



October 2020

INTERACT PRIMER

UNDERSTANDING AND
MEASURING WELL-BEING IN
HEALTHY CITIES RESEARCH

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Understanding and measuring well-being in healthy cities research: A primer for the INTERACT project

Well-being is both a complex health subject matter and a term increasingly used in popular discussion to convey a broad range of topics related to living a good life. The US-based Gallup organization puts forward that well-being includes the following five elements: physical, career, social, financial and community that need to be fulfilled for people to thrive (Gallup, n.d.). More and more, well-being metrics are used over other standard economic indicators (income, employment, etc.) as they may yield more comprehensive insights on the success of societies, communities, and individuals (Deaton, 2012). In practice, the term “well-being” is often used in corporate or organizational vernacular as an umbrella term to include concepts related to physical and mental health, as well as a myriad of associated constructs including social connection, food and nutrition, sustainability, and collaboration (e.g., <https://wellbeing.ubc.ca/framework>). As the use of the term well-being spreads in popular discourse, its meaning becomes increasingly ambiguous.

Within the context of public health and urban planning research, it is relevant that well-being is a construct that can be measured at both the community and individual level. *Community* well-being indices have been developed relatively recently to cover collective individual well-being, quality of life, and community development (Sung & Phillips, 2016). An example is the Canadian Index of Well-Being (Smale & Hillbrecht, 2017) that measures community well-being across the following domains: community vitality; democratic engagement; education; environment; healthy populations; leisure and culture; living standards; and time use. *Individual* well-being has been conceptualized in a variety of ways, leading to a confusing range of synonymous and/or overlapping terms and constructs.

In light of this ambiguity, we use this primer to outline the constructs of individual subjective well-being, focus on tools used by the INTERACT research team to measure well-being, explore how built environment studies have used these tools in the past, and position our research questions related to well-being. Alongside this primer, we conducted a literature review on built environment research studies that used similar well-being measures to those used by the INTERACT research program. Results from this literature review are summarized below in the “Built Environment & Subjective Well-being in the Literature” and details of studies included in our review are provided in Appendix I & II.

Well-being constructs

Individual well-being has been described, defined, and parsed in many different ways. In contemporary psychology, well-being (synonymous with happiness) routinely falls into two different conceptual areas—hedonic and eudaimonic well-being (Kashdan et al., 2008).

Both of these concepts have their origin with Aristotle who distinguished hedonism (the search for pleasure) from eudaimonia (happiness from good works). In practice, hedonic well-being measures routinely capture affect (or emotion) as well as life satisfaction (Cooke et al., 2016) and these are also known as **subjective well-being**, or how people experience and evaluate their lives (Stone & Mackie, 2013) (Figure 1). Eudaimonic well-being (sometimes referred to as psychological well-being) conceptualization is less consistent in the elements that it captures (Cooke et al., 2016). Eudaimonic well-being often reflects on the future and may measure sentiments such as optimism, mastery, skills, achievement, engagement, positive relationships with others, interests, personal growth, self-worth, and autonomy (Stone & Mackie, 2013). INTERACT is primarily measuring subjective well-being (i.e., hedonic well-being), although some elements from eudaimonic well-being may surface in our qualitative work.

