



## Walkable Neighborhoods: Linkages Between Place, Health, and Happiness in Younger and Older Adults

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1 **Walkable Neighborhoods: Linkages Between Place, Health, and Happiness in Younger and Older**  
2 **Adults**

3  
4 **Introduction**

5 Does living in a walkable neighborhood make us happier? This study examines whether  
6 the design of the places where people reside in Dublin, Ireland affects their happiness,  
7 controlling for traditional predictors. Findings suggest that the urban environment does  
8 indeed affect happiness; people living in and around Dublin who could walk to attain most of  
9 their daily needs were happier all other things being equal. In finding that urban design  
10 matters for the happiness of residents, we hope to contribute to the call for urban planners,  
11 engineers, developers and politicians to recognize that the way they choose to plan cities and  
12 suburbs has effects on well-being. The current study also finds that the effect of walkability  
13 on happiness differs when we compare younger and older adults. In general, the walkability  
14 of the place one lives has a direct effect on happiness for younger people, especially those  
15 who are in the 36 to 45 year-old age range. However, the effect of walkability on the  
16 happiness of adults aged 45 years and older is indirect and mediated by the positive effects of  
17 walkability on health, trust in others, and levels of satisfaction with the appearance of their  
18 neighborhoods. In other words, for older adults the walkability of their neighborhood has  
19 positive effects on health, trust in others, and satisfaction with neighborhood appearance, and  
20 these variables in turn predict happiness.

21 The findings reported in this article build upon a growing body of research which  
22 suggests that urban planning and the design of the built environment matter for human health  
23 and wellbeing (Frumkin et al., 2004; Saelens and Handy, 2008; Brown, et al., 2008; Sallis, et  
24 al., 2011; Mueller, et al. 2015; Krefis, et al., 2018; Mouratidis, 2021). People living in  
25 walkable areas of cities and suburbs are more likely to walk to destinations and thus meet  
26 recommended daily physical activity guidelines, which is important to maintain physical  
27 health across the lifespan (Foster and Giles-Corti, 2008; Forsyth, et al., 2008; Sallis and  
28 Bowles, et al., 2009; Brownson, et al., 2009; Feng, et al., 2010; Durand, et al., 2011).  
29 Moreover, walking can also reduce stress and anxiety and thus help to support mental health  
30 (Martin, et al., 2014; Eibich et al., 2016; Beemer, et al., 2021). In addition to physical and  
31 mental health, living in a walkable neighborhood has also been found to enhance social  
32 connections, neighborhood ties, and social capital (Freeman, 2001; Leyden, 2003; Wood et

33 al., 2008; Rogers and Sukolratanamettee, 2009; Richard, et al., 2009; Rogers, et al., 2010)  
34 and decrease the likelihood of social isolation (Nasar and Julian, 1995; Mathis, et al., 2016).  
35 Access to green space – local parks for example, often found in walkable places – appear to  
36 also contribute to physical health, social connections and well-being (Sugiyama, et al., 2008;  
37 Ward Thompson, et al., 2016; Pfeiffer & Cloutier, 2016; Larson, et al., 2016; Houlden, et al.,  
38 2017; Pope, et al. 2018; Hunter, et al., 2019; Wang, et al., 2019). The current study builds  
39 upon work in the area by examining the relationship between neighborhood walkability and a  
40 different dependent variable: happiness.

#### 41 **Understanding Happiness: The Traditional Predictors of Happiness**

42 This study focuses on the happiness of urban residents, using data from Dublin city,  
43 Ireland and its suburbs. Why happiness? Social scientists and political thinkers increasingly  
44 argue that, beyond GDP, a nation’s welfare is best judged by its ability to make people happy  
45 (Layard, 2005; Stiglitz, Sen, and Fitoussi, 2009). Others have proposed that policymakers and  
46 the planning professions should focus more on making cities happier and more liveable  
47 places (Glaeser, 2011; Florida, et al., 2013; Montgomery, 2013). This focus upon happiness  
48 is not simply a contemporary phenomenon: it has important historical precedent. Aristotle  
49 argued that the “best form of government is that under which the body politics is happiest”  
50 (Aristotle, 1996, pp. 177-78); and “the idea of enabling the pursuit of happiness is intertwined  
51 with the foundation of the American republic” (Leyden, et al., 2011, p. 863; Maier, 1997).

52 There is an expansive literature on the predictors of happiness. The traditional literature  
53 focuses mainly on individual level factors. Higher personal income, for example, is typically  
54 positively related to happiness but there is a diminishing return once incomes are above  
55 median levels in OECD countries (Frank, 2005).<sup>1</sup> Relatedly, being unemployed predicts  
56 lower happiness (Kent, et al., 2017) and likely also leads to stress, disconnection with  
57 workplace social connections and a loss of self-esteem (Helliwell and Putnam, 2005). A  
58 person’s health and social connections also matter (Layard, 2005). Higher self-assessed  
59 health is significantly and consistently positively associated with happiness (Leyden, et al  
60 2011; Frey and Stutzer, 2002; Marks and Shah, 2005). Positive effects of social relationships  
61 on happiness are also consistently observed, be they within families, among friends or among  
62 neighbors. Married people tend to report being happier and people who report having higher  
63 levels of social support or social connections or frequent interactions with friends and  
64 neighbors also report feeling happier (Putnam, 2000; Helliwell and Putnam, 2005). The same

65 is true for people who feel more trusting of other people. These social connections and trust  
66 as well as community involvement are key components of social capital, defined as the  
67 degree to which people feel connected to others and within their community. Individuals  
68 who report higher levels of social capital have been found to report higher levels of well-  
69 being (Putnam, 2000; Kent, et al, 2017).

