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Associations between Community Parks and Social Interactions in Master-Planned Estates in Sydney, Australia

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Abstract: There have been growing concerns regarding increased social isolation in Australia, many of which are currently being exacerbated due to the COVID-19 pandemic. Feelings of social isolation may increase the risk of mental issues in people. New Urbanism hypothesizes that neighborhood communal spaces can influence social interaction between residents and, in turn, can promote community sustainability. This study investigated the associations between community parks and social interactions in master-planned estates (MPEs) in Sydney, Australia. Data were obtained from a resident survey conducted in two MPEs in the inner west area of Sydney: Breakfast Point and Liberty Grove (n = 192). Hierarchical multiple regression (HMR) models were used to analyze the relationship between community park use and social interaction. This study found that the factors 'frequency of community park use', 'rest spaces satisfaction', and 'pedestrian connectivity with surroundings' are significantly and positively associated with social interaction between residents in the MPE context. The findings of this study highlight the importance of the community parks in creating social sustainability in MPEs, particularly in the context of COVID-19 pandemic.

Keywords: social interaction; community parks; master-planned estates; new urbanism; community sustainability

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1. Introduction

The COVID-19 pandemic has significantly increased social isolation and loneliness in Australia. In recent years, many people have reported feelings of isolation in Australia [1]. Studies have shown that feelings of isolation are correlated with psychological distress [2,3] and that social connectedness is 'an important contributor to residents' health and wellbeing' [3] (p. 1). At the neighborhood level, the decline in social interaction between residents has become increasingly concerning, particularly in the inner city areas of Australia [3]. Neighborhood open spaces, such as community parks, may contribute to resident well-being by creating opportunities for social contact [4,5]. Studying how the neighborhood open spaces are associated with social interaction between residents and their well-being has become increasingly needed [6,7]. This paper explores two key areas in this scope: (1) sustainable residential developments: master-planned estates (MPE); (2) social sustainability from the New Urbanism perspective.

In recent decades, MPEs have become significantly more popular in Australian cities [8,9]. MPEs are regarded as sustainable residential developments that contains a 'sustain diverse, complex and dynamic form of sociability, interaction and community dynamics' [10] (p. 34). From the New Urbanism perspective, MPEs provide physical and social infrastructure to address sustainability issues, such as social isolation and a declining sense of community [11–14]. The sustainability and design of public space is a major theme in MPE research [15]. Public space such as parks offer many ecosystem services which contributes to resident well-being [16]. Few studies have explored the relationship between physical public green space and social interaction in MPEs in the Australian context empirically [13,14,17].

MPEs in Australia are aimed to offer lifestyle and a sense of community to the market [15,18]. However, Dowling et al. (2010) claimed that 'we know very little about the lifestyles, community forms and ways of living in MPEs' in the Australian context [19] (p. 391). Specifically, MPEs are targeted to create social cohesion and sense of community for residents through the design of the physical built environment such as well-planned parks, amenities and facilities [18]. Tewari and Beynon (2018) asserted that MPEs' 'neighborhood character of a place is a complex mechanism' (p. 456) which involves an understanding of the relationship between the physical features and the social aspects of MPEs [18]. Yet, few studies have explored the relationship between social interaction alongside its physical attributes in MPEs in the Australian context [13,14,17]. This study may contribute to filling these gaps by focusing on the social aspects in parallel with its physical aspects of community parks in MPEs.

Australian scholars claim that there is a lack of comparative empirical research in the MPE literature [15,17]. Researchers argue that MPE can be regarded as a mechanism for creating social distinction and socio-spatial segregation [15,19]. Some studies show how social distinction and exclusivity are important to residents' motivations to move to a MPE [20,21]. Some other scholars argue that the MPEs are diverse in terms of residents' social and economic status [15,19]. Dowling et al. (2010) suggested the necessity for more research focusing on the diversity of MPEs [19]. This study provides empirical evidence may help to understand some of the complexity of socio-spatial diversity in MPEs.

In Australia, MPEs have become increasingly important and the dominant form of residential housing in major cities, such as Sydney in recent decades [9,10]. As social and economic features in different regions are segmented in Sydney, it is critical to examine MPE from a submarket perspective [10,22]. Bangura and Lee (2022) argued that there are some significant divergences in the social-economic features and housing submarkets across five regions in Sydney: 'western region, inner-west region, southern region, eastern region, northern region' [22] (p. 147). They also pointed out that 'the local government areas in western, inner-west and southern regions of Greater Sydney generally have an Index of Relative Socio-Economic Advantage and Disadvantage below the average index for the city, while the northern and eastern regions reveal contrary the opposite results' [22] (p. 147). This study looks at MPEs in the inner west region of Sydney. We chose two MPEs which are both from the inner west region submarket of Sydney with similar Socio-Economic Indexes for Areas (SEIFA) scores (Australian Bureau of Statistics, 2016) [23] at the area-level. The findings could be generalized to similar submarkets in Sydney but may also have a wider applicability.

Specifically, this study focuses on social sustainability in the MPE context from the New Urbanism perspective. New Urbanism contributes to sustainable development in terms of both environmental and social sustainability through social interaction, neighborhood attachment, and a sense of community. Based on a socio-ecological theoretical framework, this study aims to examine the relationship between the built environment and social sustainability in MPEs, using survey data collected from two MPEs in Sydney in 2021.

2. Literature Review

2.1. New Urbanism and Sustainable Development

New Urbanism is an urban design philosophy that is oriented at achieving social goals, such as community sustainability, social equity, and the common good, through the design of the physical built environment [24–26]. At the neighborhood level, scholars claim that there are several physical design characteristics of neighborhoods that can influence community sustainability, such as being 'well defined, mixed use, pedestrian friendly design, high density and integrated networks of public space' [27] (p. 28).

New Urbanism contributes to MPEs by offering a model of sustainable development in terms of both environmental and social sustainability. In the context of MPEs, the main environmental sustainability focus is 'the impact that human behavior has on the bio-physical world' [28] (p. 436), including land use, transportation, the built environment, the quality of water and air, etc. Social sustainability highlights that an MPE is 'socially mediated and has societal implications' [28] (p. 436), including social interaction, neighborhood pride, and community participation [28–31]. A number of empirical studies supporting New Urbanism claim that physical design can promote greater social interaction and community sustainability [25,32]. Some studies have tested the principles and claims of New Urbanism at the neighborhood level in the Australian context [2,33]. For example, Hooper et al. (2020) [2] tested the impacts of an Australian New Urbanism planning policy on sense of community and resident mental health within neighborhoods in Perth, Australia. They found that complying with the principles of New Urbanism can promote a higher sense of community and can reduce psychological distress. Francis et.al. (2012) [33] examined the relationships between public open space, sense of community, and social interaction in MPEs in Australia and found that the quality of public open spaces appears to be strongly associated with sense of community and the social well-being of residents.

2.2. Master-Planned Estates

MPEs are defined as 'large scale, integrated housing developments produced by single development entities that include the provision of physical and social infrastructure' [13] (p. 186). The essential features of MPEs include a 'definable boundary; a consistent, but not necessarily uniform character' [34] (p. 376).