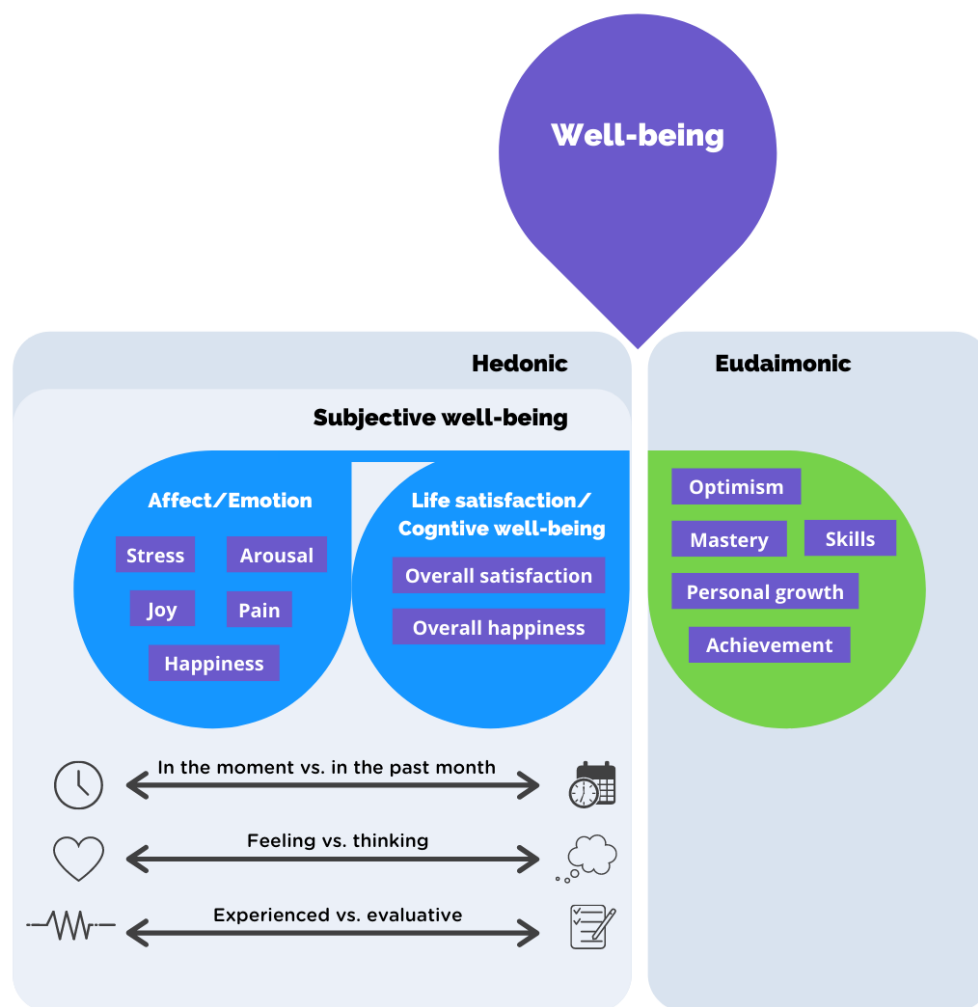


Figure 1. Dimensions of well-being

Aligning with the hedonic approach, measuring subjective well-being involves measuring affect and life satisfaction (Cooke et al., 2016). Affect (or emotion) includes happiness, joy,

stress, worry, arousal, and pain. Positive and negative emotions are not considered opposite ends of a single spectrum and as such are important to capture separately (Gere & Schimmack, 2011). Daily behaviour, such as routines of commuting and social interactions, can impact affective states, or mood. Some researchers further distinguish 'core affect' from emotions and moods, the former being considered immediate, automatic response without cognitive appraisal, and as such a component of the latter (Hanin & Effekakis, 2014). Displeasure, for example, could be considered core affect, while anger or embarrassment are more complex and thus examples of emotions. However, many people use the terms affect, emotion, and mood quite interchangeably.

Life satisfaction (sometimes referred to as cognitive well-being) is a global judgement of one's overall satisfaction or happiness. While the term "life satisfaction" is often interchangeable with "happiness", many researchers caution against using the term "happiness" when discussing well-being because of the multiplicity of meanings (Diener et al., 2003) and its inherent exclusion of negative experiences (Stone & Mackie, 2013). With different causes and correlates it is important to assess affect and life satisfaction as separate constructs (Stone & Mackie, 2013). For example, self-reported health status correlates strongly with affect (Deaton, 2012), while income (to a certain point) correlates more closely to life satisfaction (Kahneman & Deaton, 2010; Luhmann et al., 2011). Recognizing that the concept of life satisfaction is quite abstract and relating to various areas of one's life, some tools such as the Personal Well-Being index break it down to more specific life domains: health, standard of living, achievement, relationships, safety, community, and future security (Misajon et al., 2016).

Some have referred to these two spheres of subjective well-being—*affect* and *life satisfaction*—as "living life" or "thinking about life" (Deaton, 2012), leading to the association of—two additional notions—"experienced well-being" with affect and "evaluative well-being" with life satisfaction. Questions on the broader aspects of one's life are aligned with scales capturing evaluative well-being (Stone & Mackie, 2013). However, such aspects also raise questions about temporal reference.