## 70 **Happiness and the Built Environment**

71 The current study examines the degree to which variables related to the built environment  
72 contribute to the happiness of city residents. The key independent variable related to the built  
73 environment is a measure of neighborhood walkability. We conceive of a walkable  
74 neighborhood as a place that is designed with the pedestrian in mind. It is a place where  
75 residents can easily attain their daily needs on foot by walking to local shops, cafes, parks,  
76 and pubs, and where children can walk to school. Typically, public transportation is easy to  
77 access. Such places often have a unique, village-like, sense of place (See Talen and  
78 Koschinsky, 2013, for a discussion). Walkable neighborhoods are not places where residents  
79 feel dependent upon cars; they are not associated with malls, strip-malls, wide roads, and  
80 large parking lots.

81 We argue that walkability is an important predictor of happiness for city residents and we  
82 put this hypothesis to the test by examining the effects of walkability over-and-above the  
83 effects of other traditional predictors of happiness and other aspects of the city environment.

## 84 **The Existing Literature**

85 The existing literature is not easily summarized in part because it tends to focus on  
86 different aspects of wellbeing (e.g., happiness or life satisfaction) and the built environment  
87 (e.g., walkability or green space). Study variables are often measured in different ways. What  
88 is interesting, however, is that all of the existing studies suggest some aspect of the built  
89 environment matters for wellbeing or happiness no matter how these outcomes are measured.  
90 Where these studies tend to disagree is on what aspects of the built environment matter most.

91 Leyden and colleagues (2011) for example, found that while holding traditional predictors  
92 of happiness constant, aspects of the built environment such as access to cultural amenities,  
93 good public transportation and whether residents felt their city was beautiful impacted self-  
94 reported happiness in ten international cities. Xiong and Zhang (2016) found that young  
95 adults living in Japan reported higher life satisfaction and happiness if they lived in a

96 metropolitan area as opposed to a non-metropolitan area. According to Xiong and Zhang  
97 (2016), younger adults feel cities offer more employment opportunities, more housing choice  
98 and residential environments “with good walkability”, access to viable public transportation  
99 and more opportunities to be social and to participate “in leisure activities, learning activities,  
100 and community activities” (p. 46). Other studies have reported similar linkages between  
101 aspects of the built environment and well-being (Jaśkiewicz and Besta 2014; Cao, 2016;  
102 Wang and Wang, 2016; Liu, et al., 2017; and Dong and Qin, 2017).

103 The work of Ettema and Schekkerman (2016), Kent et al. (2017), Hart et al. (2018), and  
104 Pfeiffer et al. (2020) are particularly relevant and insightful for the purposes of the current  
105 study. Each study examined effects of the built environment on happiness and/or life  
106 satisfaction while also statistically controlling for the influence of other traditional predictors  
107 of wellbeing. All of these studies suggest that aspects of the built environment matter for  
108 wellbeing but the pathways and relationships are not always consistent. Ettema and  
109 Schekkerman (2016), using data from the Netherlands, found that two subjective perceptions  
110 of the built environment –perceived attractiveness and perceived safety of neighborhoods –  
111 were related to self-reported life satisfaction. Using data collected in Sydney, Australia, Kent  
112 et al. (2017) found that subjective ratings of the built environment matter more consistently  
113 than objective measures of the built environment for well-being. More specifically,  
114 controlling for traditional predictors of well-being such as being unemployed or married,  
115 Kent et al. found that living in a walkable neighborhood – measured both objectively and  
116 subjectively – impact a respondent’s self-reported life satisfaction. However, when they  
117 examined happiness, only subjective measures of neighborhood walkability were significant.  
118 For both life satisfaction and happiness, subjective measures of neighborhood attractiveness  
119 (i.e., how aesthetically pleasing the neighborhood is) were also significant. At the same time,  
120 objectively measured access to green space did not predict either happiness or life  
121 satisfaction.

122 A comprehensive study by Hart et al. (2018) examined how objective and subjective  
123 physical and social neighborhood characteristics affect happiness in cities and suburbs in five  
124 European countries. They examined the relationships between fourteen independent variables  
125 and happiness in a series of models that included other variables as moderators (e.g., age,  
126 children in the household, education, and employment status, among others). Across these  
127 separate models, they found a range of effects, including higher happiness levels for people  
128 living in neighborhoods that were cleaner, perceived to be safer, more aesthetic, had more

129 water and green spaces, and places with more social contacts, and where neighbors were  
130 trusted. Surprisingly, they also found negative associations between the perceived number of  
131 destinations and happiness. Similar to Kent et al. (2017), Pfeiffer et al. (2020) model effects  
132 on life satisfaction and examine both objective and subjective measures of neighborhood  
133 walkability, and access to public transport and parks along with a comprehensive list of  
134 control variables. Pfeiffer and colleagues found that perceived but not objective  
135 neighborhood park access was related to greater life satisfaction, whereas objectively  
136 measured but not perceived neighborhood walkability was related to life satisfaction.

137 In summary, research across different countries suggests that aspects of the built  
138 environment such as walkability, access to quality parks, and neighborhoods that are  
139 aesthetically pleasing, more socially connected and safe influence self-reported well-being of  
140 residents. At the same time, questions remain as to the relative influence on happiness of  
141 different subjective perceptions or objective measures of the city environment, how well  
142 these effects replicate across different cities, how robust effects are when other predictors of  
143 happiness are statistically controlled for, and whether these effects vary across different  
144 groups in the larger population of city residents.