Australian MPE research often focuses on three prominent themes: (1) the community; (2) governance mechanisms; and (3) the housing market [9,10,17]. Community is an important theme in the MPE literature, including social interaction, neighborhood attachment, and sense of community [17,20]. Johnson (2010) [34] asserted that as large-scale developments, MPEs 'involve comprehensive planning, separateness and concerted efforts to create 'community' (p. 376). Alidoust and Bosman (2017) [31] conducted a qualitative study of MPEs in Queensland, Australia. Their research revealed that MPEs played an essential role in providing opportunities for creating social contacts and for creating social ties among residents. However, it is still not clear what built environment factors promote social interaction and a sense of community in the residents living within MPEs.

2.3. Neighborhood Community Parks

Community parks are important communal spaces in which MPE residents maintain their social lives [30]. A neighborhood communal space is defined as 'a public or semi-public space located within a neighborhood for shared use by local residents' [35] (p. 169). Zhu and Fu (2017) [35] concluded that communal spaces include several types of spaces, including 'streets/sidewalks, clubhouses, consumer sites (e.g., shops, cafes, restaurants), fitness amenities (e.g., basketball courts, tennis courts, swimming pools), and open space (e.g., parks, gardens, lakes, squares)' (p. 169). Previous studies have found that neighborhood communal open spaces, such as playgrounds and parks, provide venues and a variety of opportunities for social interaction [27,31,36].

Based on the theories of New Urbanism, Talen (2000) [37] presented a translating model depicting the relationship between public open space and social interaction. Talen recognized that the 'quality of park space' and 'need of park use' influenced social interaction. Following Talen's model, previous studies identified two components of community park use that could affect social interaction: 'frequency of park use' and 'satisfaction with park quality' [33,35,38].

The findings from previous studies on the impact of 'frequency of park use' on social interaction between residents and their sense of community are inconsistent. Zhu and Fu (2017) [35] found that 'frequency of park use' has a significant and positive impact on social capital and community attachment. In contrast, Francis et al. (2012) [33] identified that 'frequency of public space use' has less of impact on sense of community. Centers and Gómez (2019) [38] revealed that there was no significant correlation between 'frequency of park use' and sense of community.

Meanwhile, previous studies have identified that 'satisfaction with quality of public space' has a significant impact on social interaction and sense of community [33,38]. Zhu and Fu (2017) [35] reported that residents who had a higher level of satisfaction with the quality of communal space had a higher level of social capital and community attachment. The Australian 'Classification Framework for Public Open Space' identified three primary types of function for spaces in neighborhood open space: recreation, sport, and nature [39]. The quality of the recreation, sport and nature function spaces and facilities in parks are associated with the mental health of residents and their social well-being [39].

In summary, as the findings are inconsistent in the literature, there is still uncertainty as to whether 'frequency of park use' is a significant predictor of social interaction. In addition, it is not quite clear what factors of community park quality have significant impacts on residents' social interaction in the MPE context.

2.4. Neighborhood Social Interaction

Neighborhood social interaction is defined as 'a social opportunity in which two or more residents attend to the quality of their relationships' [40] (p. 317). Berkman and Glass (2000) [41] presented a social network system model demonstrating how social interactions occur within a social network system. Social networks are defined as 'the web of social relationships that surround an individual and the characteristics of those ties' [41] (p. 847). In a social network, human relationships consist of multiple layers, including strong ties and weak ties [42]. A social network is essential for providing social support that can, in turn, improve the mental and physical health of residents [30,42,43].

The literature suggests that both the quantity and quality of social interactions can impact resident well-being [44]. First, the quantity of social interaction can be examined via measuring the frequency of different types of social interaction: informal interaction and formal interaction. Informal casual interactions include brief conversations or waving to greet others and are usually based on informal relationships with people to whom an individual has weak social ties [7,43]. Formal interactions are often based on close relationships between friends and family and from strong social ties in the neighborhood [7]. Previous studies found that the interactions between people with weak social ties among neighbors are associated with better mental health in neighborhoods [42,45]. Hickman (2013) [46] found that residents value seeing friendly faces or seeing other people in neighborhood communal spaces. Secondly, the quality of social interaction can be investigated via measuring how many people in an individual's social network are based on weak or strong social ties [7,42,44]. The literature implies that the quality of social interaction is important and contributes more to social well-being than it does to the quantity of social activities [44].

Social-ecological theory recognizes that a range of factors could directly or indirectly effect neighborhood social interaction and well-being, including personal factors (such as age, gender, education, and length of residence), social factors (such as neighborhood safety and group participation), and physical factors (such as neighborhood parks) [5,33].

This study was conducted based on the socio-ecological theoretical and conceptual framework shown in Figure 1 [33]. The conceptual model for this study consists of three sections: (1) the first section includes demographic, individual and social factors; (2) the second section incorporates community park use (CPU) factors; (3) the third section refers to social interaction (SI) factors (dependent variable). As discussed above, the literature suggests that community parks have an effect on the social interaction that takes place between residents through two aspects: 'frequency of park use' and 'satisfaction with park quality' [33,35]. One of the specific objectives of this study was to investigate the extent to which the factors 'frequency of park use' and 'satisfaction with park quality' can significantly influence social interaction between residents in MPEs. To achieve this research objective, two hypotheses were proposed:

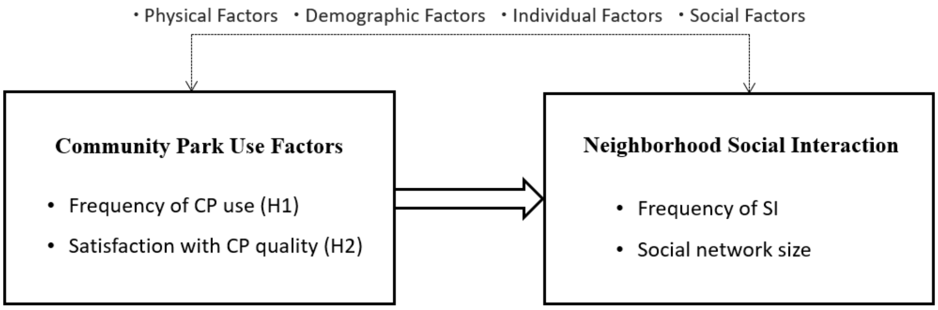

Figure 1. Conceptual framework of community park use and social interaction. Note. CP = community park; SI = social interaction.

Hypothesis 1 (H1). *Frequency of community park use is significantly and positively associated with social interaction between residents.*

Hypothesis 2 (H2). *Satisfaction with community park quality is significantly and positively associated with social interaction between residents.*

3. Materials and Methods

3.1. Targeted Neighborhoods

There are three types of MPEs, the categories of which can be determined based on their form: open, symbolically enclosed, and gated [19]. In this study, two MPEs in the inner west area of Sydney were chosen: Breakfast Point and Liberty Grove. There are some similarities between the two cases: (1) the two MPEs are located in the same area, both in the City of Canada Bay Council of Sydney; (2) the two MPEs were both built around the year 2000; (3) both are large-sized MPEs with more than 500 properties (2110 dwellings in Breakfast Point and 801 dwellings in Liberty Grove) [23]. As suggested by Kenna et al. (2017) [8], the standard sizes of planned residential estates can be categorized based on the following criteria: (1) large-scale = 500+ properties; (2) medium-scale = 50–500 properties; (3) small-scale = under 50 properties (p. 273).

