultural festivals not only encourage resident participation but also foster a shared sense of purpose and belonging. According to the existing evidence, by offering structured environments for collaboration, these activities are instrumental in enhancing social cohesion [12,14]. It is essential to recognize that it is the act of participating in these community events—rather than the online shopping itself—that primarily drives the enhancement of the sense of community. Online shopping, by increasing convenience and saving time, can facilitate participation in these activities, but it is the act of engaging in community events that truly strengthens social cohesion. Existing evidence suggests that the increased interaction and cooperation fostered through such activities build trust, shared experiences, and a sense of belonging [12,47]. Thus, the influence of online shopping on SOC is indirect and works through the social opportunities it enables.

Second, our study finds that community-organized service activities (M3) fully mediate the relationship between online shopping and abstract SOC dimensions, such as membership and influence. This suggests that M3-type activities are effective in promoting a sense of belonging and perceived influence within the community. Activities such as neighborhood clean-ups or charity drives effectively foster a sense of belonging and perceived influence by creating opportunities for residents to contribute to the community, enhancing their identification with it and their sense of having a voice in community matters [14,48]. However, M3 only partially mediates dimensions like integration and fulfillment of needs and shared emotional connection. In contrast, resident-engaged service-oriented activities (M4), involving more direct and grassroots engagement, provide a more comprehensive

impact on these dimensions. The active involvement of residents in organizing and leading activities fosters deeper emotional bonds and fulfills collective needs.

At the community level, SDD and NDD online shopping can also foster collective efforts such as community group buying, which further facilitates trust and social cohesion among neighbors. Digital platforms that enable community discussions, shared decision-making, and information exchanges play a pivotal role in linking online shopping behaviors to offline community participation [26,49]. However, there is also evidence suggesting that the effect of online shopping on social cohesion may not always be positive. In some cases, the convenience of digital commerce may reduce localized in-person interactions, such as shopping at local stores or participating in community markets [11,50]. This reliance on online shopping could inadvertently weaken the traditional social fabric by reducing the frequency of these face-to-face engagements, which have long supported the development of a strong sense of community. Therefore, while online shopping has the potential to complement and enhance community-building efforts, its ability to undermine them should not be overlooked.

In conclusion, while both informal social gatherings and organized community events mediated by SDD and NDD online shopping contribute to SOC, the effectiveness of these interactions depends on their nature and depth. While informal interactions may occur more spontaneously, organized events allow for deeper engagement and a more structured environment for community building. By distinguishing between these types of activities, our study offers actionable insights for community-level interventions, enabling the design of more targeted and effective strategies to promote resident interaction and a stronger sense of community. Understanding these differences can help urban planners and community developers create more effective strategies to build cohesive and resilient communities through digital commerce.

5. Conclusions

This study demonstrates that same-day-delivery and next-day-delivery online shopping exerts a significant influence on the sense of community by mediating different forms of social activities at both the individual and community levels. The research aimed to investigate how the growing trend of online shopping reshapes social dynamics and impacts community cohesion. Our findings show that online shopping not only facilitates informal social interactions but also supports more structured community activities, both of which are essential for fostering a stronger sense of community. The findings suggest that digital commerce can be strategically leveraged to foster stronger community bonds by encouraging both spontaneous social interactions and planned community engagements. Moreover, location plays a pivotal role in shaping online shopping behavior. Existing research suggests that individuals who primarily shop in urban areas are more likely to frequently engage in online shopping [11]. Given this context, it becomes particularly relevant to examine how online shopping trends impact the sense of community in large urban centers, such as Shanghai.

A key finding is the variation in the impact of online shopping on the sense of community depending on the type and depth of social interactions. While informal gatherings provide partial mediation, more structured interactions, such as community-organized events, fully mediate the relationship between online shopping and the sense of community. This indicates that deeper, more deliberate social connections fostered through resident-organized events have a more substantial effect on social cohesion.

We also found that organized community events and informal social gatherings exert a similar mediating effect in promoting residents' sense of community. Thus, our study confirms the effectiveness of both types of community-led social activities in enhancing the sense of community among online shoppers. This finding offers valuable guidance for community managers seeking to promote resident interaction and strengthen social ties. Additionally, by distinguishing between different types of social activities, our study

highlights more specific and effective strategies that can be implemented at the community management level.

The novelty of this study lies in its integration of digital commerce within the theoretical framework of the sense of community, an area that has received limited attention. The research expands existing theory by identifying online shopping as a factor influencing both interpersonal relationships and broader community-level social interactions. Practically, this study offers insights for policymakers and urban planners, indicating that digital platforms can be leveraged to enhance community cohesion and social resilience. The findings have important implications for designing community initiatives that capitalize on the growing digital economy to foster social well-being.

However, this study has several limitations that future research should address. First, the focus on same-day and next-day delivery services may not capture the full spectrum of digital commerce's impact on community dynamics. Future research should explore the effects of different shopping channels, such as social commerce, online marketplaces, and subscription services, to understand their unique impacts on community dynamics. Second, the cross-sectional design of this study limits the ability to draw causal inferences. Longitudinal studies would provide stronger evidence on how these relationships evolve over time as digital and social environments shift. Finally, future studies should investigate these dynamics across various geographic and cultural settings to enhance the applicability of the results.

Overall, this study provides a foundation for further exploration of how various online shopping and digital engagement channels can be optimized to enhance community cohesion and resilience.

Supplementary Materials: The following supporting information can be downloaded at https://www.mdpi.com/article/10.3390/buildings14113362/s1, including the original questionnaire titled "Supplementary Materials S1 Online Shopping and Sense of Community Survey Questionnaire".

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