#### 145 **The Current Study: What is our contribution to the literature?**

146 Our purpose here is to complement and extend the existing scholarly literature on the  
147 ways that the built environment affects happiness, with a primary focus on the effects of  
148 walkability. We add a new city and country as a focus of enquiry, Dublin, Ireland. We  
149 attempt to model happiness in a rigorous way as we control for variables such as self-reported  
150 health (not commonly included in studies to date) and other important predictors of happiness  
151 (e.g., employment and marriage). While focusing on walkability, we also control for the  
152 effects of other aspects of the city environment (e.g., access to neighborhood sites such as  
153 green spaces and perceived attractiveness of neighborhoods), along with feelings of trust and  
154 perceptions of crime. Controlling for the effects of other potential predictors of happiness is  
155 important. For example, studies reporting that green spaces affect happiness do not always  
156 control for neighborhood social connections or feelings of trust in others. When positive  
157 effects of green spaces on happiness are reported in these studies, researchers will naturally  
158 question if it is the green spaces affecting happiness or if it is the social connections and  
159 feelings of trust occurring in green spaces that matter (Maas et al., 2009a). It is also  
160 important to control for the perception of crime; walkable areas with high crime can depress

161 everything from the likelihood of walking to feelings of trust in others. Mouratidis (2019), for  
162 example, finds that people living in compact and potentially more walkable neighborhoods  
163 report having a higher life satisfaction only after statistically controlling for neighborhood  
164 quality as measured by perceived safety, noise, and cleanliness. In other words, some  
165 walkable neighborhoods enable social interactions and walking because crime is perceived to  
166 be low and they are more pleasant to be in. It is important to try to untangle the direct and  
167 indirect effects of various control and built environment effects on happiness, which we work  
168 to achieve here. Finally, we introduce a lifespan and developmental perspective by focusing  
169 explicitly on the effects of walkability on the happiness of younger and older adults.

### 170 **The Importance of Age, Place, and Happiness**

171 Lifespan developmental science includes a focus on how the city environment can affect  
172 well-being across the adult lifespan. Although ecological models of aging emerged in the  
173 formative years of lifespan science (Lawton and Nahemow, 1973), and argued, for example,  
174 that the physical (or built) environment may influence the well-being of older adults,  
175 empirical analysis of these relationships were largely ignored by researchers for decades  
176 (Wahl, et al., 2012). More recent work indicates that older adults value places that facilitate  
177 autonomy, mobility, emotional attachment, social participation, and a sense of belonging  
178 (Taylor, 2001; Plouffe & Kalache, 2010; Rosso, et al., 2011; Wahl, et al., 2012). When it  
179 comes to the design of neighborhoods for older adults, this entails consideration of the  
180 walkability of neighborhoods, access to transportation, access to amenities that facilitate  
181 physical activity, and social and cultural engagement (Liu, et al., 2009).

182 From a lifespan developmental science perspective, comparing the effects of walkability  
183 on groups of younger and older adults living in the same city is valuable. Do aspects of the  
184 built environment affect the happiness of older adults, as hypothesized in early ecological  
185 models of aging? And to what degree does the built environment affect the happiness of  
186 younger adults? Richard Florida (2017), for example, has long proposed that cities must  
187 compete to attract younger, highly educated and creative people, in part through the  
188 promotion of vibrant walkable neighborhoods with good public transportation and easy  
189 access to cafes, green spaces, sports and cultural amenities, and nightlife. Notably, very few  
190 studies have addressed the differential effects of the built environment on younger and older  
191 adults.

192 One line of empirical work by Leyden and colleagues on the relationship between the city  
193 environment and the happiness of residents highlights a distinction between the role of place  
194 and performance variables (Leyden, et al, 2011; Goldberg, et al., 2012). Place variables  
195 include residents' ratings of how beautiful their city is, how proud they are to live there, and  
196 how easy it is to access shops, cultural and sports amenities, green spaces, and public  
197 transportation. Performance variables include residents' ratings of the city's basic services  
198 such as good schools, the quality of healthcare facilities, safety from crime (from good  
199 policing), and facilities serving the disadvantaged. Findings indicate that, even after  
200 controlling for traditional predictors of happiness such as self-rated health status and social  
201 relations, both place and performance variables predict residents' happiness. Interestingly, in  
202 a study of younger and older adults living in Berlin, London, New York, Paris, and Toronto,  
203 Hogan and colleagues (2016) found that the happiness of younger city residents was strongly  
204 predicted by place variables whereas for older residents, performance variables were more  
205 important for happiness.