The two cases have different built forms. The first case, Breakfast Point, is an open MPE. The second case, Liberty Grove, is looked as a gated MPE with physical wall boundaries and exclusive gates [47]. Breakfast Point could be regarded as a representative for New Urbanism-based MPEs [48], having features such as a well-defined center and edges, mixed-use land use and housing types, a compact density, being pedestrian-dominated, and having integrated parks that are connected to the surrounding areas of the MPE [27]. Liberty Grove is more enclosed, has a well-defined clear center and edges, a compact density and mixed housing types [47]. Both MPEs have integrated networks of parks with high-quality nature, recreational and sporting amenities [47,48].

3.2. Data Collection

Within the framework of the case study, a resident survey was conducted to collect data from the residents living in Breakfast Point and Liberty Grove from May to December 2021. To be eligible, the survey participants needed to (1) be older than 20 years old, (2) live in Breakfast Point or Liberty Grove, and (3) be able to speak English. The total targeted population (over 20 years of age) comprised 5140 between the two areas: 3475 in Breakfast Point and 1165 in Liberty Grove [23]. Sampling was used at a 95% confidence level with a 7% acceptable sampling error (which is commonly used in social research) [49]. When the relevant information was provided, a sampling calculator (provided by Creative Research Systems) calculated the total sample size needing to be at least 189.

A pilot survey using a face-to-face approach was conducted in Breakfast Point and Liberty Grove in April 2021 before the main survey was carried out (n = 8). The specific objectives of the pilot survey were to make sure that the questionnaire was easy to understand; to test the likely residents' responses; and to test the data collection methods and the response rate. In total, eight residents in Breakfast Point and Liberty Grove participated in the pilot survey. The results of the pilot study showed that the survey questionnaire was feasible and acceptable to the residents from the two MPEs who participated. The response rate (response rate = 80%) was high in the face-to-face pilot survey.

Subsequent to the pilot study, the main survey was conducted to collect data from residents living in the Breakfast Point and Liberty Grove MPEs from May to December 2021. The main survey used a mixed approach to collect data via in-person and online distribution methods. The ratio of in-person and online responses was determined by COVID-19 restrictions. As a result, 9 responses (not including pilot data) were collected via face-to-face surveys (response rate = 77%), and 183 responses were collected from an online survey carried out using the online survey tool 'Qualtrics'. The online survey was distributed by means of two methods during the COVID-19 period: Method (1) was via mailboxes. A total of 160 survey letters were delivered. Each letter included an explanation of the purpose of the study, a link to the online survey, and a QR code to the survey. The households were selected using random walk sampling [50]. Specifically, we distributed the survey letters at a random geographic point and followed a specified path in the neighborhood to select the household addresses and to distribute the survey letter into the mailboxes. Method (2) was via social media groups. The survey invitation letter with the survey link and QR code were posted to the closed neighborhood social media groups (e.g., Facebook, WeChat). A total of 192 responses were returned, including 97 responses from Breakfast Point and 95 responses from Liberty Grove.

3.3. Measures

3.3.1. Social Interaction (SI)

Social interaction was measured using a five-level Likert-type scale presented by previous studies to assess both the quantity and quality of neighborhood social interaction in the Australian context [7,11]. The quantity of social interaction was investigated via measuring how often the residents interacted with neighbors via two types of social interactions: informal interaction with weak-ties and formal interaction with strong-ties [7,11], which was evaluated using questions such as 'How often do you have general interactions with your neighbors (e.g., short-duration outdoor talks, greetings) in Breakfast Point/Liberty Grove?' (1 = never, 2 = less than once a month, 3 = 2–3 times a month, 4 = 1–6 times a week, 5 = daily). The quality of social interaction investigated the size of each residents' social network via measuring the number of people in their social network that the resident had strong ties and weak ties with, through questions such as 'How many of your neighbors do you like to stop and chat with when you run into them in the neighborhood?' (1 = 0, 2 = 1–2, 3 = 3–5, 4 = 6–10, 5 = $\geq$11) [7,42].

3.3.2. Community Park Use (CPU)

Community Park Use factors were measured by the Community Park Use (CPU) scale, which consisted of one 'frequency of community park use' item and eight 'satisfaction with park quality' items.

'Frequency of community park use' was measured by asking participants how often they used these parks. The 'frequency of CP use' data ranged from 'never' to 'daily' (1 = never, 2 = less than once a month, 3 = 2–3 times a month, 4 = 1–6 times a week, 5 = daily). This study defines park users by dividing them into two groups: 'frequent park-users' and 'infrequent park-users'. A 'frequent park-user' is defined as a resident who uses the community parks at least once a week, and an 'infrequent park-user' refers to the residents who use community parks less than once a week [33].

'Satisfaction with park quality' was investigated by measuring residents' subjective evaluation of their satisfaction with eight physical attributes of community parks: S1—Recreation space, S2—children's playgrounds, S3—rest space, S4—shade space, S5—sporting space, S6—nature space, S7—pedestrian accessibility, and S8—pedestrian connectivity with surroundings. Satisfaction questions were coded from 1 = very dissatisfied to 5 = very satisfied. The eight items that were used to determine park space quality were developed based on an Australian planning model 'Classification Framework for Public Open Space' [39] and on previous studies [33,35].

3.3.3. Demographic, Individual, and Social Variables

Based on the theoretical framework (socio-ecological framework) of this study, several demographic, individual, and social factors were included [33,36]. First, certain demographic and individual factors with an influence on social interaction in the neighborhood context, including categorical variables: gender, age, marital status, work status, education, and homeownership and quantitative variables: family size (from 1 to $\geq$5), children $\leq$ 18 living at home (from 0 to $\geq$4), income (1 = <AUD 20,000, 2 = AUD 20,000–49,999, 3 = AUD 50,000–99,999, 4 = AUD 100,000–199,999, 5 = $\geq$AUD 200,000), and length of residency (1 = $\leq$one year, 2 = 1–3 years, 3 = 3–5 years, 4 = 5–10 years and 5 = $\geq$10 years), were determined from the literature [51].

Online social interaction could affect the relationship between park use and neighborhood social interaction as a confounding variable. To control the influence of online interaction, this study measured the residents' online interactions as a control variable via question items such as 'How often do you interact with your neighbors on online social networking sites, such as Facebook?' (1 = never, 2 = $\leq$once a month, 3 = 2–3 times a month, 4 = 1–6 times a week, 5 = daily) [52] and 'I prefer communicating with neighbors face-to-face rather than online when I feel isolated', which were coded from 1 = strongly disagree to 5 = strongly agree [52].

Social factors included 'neighborhood safety' [51] and 'group participation' [33]. Neighborhood safety was measured by asking whether the participants felt safe living in Breakfast Point or Liberty Grove. Group participation was measured by asking how often the participant participated in neighborhood groups and activities (e.g., service, cultural, sport or recreation groups) in Breakfast Point/Liberty Grove over the past year as a dummy variable (1 = no, 2 = yes, $\geq$1 groups).