When measuring well-being, are we considering a short- or longer-term evaluation? With longer reference periods, subjective well-being measures represent more global evaluations. When capturing a short-term 'instantaneous' experience, respondents tend to share their momentary emotion. Thus, affect is arguably best captured immediately, as longer reporting periods require some reconstruction to recall affect and therefore become more of an evaluative measure than an affective measure per se (Robinson & Clore, 2002). A method for measuring affect—and variations therein—is to use an Ecological Momentary Assessment (EMA) approach that involves repeated within-person measures as people go about their daily lives. By capturing affect in real time, recall bias is minimized (Shiffman et al., 2008).

INTERACT Tools for Measuring Well-being

INTERACT is using three tools to measure subjective well-being which aligns with the hedonic approach: the Subjective Happiness Scale (SHS) (Lyubomirsky & Lepper, 1999), the Personal Well-being Index (PWI) (International Wellbeing Group, 2013), and the Short Mood Scale (delivered using Ecological Momentary Assessments (EMAs)) (Wilhelm & Schoebi, 2007) (Figure 2). In addition to these validated tools, we are conducting semi-structured interviews and the associated thematic analyses include coding for well-being. From our review of the literature on previous built environment studies that had used these measures, most articles used composite measures of SHS or PWI, calculated by averaging individual domain scores (see below and Appendix I). In three studies using the PWI (Cummins et al., 2002; Makarewicz & Németh, 2018; Rojo-Perez et al., 2012) the researchers reported both composite and domain-specific well-being scores, enabling one to examine which aspects of well-being are most affected by transportation accessibility. For example, Makarewicz and Németh showed that transport disadvantage was linked to different domains of well-being depending on income groups (Makarewicz & Németh, 2018).

The Subjective Happiness Scale (SHS) The Subjective Happiness Scale aims to capture whether people consider themselves to be happy, accounting for cultural or social measures of happiness (health, good marriage, satisfying career etc.). The SHS tool has been validated in several settings in the US and Russia with 2,732 participants covering a range of ages from adolescents to older adults (Lyubomirsky & Lepper, 1999). Participants are asked to choose from a 7-point Likert scale with four items asking them to 1) rank their happiness (not very happy person to very happy person); 2) compare their happiness to their peers (less happy to more happy); 3) rank how well “very happy” describes them; and 4) describe how well “not very happy” describes them. The scale was created by Lyubomirsky and Lepper (1999) to fill a perceived research gap on determining if people subjectively assess themselves to be happy or unhappy. Lyubomirsky defines happiness in a later paper as “frequent positive affect, high life satisfaction, and infrequent negative affect” (Lyubomirsky et al. 2005), in line with our understanding of dimensions of subjective well-being.

The Personal Well-Being Index (PWI) was developed by the International Wellbeing Group (led by researchers Cummings and Lau) and seeks to measure the subjective dimensions of “quality of life”. It deliberately excludes affective adjectives and seeks to measure life satisfaction along seven life domains: standard of living; personal health; achievement in life; personal relationships; personal safety; community-connectedness; and future security (Cummins & Lau, 2013). Responses are given on an 11-point scale ranging from “No satisfaction at all” to “Completely satisfied,” and the overall Personal Well-being score is a sum of each domain-specific score. The Personal Well-Being Index has seen several versions since it appeared in 2002. In INTERACT, we are using the 5th edition (2013).

The Short Mood Scale (SMS), developed by Wilhelm and Schoebi (2007) and based on the Multidimensional Mood Questionnaire (Steyer et al., 1997), measures affective states along

dimensions of valence, energetic arousal, and calmness. Research teams have used this scale to measure current affective states by asking: “At this moment, I feel...” and asking participants to place a slider somewhere between the left end and the right end of a bipolar scale (e.g., unwell-well) (Bossmann et al., 2013; Giurgiu et al., 2020; Kanning & Hansen, 2017; Wilhelm & Schoebi, 2007). Specific measures cover three dimensions of affect, each of which is composed of two scales: valence (unwell vs. well, discontent vs. content), calmness (relaxed vs. tense, calm vs. agitated), and energetic arousal (tired vs. awake, without energy vs. full of energy).