206 At the nexus of performance and place constructs, the walkability of neighborhoods may  
207 have both a performance aspect (i.e., walkability supports access to needed services such as  
208 doctors' offices) and a place aspect (i.e., walkability supports access to cultural places,  
209 shopping and cafes). From this perspective, we would predict strong effects of walkability on  
210 happiness, consistent with previous research. At the same time, the effects of walkability on  
211 happiness may also be different for younger and older adults. As noted above, research  
212 suggests that autonomy and a sense of belonging, and an environment that supports these,  
213 may be critical for the well-being of older adults. Living in a walkable neighborhood may  
214 support these feelings and affect happiness in older adults. Also, assuming feelings of  
215 autonomy and belonging become increasingly important for older adults, the effects of  
216 walkability on happiness may become increasingly mediated by other variables related to  
217 autonomy and belonging. For example, living in a walkable neighborhood may enhance  
218 feelings of trust because such places allow one to move freely and connect socially with  
219 others at local destinations such as coffee shops or parks. These feelings of trust may then  
220 predict higher levels of happiness. Also, given the importance of physical and cognitive  
221 activity and engagement for maintaining health and wellbeing as we grow older (Hogan et al.,  
222 2005; Staff et al., 2018), the effects of walkability on happiness may be increasingly  
223 mediated by health and the extent to which walkability prompts satisfaction within one's  
224 neighborhood. Conversely, the effects of walkability on the happiness of younger adults may

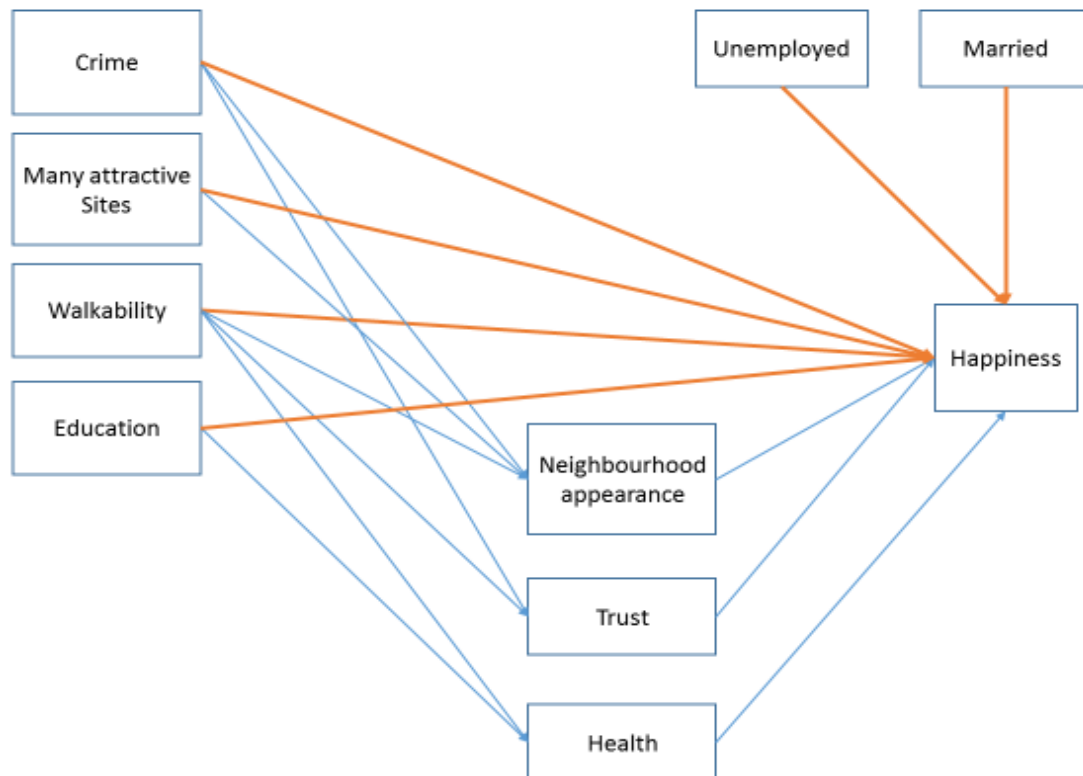


225 be more direct in the sense that walkability is important for everyday life including work  
226 activities, access to local cultural and shopping amenities, access to transportation links and  
227 social engagement, but less strongly mediated by satisfaction with neighborhood appearance,  
228 feelings of trust in others, or the effects of walkability on health.

### 229 **Our Study: The effects of living in a walkable neighborhood on happiness**

230 We seek to replicate and build upon existing research and examine the effects of both the  
231 built and social environment on the happiness of younger and older adults. We hypothesize  
232 that living in a walkable neighbourhood has both direct effects on happiness as well as effects  
233 that are mediated by perceptions of the social environment (i.e., feelings of trust in others),  
234 health, and satisfaction with the appearance of local neighborhoods. We hypothesize that  
235 these mediational effects are stronger among older adults when compared with younger  
236 adults.

237 Consistent with the approach of similar studies, when examining the effects of  
238 walkability on happiness we control for a variety of traditional predictors, including marital  
239 and employment status, health, and education. We also control for other features of the urban  
240 environment including the availability of attractive sites nearby (such as greenspaces),  
241 satisfaction with neighborhood appearance, and perceptions of crime. We use multi-group  
242 structural equation modelling to examine differences in the effects of neighborhood  
243 walkability on happiness across four age-groups. Our structural model is presented below  
244 (see Figure 1).



245

246 Figure 1. Structural model tested simultaneously across four age groups, describing direct  
 247 and indirect effects of walkability and other control variables on happiness. Direct effects are  
 248 indicated using orange lines and indirect, mediated pathways are indicated using blue lines.

249 **Method**

250 The data for this study comes from (Anonymous). A comprehensive household  
 251 population survey of 1064 adults living in Dublin City and its suburbs was developed using  
 252 the insights of professionals working in transport, planning, health, architecture, and  
 253 geography and from public representatives from the Dublin Area. The complete survey can  
 254 be accessed via ([Provide live link](#)).