4. Results

The reliability was estimated using Cronbach alphas on SI and CPU scales, respectively. The Cronbach's coefficient value (α) of the SI scale was 0.741, and the Cronbach's coefficient value (α) for the CPU scale was 0.774. The Cronbach's coefficients of the two scales were both larger than 0.7, meaning that the two scales are reliable [53].

Before data analysis, SPSS was used to check for missing data, with data loss of less than 10% being determined. A Little's MCAR test showed that the data were missing at random (Chi-squared = 20.554, DF = 27, Sig. = 0.807) [54]. The item 'children's playground satisfaction' had 17 missing responses (missing at 8.9%); 'income' had 14 missing responses (missing at 7.3%); 'work status' had 6 missing responses (missing at 3.1%); 'rest space satisfaction', 'sporting space satisfaction', and 'education' all had 2 missing data (missing at 1%); and 'shade space satisfaction' had 1 missing responses (missing at 0.5%). Cheema (2014) [55] indicated that mean imputation should work well if the percentage of missing data is less than 10% at random. Hence, this study used the mean imputation technique to handle the missing data.

4.1. Descriptive Statistics

Overall, out of 192 respondents surveyed, 50.5% were from Breakfast Point (n = 97) and 49.5% were from Liberty Grove (n = 95). Around half of the respondents were female (57.3%), and over half of them were married (64.1%). The majority of the respondents (90.6%) were under the age of 60: respondents who were aged 20–39 years old (54.2%) represented the largest group, while 36.5% of the respondents were aged 40–59 years old. Most of the respondents were employed full time (63.5%), and over half of the respondents (66.7%) owned homes in the two MPEs. Educationally, most respondents had a bachelor's degree (42.7%), with the next largest proportion having a master's degree (19.8%). Most of residents had an annual income (60.9%) is in the range of AUD 50,000-AUD 199,999. Over half of the respondents (55.2%) indicated that they had participated in one or more neighborhood groups. On average, half of the respondents (50%) stated that they had lived in their neighborhood for 3–10 years, and 30.2% respondents stated that they had lived there for more than 10 years. The descriptive statistics of the sample used in this study are summarized in Table 1.

Table 1. Descriptive statistics (N = 192).

Item	%	n	Mean	Std. Deviation	Pearson Correlation [a]
Demographic, individual, social factors					
MPE (Liberty Grove)	49.5%	95			
Gender (Female)	57.3%	110			
Age					
Age 20–39	54.2%	104			
Age 40–59	36.5%	70			
Age 60–79	8.9%	17			
Over 80	0.5%	1			
Marital status (Married)	64.1%	123			
Work status					
Full Time	63.5%	122			
Part Time	18.2%	35			
Self-employed	4.7%	9			
Unemployed	2.1%	4			
Retire	8.3%	16			
Education					
High school	4.1%	8			
Diploma	15.5%	30			
Bachelor	42.5%	82			
Master	20.2%	39			
Doctor	16.6%	32			
Homeownership (Owning)	66.7%	128			
House type					
House	30.7%	59			
Townhouse	18.2%	35			
Apartment	51.0%	98			
Groups participation (≥1 Group)	55.2%	106			
Family size			3.10	1.243	
How many children at home			1.80	0.907	
Income			3.20	0.935	
Length of residency			3.65	1.184	
Online interaction frequency			3.27	1.341	
Prefer face-to-face interaction			3.46	1.087	
Neighborhood safety			3.90	1.097	
CPU					
C1: Frequency of CP use [b]			3.67	1.029	0.229 ***
C2: Pedestrian accessibility to nearest park [c]			3.70	1.237	0.084
C3: Recreation space satisfaction [c]			3.77	1.038	0.072
C4: Children playground satisfaction [c]			3.35	1.232	0.151 *
C5: Rest space satisfaction [c]			3.32	1.234	0.229 ***
C6: Shade space satisfaction			3.66	1.137	0.226 ***
C7: Sporting space satisfaction [c]			3.59	1.180	0.123
C8: Nature space satisfaction [c]			3.91	1.201	0.060
C9: Pedestrian connectivity with surroundings [c]			3.70	1.141	0.214 ***

[a] Dependent Variable: Social Interaction. [b] Frequency questions, Likert-scale coded from 1 = never to 5 = daily. [c] Satisfaction questions, Likert-scale coded from 1 = very dissatisfied to 5 = very satisfied. * $p < 0.05$, *** $p < 0.001$.

4.2. Principal Component Analysis of SI Scale

First, before further analysis, Exploratory Factor Analysis was used to uncover the underlying structure of the SI scale. Principal component analysis (PCA) via SPSS was used as the factor analysis extraction method implemented to test the underlying dimensions of the SI scale. The literature suggested that the total variance that could be explained by all of the principal components should be from 70% to 80% [56]. The number of principal components was then the k smallest value that this chosen percentage exceeded.

In combination with the analysis of the theoretical basis [41], three principal components were extracted and interpreted from the SI scale: (1) quantity of strong-tie social interaction, (2) quality of social interaction (social network size), and (3) quantity of weak-tie social interaction. The three components explained the 79.67% variance in social interaction. The presence of three principal components explains 49.18%, 16.98%, and 13.51% of the variance, respectively (see Table 2). The rotated component matrix results shows that all the standardized factor loadings (λ) exceed 0.6, as shown in Table 2. This means that the scale has a high convergent validity [57].

Table 2. Principal components extracted of SI scale.

Items	Component		
	1	2	3
Community activities frequency	0.859		
Together activities frequency	0.822		
General friends		0.881	
Close friends		0.726	
General interaction frequency			0.957
Eigenvalues	2.459	0.849	0.676
Cumulative variance explained (%)	49.178	16.987	13.510

Rotation Method: Varimax with Kaiser Normalization.

4.3. Correlation Analysis

A Pearson correlation analysis was conducted to investigate whether there were significant relationships between the following variables: (1) the CPU factors and (2) the dependent variable: social interaction. The main purpose of the correlation analysis was to selectively screen the independent variables for further regression analysis. As shown in Table 1, the correlation analysis results show significant correlations between the demographic level factors, the CPU factors, and the social interaction variable.

Correlation analysis identified that the five CPU factors were positively correlated with social interaction. The strongest associations with social interaction came from 'frequency of CP use' (r = 0.229, p = 0.001) and 'rest space satisfaction' (r = 0.229, p = 0.001), followed by 'shade space satisfaction' (r = 0.226, p = 0.002), 'pedestrian connectivity with surroundings' (r = 0.214, p = 0.003), and 'children's playground satisfaction' (r = 0.151, p= 0.036). As a result, these factors that were determined to be significantly correlated with social interaction were entered as independent variables in a further regression analysis.

4.4. Hierarchical Multiple Regression Analysis

This study employed a hierarchical multiple regression (HMR) analysis approach to examine the associations of the CPU and SI. Before performing HMR, we tested four key assumptions for multiple regression: linearity, homoscedasticity, normality, and multicollinearity. The assumptions were met to complete multiple regression analysis [58].