255 **LORRIANE TO ADD** (Please add to this section of the paper. 90 percent of what you  
 256 have to say about how neighborhoods were selected, the household sampling process, and the  
 257 sources of the variables and their reliability *should be in the Technical Appendix*. Here we  
 258 only provide a few sentences on these matters and refer them to the Technical Appendix for  
 259 detail.

260 The survey was carried out from July to September 2011. With the aid of professionals  
 261 who participated in the study's focus groups, 16 neighborhoods or local areas were selected

262 and an adult living in sampled households within these neighborhoods were surveyed. The 16  
263 neighborhoods were identified as being either high or low in terms of walkability based upon  
264 an approach that utilized focus groups, existing census and city-level data, and the input of  
265 experts using...LORRAINE to add

266 The study also sought to include some neighborhoods categorized as being economically  
267 deprived based upon census data. The goal was to attain respondents from a mix of  
268 neighborhood types - some in the historic inner-city core, the outer city developed primarily  
269 in the 20th Century, and the newer city suburbs. Additional information about how the  
270 neighborhoods were chosen is in our Technical Appendix.

271 Did the process we used to choose high walkable and low walkable places actually  
272 work? Table 1 suggests it did. Our survey included a range of questions that asked  
273 respondents to assess many aspects of their neighbourhood. The variables highlighted in  
274 Table 1 strongly suggest that residents in walkable places reported different transport  
275 experiences and clearly perceived their neighborhoods differently than those living in less  
276 walkable places.

277 -----  
278 Insert Table 1 around here  
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280 Examining mean differences (using Independent Samples t-tests) of these variables indicate  
281 that surveyed respondents living in low walkable neighborhoods tended to report public  
282 transportation as difficult to use in their neighborhoods; they also reported owning more cars  
283 and spending more on gasoline/fuel for their cars. As expected, people living in high  
284 walkable neighborhoods reported finding that there were “many different routes for walking  
285 from place to place” and more pedestrian friendly crosswalks. Residents of the two  
286 neighbourhood types also reported living in built environments that were distinctly different  
287 in other ways. Residents living in low walkable places reported that they were more likely to  
288 live in places with large parking lots in front of shops and businesses, whereas residents of  
289 high walkable neighborhoods were more likely to report living in places with a lot of  
290 “inviting local shops” within a context that had “a village feel to it” with lots of people  
291 “shopping or visiting restaurants and pubs nearby.” Likewise, those living in areas identified  
292 as highly walkable tended to see the places they lived as being more “unique with personality

293 and character.” At the neighbourhood level of analysis, both expert-rated walkability and  
294 deprivation level (coded as high and low using the Hassee index) were also related to the  
295 happiness of residents across city regions. Specifically a 2 (high, low walkability) x 2 (high,  
296 low deprivation) ANOVA revealed effects on happiness of both walkability,  $F(1,1) = 11.02$ ,  
297  $p < .001$ , and deprivation,  $F(1,1) = 11.02$ ,  $p < .001$ . There was also a significant interaction  
298 effect,  $F(1,1) = 9.18$ ,  $p < .005$ , with higher happiness reported at the aggregate level in high  
299 walkable, low deprivation neighborhoods ( $M = 4.34$ ) compared with low walkable, low  
300 deprivation neighborhoods ( $M = 4.00$ ,  $p < .001$ ). However, there was no significant  
301 difference in happiness levels when high walkable, high deprivation ( $M = 3.80$ ) and low  
302 walkable, high deprivation ( $M = 3.79$ ) neighborhoods were compared.

303 In the next phase of analysis, we examined the direct and indirect effects of walkability  
304 on happiness ratings of individual city residents while controlling for a range factors known  
305 to influence happiness (see Figure 1). We present the key variables included in the structural  
306 model in Table 2.

307 -----  
308 Insert Table 2 around here  
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310 Two key variables are worthy of discussion at this point. Our dependent variable is a self-  
311 reported measure of happiness. A common way of measuring happiness is to ask survey  
312 respondents to self-report their levels of happiness or subjective well-being, often using a single  
313 question as we have done in our study (Kalmijn and Veenhoven 2005; Weimann et al. 2015).  
314 These single-item measures tend to use variations on the following types of statements: “all in  
315 all, how satisfied are you with your life at the moment?” (Weimann et al. 2015, p. 89), or  
316 “taking all together, how satisfied or dissatisfied are you currently with your life as a whole?”  
317 (Kalmijn and Veenhoven 2005, p. 359). The question we use—“all things considered, how  
318 happy are you right now?”—draws on this established approach.<sup>2</sup>

319 Our key independent variable is our measure of perceived walkability of neighborhoods  
320 which has been used in previous studies (e.g., see Leyden, 2003; Rohrer, et al., 2004; Rogers,  
321 et al., 2010; Kwon, et al., 2019). Its reliability was most thoroughly examined by Bias et al.  
322 (2010) where it was compared to other established items. The measure’s reliability was  
323 assessed again for this study (see Technical Appendix). Our walkability measure asks

324 respondents to indicate the number of local destinations they can walk to without too much  
325 trouble, using a list of destinations as prompts. It is therefore a subjective measure and one  
326 that does not measure multiple aspect of walkability such as the ability to walk comfortably for  
327 recreation. Importantly, the measure taps into our operational definition of a walkable  
328 neighbourhood that enables residents to walk to and meet at local destinations such as parks,  
329 shops, community centers, and cafes among other places.

330 Our Technical Appendix provides additional information on the source of all variables used  
331 in this study as well as the reliability of each measure.

### 332 **Limitations**

333 Our research has several limitations. Our data is from Dublin, Ireland, which conceivably  
334 affects its generalizability to other countries. We only use subjective measures in this study  
335 and thus, unlike some of the prior studies in the area (e.g., Kent et al., 2017; Pfeiffer et al.,  
336 2020), we are not examining the effects of both objective and subjective predictors of  
337 happiness. Our measure of walkability is a subjective measure of how many destinations a  
338 respondent feels they could walk to in their neighbourhood without too much difficulty. At  
339 first glance, the use of a subjective measure may appear concerning, as planners do not plan  
340 perceived communities; they plan real ones. However, it is also important to note that  
341 perception of reality influence key aspects of behaviour and experience and this is true for  
342 research in many social science disciplines. For example, many political scientists have  
343 found that it is not just the objective performance of the economy that matters to voters, but  
344 voters' perceptions of economic performance. (Kevin add CITATIONS)

345 Finally, our data is from 2011. This is older than we would have preferred but we have  
346 no reason to suspect this fact undermines our findings<sup>3</sup>. Caution is also warranted given the  
347 correlational nature of the findings reported here; and while our central hypothesis is that  
348 walkability influences happiness, the correlational nature of findings do not allow a causal  
349 relationship or the direction of any such causal relationship to be inferred.

### 350 **Results**

351 Means and standard deviations for all variables in the model across the four adult groups  
352 are presented in Table 3. Prior to running our structural equation models, we examined these  
353 variables using one-way analysis of variance, correcting for multiple comparisons (i.e.,  $p <$   
354  $.0125$ ). Mean level differences (not shown) were found for a number of variables across age

355 groups. For example, although there were no differences across age-groups in self-reported  
356 happiness, self-reported health scores were significantly lower for the groups aged 46 – 60  
357 years and 60+ years when compared to adults aged 18 – 35 years ( $p < .01$ ), and adults aged  
358 60+ years also reported lower health when compared with adults aged 36 – 45 years ( $p < .01$ ).

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Insert Table 3 around here

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363 In relation to trust, in comparison with adults aged 18 – 35 years, adults aged 60+ were  
364 more likely to report that other people try to be helpful in general. However, there were no  
365 age-group differences in feelings of safety from crime. Adults aged 46 – 60 years reported  
366 that their neighborhoods were more walkable when compared with adults aged 18– 35 and 36  
367 – 45 years ( $p < .01$ ).<sup>4</sup> Also, when compared with adults aged 18– 35 and 36 – 45 years, there  
368 was a trend for adults aged 46 – 60 years to report that there were more attractive sites to visit  
369 in their area ( $p < .05$ ). However, there was no difference across age-groups in levels of  
370 satisfaction with the appearance of the neighborhoods in which they lived. Finally, as  
371 expected given rising levels of third level education in Ireland over recent decades, levels of  
372 education were higher in adults aged 18 – 35 and 36 – 45 years when compared with adults  
373 aged 46 – 60 years and 60+ years ( $p < .01$ ).

#### 374 **Structural Equation Models**

375 The multigroup model in Figure 1, where all structural relations other than the direct and  
376 indirect effects of walkability were constrained to be invariant across age-groups, provided a  
377 good fit to the data (see Technical Appendix, part B). A number of significant effects on  
378 happiness were observed that were common across all four age-groups (see Table 4).

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Insert Table 4 around here

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382 Similar to previous studies (e.g., see Layard, 2005; Leyden, et al., 2011; Hogan et al.,  
383 2016), being married was associated with higher levels of happiness, and being unemployed

384 was associated with lower levels of happiness. Likewise, higher self-reported health was also  
385 associated with higher happiness. Feelings of safety in relation to crime also predicted higher  
386 levels of happiness. Having less trust in others - specifically, reporting that people are out for  
387 themselves rather than being helpful - predicted lower levels of happiness. Finally, for adults  
388 across all age-groups, higher levels of satisfaction with neighborhood appearance predicted  
389 higher levels of happiness.

390 The effects of walkability on happiness differed across the four age groups in a number of  
391 ways. For adults aged 18 – 35 years, the effects of walkability were limited. The direct effect  
392 of walkability on happiness for this age group, although positive, was not statistically  
393 significant; there was no effect of walkability on health or trust in others; however, higher  
394 levels of walkability did predict greater satisfaction with neighborhood appearance, which in  
395 turn predicted higher happiness. Importantly, for adults aged 36 – 45 years higher levels of  
396 walkability were directly positively related to higher levels of happiness ( $p = .001$ ). Notably,  
397 the total effect of neighbourhood walkability on happiness in this group was  
398 0.077. Walkability was measured on a 17 point scale (0 – 16); therefore, a person with a  
399 maximum score on the measure of walkability could be expected to have, on average, a 1.3  
400 higher score on happiness compared to a person with a minimum score on walkability, that is,  
401 a 25% increase in their overall rating of happiness. An increase of 5 points in perceived  
402 walkability equates to an increase of approximately 8% in happiness.

403 For adults aged 46 – 60, there was no direct effect of walkability on happiness; instead  
404 and as hypothesized, the effects of walkability on happiness were mediated by health and  
405 trust in others. In particular, higher levels of neighborhood walkability were positively  
406 associated with health and trust, and higher levels of health and trust in turn predicted higher  
407 happiness in this age-group. Finally, for adults aged 60+ years the effects of walkability on  
408 happiness were strongly mediated by the positive effects of walkability on health ( $p = .001$ )  
409 and also by weaker effects of walkability on satisfaction with neighborhood appearance ( $p =$   
410  $.056$ ), both of which had strong positive effects on happiness. Notably, these effects of  
411 walkability on health and happiness across age-groups were observed even after the inclusion  
412 of the additional control variable to the structural model of regional deprivation.