The main reason behind using HMR was because it allowed us to select the order that the variables could be entered into HMR based on the theoretical considerations [59]. In the HMR models, the degree of a specific factor contributing to social interaction could be seen by the change in the R^2 value [57]. Another reason to use HMR is because there is a hierarchical relationship that exists among the factors that affect resident social interaction. At first, the socio-demographic and individual factors (e.g., gender, age, and work status) affect the frequency at which residents use the park facilities. Following that, community park use frequency could have an influence on how satisfied residents are with the quality of the community parks and could impact social interaction.

In this study, the logical background on the order of variables into the models is based on the socio-ecological theoretical framework [33] shown in Figure 1. According to the theoretical framework, a three-level HMR was performed by adding the independent variables into the models: (1) selected demographic-level factors were entered first; (2) then, the 'frequency of CP use' was entered to examine how it varied in terms of social interaction after the factors in Model 1 had been adjusted; (3) finally, the correlated 'satisfaction' items in the CPU scale were entered after the factors in Model 1 and Model 2 were adjusted.

To identify the significant correlates of social interaction, general linear regression models were used to examine the demographic-level factors (see Table 3). This paper set the categorical variables as dummy variables to ensure the accuracy of the study. It was found that several demographic, individual, and social factors were significantly correlated with social interaction: online interaction frequency ($p < 0.001$), whether the participant was retired ($p = 0.005$), whether the participant preferred face-to-face interaction ($p = 0.013$), group participation ($p = 0.014$), length of residency ($p = 0.018$), whether the participant was married ($p = 0.028$), and being in the age range of 60–79 ($p = 0.037$). Given the impact of these seven demographic-level factors on social interaction, the following HMR models incorporated them as control variables.

Table 3. Regression coefficient of demographic, individual, social factors.

Item	Standardized CoefficientsBeta	Sig.
Liberty Grove (ref = Breakfast Point)	0.052	0.348
Female (ref = male)	0.081	0.209
Age (years) (ref = 20–39)		
40–59	−0.105	0.113
60–79	−0.203	**0.037**
≥80	0.005	0.936
Married (ref = single)	−0.146	**0.028**
Work status (ref = unemployed)		
Full Time	0.155	0.343
Part Time	0.076	0.604
Self-employed	0.133	0.140
Retire	0.366	**0.005**
Education (ref = high school)		
Diploma	0.190	0.371
Bachelor	0.189	0.497
Master	0.191	0.391
Doctor	0.140	0.522
Owning homeownership (ref = renting)	0.233	0.387
House type (ref = apartment)		
House	0.038	0.613
Townhouse	−0.010	0.892
Groups participation (ref = no group participation)	0.165	**0.014**
Family size	0.100	0.171
How many children at home		
Income	0.045	0.543
Length of residency	0.167	**0.018**
Online interaction frequency	0.455	**0.000**
Prefer face-to-face interaction	0.182	**0.013**
Neighborhood safety	0.122	0.107

Note. Dependent variable: Social Interaction. ref = reference category. p-values are bolded if $p \leq 0.05$.

The results of three-level HMR model analysis on social interaction are summarized in Table 4. The R^2 values show that, when the three models were added to the HMR model, the increases in the R^2 values were significant.

Table 4. HMR models of the association between independent variables and Social Interaction [a].

Item	Model 1 [b]			Model 2 [c]			Model 3 [d]		
	B	SE	β	B	SE	β	B	SE	β
Demographic, Individual and Social factors									
Married (ref = single)	−0.237	0.098	−0.131 **	−0.231	0.096	−0.128 **	−0.242	0.094	−0.134 **
Age (years) 60–79 (dummy variable [e])	−0.302	0.258	−0.099	−0.360	0.255	−0.118	−0.293	0.248	−0.096
Retired (dummy variable [f])	0.682	0.267	0.218 **	0.702	0.263	0.224 ***	0.604	0.256	0.193 **
Length of residency	0.135	0.044	0.185 ***	0.143	0.043	0.195 ***	0.133	0.042	0.182 ***
Online interaction frequency	0.278	0.039	0.430 ***	0.266	0.039	0.412 ***	0.279	0.038	0.433 ***
Prefer face-to-face interaction	0.191	0.046	0.239 ***	0.166	0.046	0.209 ***	0.130	0.046	0.163 ***
Groups participation (ref = no group participation)	0.286	0.105	0.165 ***	0.288	0.104	0.165 ***	0.217	0.103	0.125 **
Liberty Grove (ref = Breakfast Point)	0.091	0.097	0.052	0.092	0.095	0.053	0.099	0.093	0.057
CPU factor									
Frequency of CP use				0.123	0.046	0.146 ***	0.115	0.045	0.136 **
Children playground satisfaction							0.027	0.040	0.038
Rest space satisfaction							0.090	0.042	0.128 **
Shade space satisfaction							0.048	0.046	0.063
Pedestrian connectivity with surroundings							0.071	0.042	0.093 *
Model R^2		0.468			0.488			0.532	
ΔR^2		0.468 ***			0.020 ***			0.043 ***	
ΔF		20.160			7.059			4.126	

[a] Dependent Variable: Social Interaction; B = unstandardized coefficients, SE = Std. Error, β = standardized coefficients. [b] Model 1 Predictors: (Constant), Liberty Grove, Online interaction frequency, Retired, Married, Prefer face-to-face interaction, Length of residency, Group participation, Age 60–79. [c] Model 2 Predictors: (Constant), Liberty Grove, Online interaction frequency, Retired, Married, Prefer face-to-face interaction, Length of residency, Group participation, Age 60–79, Frequency of CP use. [d] Model 3 Predictors: (Constant), Liberty Grove, Online interaction frequency, Retired, Married, Prefer face-to-face interaction, Length of residency, Group participation, Age 60–79, Frequency of CP use, Rest space satisfaction, Pedestrian connectivity with surroundings, Children playground satisfaction, Shade space satisfaction. [e] Age (60–79) is dummy variable, 1 represents the participant's age is in 60–79 years group, 0 represents participant's age is in other age groups. [f] Work status (retired) is dummy variable, 1 represents the participant is retired,0 represents participant in other work status groups. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

- Model 1

First, the selected demographic, individual, and social factors were determined to be significantly correlated with social interaction and the MPE (Liberty Grove) factor were entered into the regression analysis in order to control for any variance in social interaction. The HMR model summary shows that in Model 1, the demographic, individual, and social variables explained a significant amount of the 46.8% variance in the social interaction ($R^2 = 0.468$, $p < 0.001$). Specifically, Model 1 revealed that the demographic factors 'retired', 'married', and 'length of residency' and the individual factors 'online interaction frequency' and 'prefer face-to-face interaction', and the social factors 'group participation' significantly associated with SI.