## 413 **Discussion**

414 This study examined the happiness of residents living in Dublin and its suburbs. We find  
415 evidence that living in a walkable neighborhood has direct and indirect effects on happiness.

416 We controlled for individual-level factors that are known to affect happiness, including  
417 marital and employment status, trust, health and education, as well as city-level factors  
418 including the availability of attractive sites nearby (including green spaces), satisfaction with  
419 neighborhood appearance, and perceptions of crime.

420 As we discussed in our review of the literature, people living in walkable areas of cities  
421 are more likely to walk to more destinations, and this activity is important for maintaining  
422 health and for enhancing social connections. Previous research has also found significant  
423 linkages between measures of walkability and either life satisfaction or happiness. Our work  
424 here adds to these previous findings. In addition, we examine how the effects of walkability  
425 on happiness is impacted by age, which had not been fully investigated previously.

### 426 **Walkability, Age, and Happiness**

427 We found that the direct and indirect effects of walkability on happiness differed across  
428 the four age groups we examined in a number of ways. Consistent with our hypothesis, we  
429 found that, for adults aged 60+ years the effects of walkability on happiness were strongly  
430 mediated by their perceived health and to a lesser extent by satisfaction with neighborhood  
431 appearance, both of which had strong positive effects on happiness. In other words,  
432 neighborhood walkability had a positive effect on ratings of health and satisfaction with  
433 neighborhood appearance, and higher levels of health and satisfaction with neighborhood  
434 appearance in turn predicted higher happiness in this age-group. Similarly, for adults aged 46  
435 – 60 years, the effects of walkability on happiness were mediated by health and trust in  
436 others. As such, for our two older cohorts, the positive influences of living in a walkable  
437 neighborhood on health, feelings of trust in relation to others, and satisfaction with one's  
438 neighborhood, were all important for understanding the effects of walkability on happiness.

439 Interestingly, for younger adults aged 18 – 35 years, the effects of walkability were  
440 weaker, perhaps suggesting that other factors outweigh the influence of walkable  
441 neighborhoods in predicting the happiness for our youngest age grouping. While the direct  
442 effects of walkability on happiness were positive and significant in the context of a one-tailed  
443 hypothesis (i.e.,  $< .10$ ), the effect was not strong ( $p = .07$ ). Furthermore, there was no effect  
444 of walkability on health or trust among the younger adults aged 18 – 35 years. But  
445 walkability did predict satisfaction with neighborhood appearance in this younger group,  
446 which in turn predicted their happiness levels.



447 In terms of strong, direct, and unmediated effects of walkability on happiness, most  
448 noteworthy is our finding that the direct effect of walkability is highly significant for adults  
449 aged 36 – 45 years ( $p = .001$ ). This may reflect a certain quality of engagement with walkable  
450 neighborhoods that occurs among adults in this age-group. This could be linked, for example,  
451 to particularly salient activities with children (e.g., walking to school or going to parks) or  
452 engagement linked to recreational, fitness, and social outings with family and friends.  
453 Further qualitative research might explore the activities that best account for the strong link  
454 between walkability and happiness in this age-group.

455 Our findings build upon the work of others who have found important connections  
456 between the built environment and either happiness or life satisfaction (e.g., Leyden et al.  
457 2011; Ettema and Schekkerman, 2016; Kent et al. 2017; Hart et al., 2018, and Pfeiffer et al.  
458 2020.). As noted, a truly comprehensive understanding of the relative effects of objective and  
459 subjective built environment measures on happiness remains uncertain. This, however, is the  
460 nature of scientific enquiry; empirical evidence builds overtime. The current findings build  
461 upon a body of evidence and suggests a need for an ongoing dialogue about the effects of  
462 planning decisions on the well-being.

### 463 **Why plan and build walkable neighborhoods?**

464 Of what relevance are these findings for planners and other professionals who shape the  
465 places we live? At a minimum, our results suggest that a significant number of people are  
466 happier if they live in attractive, walkable places that enable social connections and trust in  
467 others. Many people appear to benefit from living in walkable places where residents can  
468 walk to attain their daily needs in local shops, cafes, schools, parks, and places for social,  
469 leisure, and worship activities. These walkable places are good for health because residents  
470 have an opportunity to be physically and socially active. While some of the linkages we find  
471 are indirect, for some age groups they are clearly direct. We find that Dublin residents aged  
472 36 – 45 are clearly happier if they live in a walkable neighborhood. Curiously, it is this same  
473 age group that is most frequently interested in first-time home ownership. In many  
474 municipalities in the United States and Ireland (and elsewhere) planning and engineering  
475 regulations and traditions, zoning codes, and the expectations of developers, financial  
476 institutions and even customers can have the – perhaps unintentional – effect of biasing  
477 development toward car-oriented suburbs. This means that this age group is likely to find a

478 shortage of available and affordable homes in mixed-use, pedestrian-oriented developments  
479 in cities or suburbs.