- Model 2

Secondly, to test hypothesis 1: 'frequency of community park use is significantly and positively associated with social interaction between residents', the independent factor of 'frequency of CP use' was added to Model 2. The second model was adjusted for the demographic-level variables to examine the variations in social interaction. This step allowed us to see the degree of the 'frequency of CP use' factor contributing to social interaction by changing the R^2 in the HMR models. In Model 2, when the 'frequency of CP use' factor was added to the HMR model, the increase in the R^2 value was significant over the increase observed in Model 1 (R^2 change = 0.020), and this factor explained the additional 2.0% in the SI variance at the $p < 0.01$ level ($p = 0.009$). The standardized beta weights (β = 0.146) indicate relative 14.6% associations of 'Frequency of CP use' predictor on social interaction and have adjusted for the factors in Model 1.

- Model 3

Thirdly, to test hypothesis 2: 'satisfaction with community park quality is significantly and positively associated with social interaction between residents', four significant CPU factors, 'rest space satisfaction', 'children's playground satisfaction', 'shade space satisfaction', and 'pedestrian connectivity with surroundings', were entered into Model 3 in a separate step and were adjusted based on the demographic, individual, and social variables (Model 1) and the frequency of CP use (Model 2). In Model 3, when the two CPU factors were added to Model 3, Model 3 had an R^2 of 0.043 ($p = 0.003$), which was adjusted based on the values of Model 1 and Model 2, which improved the R^2 by 4.3% over Model 2. The HMR results showed that three the CPU factors were significantly associated with social interaction: frequency of CP use (β = 0.136, $p = 0.012$); rest spaces satisfaction (β = 0.128, $p = 0.035$); and pedestrian connectivity with surroundings (β = 0.093, $p = 0.095$).

In summary, the HMR findings revealed that 'frequency of CP use', 'rest space satisfaction', and 'pedestrian connectivity with surroundings' significantly and positively influenced the residents' social interaction in MPEs.

5. Discussion

Hierarchical multiple regression models revealed that some community park factors were significantly associated with social interaction. The findings indicate the importance of community park use in creating social interaction in MPEs.

5.1. Frequency of Community Park Use

This study found a significant and positive association between the 'frequency of park use' and social interaction in MPEs, which is consistent with the findings of Zhu and Fu's (2017) study [35].

The data analysis showed that two variables 'frequency of park use' and social interaction are significantly correlated, but we cannot say 'frequency of park use' caused changes in social interaction. Other, third confounding variables could have affected the relationships as well. It could be argued that one possible explanation for this result is that visiting community parks may create more opportunities for more social connection. The recreation, sporting, and nature spaces in community parks provide venues for residents to engage in social behaviors, such as participating in activities with friends and community activities, that may create strong social ties. Community parks also could help to shape weak social ties by providing opportunities for general social interactions with weak ties. The literature suggests that people valued and enjoyed seeing friendly faces when they felt socially isolated [46]. These general weak-tie social interactions are helpful and important for the mental well-being of residents in neighborhoods [44].

We were in the midst of the COVID-19 pandemic while conducting the survey. Many people were experiencing feelings of isolation due to the COVID-19 outbreak. We noticed that there is a key difference between the results of this study and those of other studies conducted before the pandemic [33,38], the greatest of which being that the frequency of CP use has a stronger, more significant, and positive correlation with social interaction in this study. One possible explanation is that people have been using and appreciating the neighborhood green spaces around them more than before due to COVID-19. Lockdown may have reinforced the interactions that take place in these spaces and made them stronger, but that there is no evidence that these interactions have resulted in significant changes in peoples' general attitude. Our findings thus highlight the importance of community park use to facilitate social interaction and social capital in MPEs by providing empirical evidence in Sydney.

5.2. Satisfaction with Community Park Quality

This study measured subjective evaluation using eight physical attributes of the recreation, sport, and nature functions of community parks. We found that there are two key factors of community park use that have an effect on social interaction: rest space satisfaction and pedestrian connectivity with surroundings. A reason for rest spaces could be that they provide spaces for residents to engage in social interaction with each other. For example, some general interactions often occur in park rest areas, such as sitting in the park to see other people, waving to greet others, or having brief conversations in the sitting areas. This type of casual interaction allows residents to feel that they are engaging in neighborhood life and, in turn, benefitting their mental well-being [46]. This finding indicated the importance of park rest spaces and facilities for the social well-being of residents.

Another finding is that the pedestrian connectivity that parks have with the areas surrounding them was significantly associated with social interaction between neighbors. This result has supported the New Urbanism claim that 'a range of parks should be distributed within neighborhoods' and 'connect different neighborhoods and districts' [60]. Pedestrian access to surrounding public parks and green spaces provides more opportunities for residents to engage in social behaviors, such as walking and cycling with friends through the parks and seeing and greeting neighbors while travelling between parks. This finding provides empirical evidence to support New Urbanism's claim about community parks in the MPE context.

Observations of the physical environment of the two selected MPEs showed that there are integrated networks of parks with high-quality nature, recreational and sporting amenities in both Breakfast Point and Liberty Grove. The Australian Council for New Urbanism demonstrated that, in Breakfast Point, 'special landscaped places, the waterfront park, central park, the village green, occupy over 25% of the site area, and help theme each residential precinct.' [48] (p. 26). Dowling and McGuirk (2005) [47] mentioned that Liberty Grove 'distinguishes itself as much by its elaborate array of high-quality leisure and recreational amenities' (p.8). The physical environment was a major consideration to choose the two MPEs which may help us to identify why people chose their answers in the questionnaire.

It is possible that people answered depending on their behavior, experiences and model of activities. The integrated community parks provide plenty of spaces to residents for various activities, such as self-oriented and group activities (e.g., 'watch', 'relax', 'play', 'sport', 'walk' and 'attend an event', etc.) [33]. The high-quality parks' rest spaces may provide recreational activity options, such as to sit for relaxation. The parks are also good places for socialization, such as participating in community events or talking with neighbors when they are resting or playing in the parks. Following this survey study, interviews will be conducted to further explore the reasoning behind the residents' perceptions of how the MPE community parks affect their social lives.

5.3. Limitation

The present study has some limitations. First, one of the limitations of this study is that data were collected during the COVID-19 pandemic. The measurements were self-reported, and the situation caused by the COVID-19 pandemic could have possibly influenced the individuals' feelings and responses. As such, there could some self-reporting biases. Secondly, there could two inter-related relationships between the two factors of 'satisfaction with community park quality' and 'frequency of community park use'. The internal relationships between these independent variables were not included in this study and need to be addressed in future research. Thirdly, this study used the mean imputation technique to handle the missing data, something that is heavily critiqued in the literature. Finally, this study only focused on the selected two MPEs in the inner west area of Sydney, limiting the applicability of the findings to other MPEs.

6. Conclusions

This paper explored the sustainable residential MPE developments by focusing on the social well-being of the residents who live there from a New Urbanism perspective. The results show that 'frequency of community park use', 'rest space satisfaction', and 'pedestrian connectivity with surroundings' are significantly and positively associated with social interaction in MPEs. This study makes three main contributions to the literature: (1) it adds empirical evidence to the Australian MPE literature; (2) it empirically contributes to neighborhood social sustainability research; (3) it contributes to the literature on New Urbanism.

First, this study supplements the MPE literature by investigating MPEs in the inner west area of Sydney. MPEs aim to promote sense of community and social wellbeing by offering design, layout and physical/social infrastructures, such as providing more public open space and value-added facilities. The findings help us to understand the relationship between physical space and social interaction within MPEs, particularly focusing on the inner urban areas MPEs.

Second, this empirical study contributes to neighborhood social sustainability research by adding empirical evidence from the MPE perspective. The literature shows that neighborhood social sustainability plays an essential role in the well-being of the residents who live there, but there is a lack of research regarding how neighborhood communal spaces influence social sustainability. This survey study was conducted in the midst of the COVID-19 pandemic. This study could make unique contributions to the social sustainability literature by adding empirical evidence collected under the context of the COVID-19 pandemic in the Australian MPE context. COVID-19 may have reinforced interactions made them stronger. Future research is needed to compare the data collected before, during, and after the pandemic. This study makes a unique contribution by adding evidence collected during the COVID-19 pandemic and that can be used for future studies.

Third, this article empirically tested New Urbanism's claims regarding the environmental sustainability of neighborhood parks in the MPE context. The results imply that community parks are important for promoting neighborhood social sustainability.

The results of this study may provide empirical insights for policymakers, urban planners, and developers for MPE development in Sydney. For policymakers, the findings provide empirical evidence on the use of more community parks in sustainable residential developments to benefit the social wellbeing of the residents. The findings suggest that the quantity and quality of a park's rest facilities and spaces should be promoted. The findings also imply that MPEs should be built in their open form to create good pedestrian connectivity with the surrounding areas and facilitate social interaction between residents. Enhancing social interaction between residents is important in sustainable urban development. When people become social and attached to the place where they live, they care more about others and the environment around them. For urban planners and developers, this study indicates that MPEs are an excellent way to enhance social contact and sense of community among residents. A well-designed MPE with integrated community parks will provide a physical environment to encourage people to interact and, in turn, promote a sense of community in neighborhoods.

Future research should improve the community park quality measurements by including more aspects of park quality. Furthermore, future studies should consider exploring multiple inner urban MPEs and addressing comparisons within and between MPEs with respect to neighborhood communal space, social interaction, and community sustainability.

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References

1. Edwards, B.; Biddle, N.; Gray, M.; Sollis, K. Initial impacts of COVID-19 on mental health in Australia. *ANU Cent. Soc. Res. Methods* **2020**, *10*.
2. Hooper, P.; Foster, S.; Knuiman, M.; Giles-Corti, B. Testing the impact of a planning policy based on New Urbanist planning principles on residents' sense of community and mental health in Perth, Western Australia. *Environ. Behav.* **2020**, *52*, 305–339. [CrossRef]
3. Warner, E.; Andrews, F.J. "Surface acquaintances": Parents' experiences of social connectedness and social capital in Australian high-rise developments. *Health Place* **2019**, *58*, 102165. [CrossRef] [PubMed]
4. Schmidt, T.; Kerr, J.; Schipperijn, J. Associations between neighborhood open space features and walking and social interaction in older adults—a mixed methods study. *Geriatrics* **2019**, *4*, 41. [CrossRef] [PubMed]
5. Lauwers, L.; Leone, M.; Guyot, M.; Pelgrims, I.; Remmen, R.; Van den Broeck, K.; Keune, H.; Bastiaens, H. Exploring how the urban neighborhood environment influences mental well-being using walking interviews. *Health Place* **2021**, *67*, 102497. [CrossRef] [PubMed]
6. Ross, A.; Searle, M. A conceptual model of leisure time physical activity, neighborhood environment, and sense of community. *Environ. Behav.* **2019**, *51*, 749–781. [CrossRef]
7. Abass, Z.I.; Andrews, F.; Tucker, R. Socializing in the suburbs: Relationships between neighbourhood design and social interaction in low-density housing contexts. *J. Urban Des.* **2020**, *25*, 108–133. [CrossRef]
8. Kenna, T.; Goodman, R.; Stevenson, D. Privatising the suburbs: Examining the trends and implications of 20 years of private residential development in Sydney, Australia. *Geogr. Res.* **2017**, *55*, 269–282. [CrossRef]
9. Smith, P. The contested geographies of master planned estates: The role of the building design codes. *Aust. Geogr.* **2019**, *50*, 243–264. [CrossRef]
10. McGuirk, P.M.; Dowling, R. Understanding Master-Planned Estates in Australian Cities: A Framework for Research. *Urban Policy Res.* **2007**, *25*, 21–38. [CrossRef]
11. Rosenblatt, T.; Cheshire, L.; Lawrence, G. Social Interaction and Sense of Community in a Master Planned Community. *Hous. Theory Soc.* **2009**, *26*, 122–142. [CrossRef]
12. Falconer, R.; Newman, P.; Giles-Corti, B. Is practice aligned with the principles? Implementing New Urbanism in Perth, Western Australia. *Transp. Policy* **2010**, *17*, 287–294. [CrossRef]
13. Francis, J.; Giles-Corti, B.; Wood, L.; Knuiman, M. Neighbourhood influences on mental health in master planned estates: A qualitative study of resident perspectives. *Health Promot. J. Aust.* **2014**, *25*, 186–192. [CrossRef] [PubMed]
14. Maller, C.; Nicholls, L.; Strengers, Y. Understanding the materiality of neighbourhoods in 'healthy practices': Outdoor exercise practices in a new Master-planned Estate. *Urban Policy Res.* **2016**, *34*, 55–72. [CrossRef]
15. Cheshire, L.; Walters, P.; Wickes, R. Privatisation, Security and Community: How Master Planned Estates are Changing Suburban Australia. *Urban Policy Res.* **2010**, *28*, 359–373. [CrossRef]
16. Park, J.H.; Lee, D.K.; Park, C.; Kim, H.G.; Jung, T.Y.; Kim, S. Park accessibility impacts housing prices in Seoul. *Sustainability* **2017**, *9*, 185. [CrossRef]
17. Thompson, C. Master-planned estates: Privatization, socio-spatial polarization and community. *Geogr. Compass* **2013**, *7*, 85–93. [CrossRef]
18. Tewari, S.; Beynon, D. Changing neighbourhood character in Melbourne: Point Cook a case study. *J. Urban Des.* **2018**, *23*, 456–464. [CrossRef]
19. Dowling, R.; Atkinson, R.; McGuirk, P. Privatism, privatisation and social distinction in master-planned residential estates. *Urban Policy Res.* **2010**, *28*, 391–410. [CrossRef]
20. Kenna, T. Consciously Constructing Exclusivity in the Suburbs? Unpacking a Master Planned Estate Development in Western Sydney. *Geogr. Res.* **2007**, *45*, 300–313. [CrossRef]