480 We would suggest that the exiting literature and our findings here point to a need to have  
481 an ongoing dialogue and rethink about the types of places we plan and build. What would it  
482 take to make living in a walkable neighborhood a viable option for more people? We need to  
483 know far more about planning, commercial, cost, and engineering barriers to planning and  
484 building more walkable neighborhoods. Is there a strong demand for living in walkable  
485 neighborhoods (urban and suburban) where children can walk to school and where residents  
486 can walk to locally-owned shops and cafes located within a transit-oriented village network?  
487 Would people actually prefer a different way of living that did not revolve around the car and  
488 big-box retail stores and associated chain restaurants? Levine (2006) has previously shown  
489 how planning and commercial biases produce places that many potential homebuyers do not  
490 desire to live in. For example, using a comprehensive survey of residents of Atlanta and its  
491 suburbs, Levine (2006) finds that a significant percentage of Atlantans would prefer to live in  
492 more “transit- and pedestrian- friendly zones” (or walkable neighborhoods) even if they  
493 already own a home in a car-dependent area<sup>5</sup>. The demand for more walkable communities  
494 may very well be just under the surface and the fact that there is far more discussion about  
495 walkability and transit-oriented development currently suggests change is already occurring.<sup>6</sup>

## 496 **Conclusion**

497 In this study we find that living in a walkable neighborhood has direct and indirect effects  
498 on the happiness of people living in and around Dublin, Ireland. The effect of living in  
499 walkable area is directly linked to the happiness of people aged 36 to 45 ( $p=.001$ ) and to a  
500 lesser extent those aged 18-35 years of age ( $p=.07$ ). For older adults, walkable places matter  
501 for happiness as well because they enhance other aspects of older adults’ lives related to  
502 happiness such as being healthier from walking or more socially connected or more trusting.  
503 This research builds upon previous research that suggests walkable built environments appear  
504 to be good for human beings; they enhance their happiness and enhance other predictors that  
505 enhance happiness like social capital and health. While more research is needed to untangle  
506 the best ways to measure walkability and its effects, we urge planners, engineers, politicians,  
507 developers, financial institutions, and related professions to have an open dialogue about the  
508 barriers to building new walkable neighborhoods that enable social connections, better health  
509 and a better quality of daily living. These same professions should also explore ways of

510 retrofitting existing car-dependent places (Dunham-Jones and Williamson, 2008), or building  
511 new transit-oriented developments (Cervero, et al. 2017). It is our contention that people  
512 should have a greater range of choices about where they decide to live and that walkable  
513 neighborhoods be made a viable option for more people. We suspect exploring new ways of  
514 planning walkable places would lead to happier, more connected communities that are better  
515 for the health and well-being of people and the planet.

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<sup>1</sup> As Helliwell and Putnam (2005) remark: “for the relative poor, money can buy happiness, but for the relative well-off, more money does not typically mean more happiness” (p. 446).

<sup>2</sup> The measure of happiness we use was originally developed in the context of a ten nation study organized by The National Academy of Sciences in the Republic of Korea and the Global Metropolitan Forum of Seoul and has been used in several previous studies, including Leyden et al. (2011) and Hogan et al (2016), among others. There is a considerable scholarly literature on the measurement of subjective happiness, satisfaction with life, and wellbeing. For overviews of this research, see Diener et al. (2009), OECD (2013), and Weimann et al. (2015).

<sup>3</sup> The structure of the neighbourhoods in this study have changed very little in the ten years since the data were collected. Since the survey was conducted most development in Dublin has been in green field suburban sites or brownfield sites from vacated industrial units. One low walkable area surveyed now has a pedestrian access route to the LUAS light rail system, and one high walkable deprived area in the city centre has had some student accommodation and build-to-rent properties built, but little has changed in the streetscapes and other measured criteria. We strongly suspect the same types of relationships between the built environment and happiness would be found if we were to replicate the study in Dublin again.

<sup>4</sup> The fact that adults aged 46 – 60 years reported that their neighborhoods were more walkable could suggest that this age group is self-selecting into more walkable neighborhoods. We feel this would be an interesting subject for future research in Dublin and elsewhere. Furthermore, future longitudinal studies can examine if self-selection and relocation effect changes in wellbeing and happiness across the lifespan.

<sup>5</sup> Levine also surveyed a national sample of developers and found a significant proportion expressed frustration with local regulatory biases that undermine their ability to provide “alternative developments” that were more mixed-use and pedestrian-oriented with access to a range of transportation modes (Levine, 2006, p. 126).

<sup>6</sup> There are other benefits to living in a walkable neighborhood not examined here. In many cities and suburbs around the world the car has become an essential part of life and needed to go almost anywhere. This car-dependency can pose significant burdens on individuals, families, and society as a whole. Car-dependency is associated with a greater likelihood of death or injury from car crashes (Frumkin, et al., 2004; Ewing, et al., 2016) and car-dependent cities and suburbs also have higher carbon footprints (Kahn, 2007; Glaeser & Kahn, 2010). In 2019, the typical new car cost Americans \$9,282 a year or \$773.50 a month (American Automobile Association, 2020). This puts a significant financial burden on most family budgets especially considering a large proportion of American homes have two or more cars. Furthermore, car-dependent urban places may restrict the movement of people who cannot afford a car or who are unable to drive. This may become a more significant problem for older adults, who often have a reduced income in retirement and possibly physical or cognitive conditions that limit their ability to drive. If we are to plan cities and suburbs in ways that are responsive to the needs of citizens, we need to consider carefully how different aspects of city infrastructure, amenities, and aesthetics influence health and well-being across the lifespan.