21. Gwyther, G. Paradise Planned: Community Formation and the Master Planned Estate. *Urban Policy Res.* **2005**, *23*, 57–72. [CrossRef]
22. Bangura, M.; Lee, C.L. Housing price bubbles in Greater Sydney: Evidence from a submarket analysis. *Hous. Stud.* **2022**, *37*, 143–178. [CrossRef]
23. Australian Bureau of Statistics. 2016 Census QuickStats. 2016. Available online: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/036 (accessed on 15 September 2021).
24. Talen, E. The social goals of new urbanism. *Hous. Policy Debate* **2002**, *13*, 165–188. [CrossRef]
25. Stanislav, A.; Chin, J.T. Evaluating livability and perceived values of sustainable neighborhood design: New Urbanism and original urban suburbs. *Sustain. Cities Soc.* **2019**, *47*, 101517. [CrossRef]
26. Trudeau, D. Sustaining Suburbia through New Urbanism: Toward Growing, Green, and Just Suburbs? *Urban Plan.* **2018**, *3*, 50–60. [CrossRef]
27. Ebrahim, N. Sense of community in new urbanism neighbourhoods: A review. *Open House Int.* **2015**, *40*, 25–29. [CrossRef]
28. Trudeau, D. A typology of New Urbanism neighborhoods. *J. Urban Int. Res. Placemaking Urban Sustain.* **2013**, *6*, 113–138. [CrossRef]
29. Parham, S.; Jones, A. Exploring sustainable urbanism in masterplanned developments: A collective case study of slippage between principles, policies, and practices. *J. Urban* **2021**, *14*, 97–124. [CrossRef]
30. Kim, J.; Larsen, K. Can new urbanism infill development contribute to social sustainability? The case of Orlando, Florida. *Urban Stud.* **2017**, *54*, 3843–3862. [CrossRef]
31. Alidoust, S.; Bosman, C. Master planned communities for the ageing population: How sociable are they? *Cities Health* **2017**, *1*, 38–46. [CrossRef]
32. Lund, H. Testing the claims of New Urbanism: Local access, pedestrian travel, and neighboring behaviors. *J. Am. Plan. Assoc.* **2003**, *69*, 414–429. [CrossRef]
33. Francis, J.; Giles-Corti, B.; Wood, L.; Knuiman, M. Creating sense of community: The role of public space. *J. Environ. Psychol.* **2012**, *32*, 401–409. [CrossRef]
34. Johnson, L.C. Master planned estates: Pariah or panacea? *Urban Policy Res.* **2010**, *28*, 375–390. [CrossRef]
35. Zhu, Y.; Fu, Q. Deciphering the Civic Virtue of Communal Space: Neighborhood Attachment, Social Capital, and Neighborhood Participation in Urban China. *Environ. Behav.* **2017**, *49*, 161–191. [CrossRef]
36. Williams, J. Designing Neighbourhoods for Social Interaction: The Case of Cohousing. *J. Urban Des.* **2005**, *10*, 195–227. [CrossRef]
37. Talen, E. Measuring the public realm: A preliminary assessment of the link between public space and sense of community. *J. Archit. Plan. Res.* **2000**, *17*, 344–360.
38. Centers, K.T.; Gómez, E. Exploring the relationship between an urban neighborhood park and psychological sense of community. *Recreat. Parks Tour. Public Health* **2019**, *3*, 113–138. [CrossRef]
39. Rutherford, J.; Carter, M.; Christidis, K. Classification framework for public open space. *Australas. Parks Leis.* **2013**, *16*, 34–36.
40. Kim, J.; Kaplan, R. Physical and Psychological Factors in Sense of Community: New Urbanist Kentlands and Nearby Orchard Village. *Environ. Behav.* **2004**, *36*, 313–340. [CrossRef]
41. Berkman, L.F.; Glass, T.; Brissette, I.; Seeman, T.E. From social integration to health: Durkheim in the new millennium. *Soc. Sci. Med.* **2000**, *51*, 843–857. [CrossRef]
42. Kim, H.H.-s. 'Strength of weak ties', neighborhood ethnic heterogeneity, and depressive symptoms among adults: A multilevel analysis of korean general social survey (kgss) 2012. *Soc. Sci.* **2017**, *6*, 65. [CrossRef]
43. Gardner, P.J. Natural neighborhood networks—Important social networks in the lives of older adults aging in place. *J. Aging Stud.* **2011**, *25*, 263–271. [CrossRef]
44. Weijs-Perrée, M.; van Den Berg, P.; Arentze, T.; Kemperman, A. Factors influencing social satisfaction and loneliness: A path analysis. *J. Transp. Geogr.* **2015**, *45*, 24–31. [CrossRef]
45. Henning, C.; Lieberg, M. Strong ties or weak ties? Neighbourhood networks in a new perspective. *Scand. Hous. Plan. Res.* **1996**, *13*, 3–26. [CrossRef]
46. Hickman, P. "Third places" and social interaction in deprived neighbourhoods in Great Britain. *J. Hous. Built Environ.* **2013**, *28*, 221–236. [CrossRef]
47. Dowling, R.; McGuirk, P.M. *Situating Master-Planned Estates*; Facult of Social Sciences-Papers; University of Wollongong: Wollongong, Australia, 2005; p. 2345.
48. Australian Council for New Urbanism. Australian New Urbanism: A Guide to Projects. Available online: https://www.acnu.org/australian-projects-book-2006/ (accessed on 25 October 2021).
49. De Vaus, D.; de Vaus, D. *Surveys in Social Research*; Routledge: London, UK, 2013.
50. Treiman, D.J. *Quantitative Data Analysis: Doing Social Research to Test Ideas*; Jossey-Bass, A Wiley Imprint: San Francisco, CA, USA, 2014.
51. Delmelle, E.C.; Haslauer, E.; Prinz, T. Social satisfaction, commuting and neighborhoods. *J. Transp. Geogr.* **2013**, *30*, 110–116. [CrossRef]
52. Prazak, M.D. An exploration of In-Person and Online Social Interaction: Examining the Effects of Two Domains of Social Behavior. Ph.D. Thesis, The University of North Dakota, Grand Forks, ND, USA, 2019.

53. Taber, K.S. The use of Cronbach's alpha when developing and reporting research instruments in science education. *Res. Sci. Educ.* **2018**, *48*, 1273–1296. [CrossRef]
54. Little, R.J. A test of missing completely at random for multivariate data with missing values. *J. Am. Stat. Assoc.* **1988**, *83*, 1198–1202. [CrossRef]
55. Cheema, J.R. Some general guidelines for choosing missing data handling methods in educational research. *J. Mod. Appl. Stat. Methods* **2014**, *13*, 3. [CrossRef]
56. Jolliffe, I.T.; Cadima, J. Principal component analysis: A review and recent developments. *Philos. Trans. R. Soc. A Math. Phys. Eng. Sci.* **2016**, *374*, 20150202. [CrossRef]
57. Chen, Y.; Wang, J.; Yu, Y. A study on consumers' willingness to pay for remanufactured products: A study based on hierarchical regression method. *Front. Psychol.* **2019**, *10*, 2044. [CrossRef] [PubMed]
58. Jeong, Y.; Jung, M.J. Application and interpretation of hierarchical multiple regression. *Orthop. Nurs.* **2016**, *35*, 338–341. [CrossRef] [PubMed]
59. Lu, S. The effects of neighborhood variables on needs of social care: A hierarchical multiple regression of senior residents in china. *J. Soc. Serv. Res.* **2019**, *45*, 241–253. [CrossRef]
60. Congress for the New Urbanism (CNU). Charter of the New Urbanism. Available online: https://www.cnu.org/who-we-are/charter-new-urbanism (accessed on 16 November 2021).