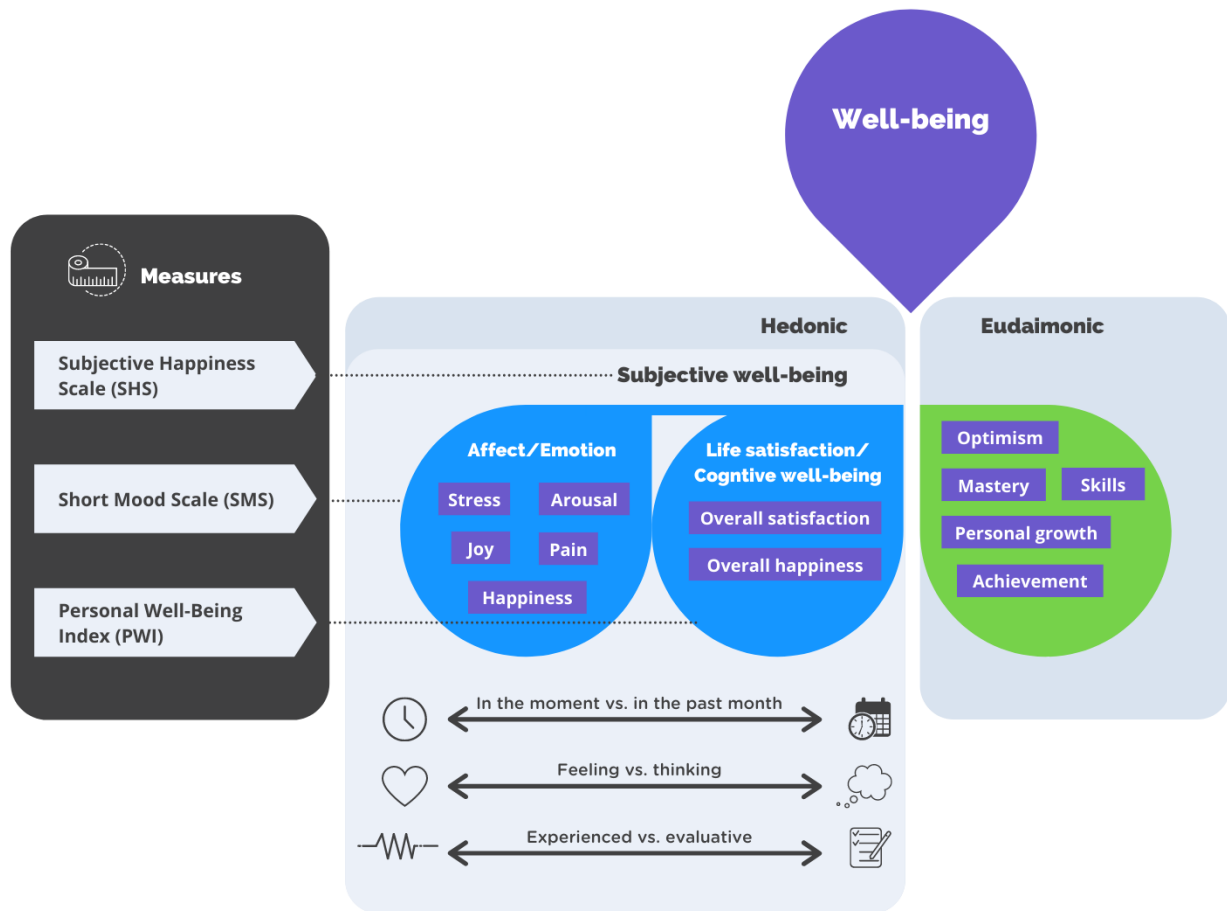


Figure 2. Dimensions of well-being with INTERACT measures

Ecological Momentary Assessment (EMA) is not a questionnaire to measure well-being per se, but a method of collecting real-time data on participants’ experiences (possibly including affective states) in their natural environment (Shiffman et al., 2008). By using a smartphone app to prompt participants EMA is used to assess individuals’ experiences, perceptions, moods, and behaviours as they occur. Specifically, the Short Mood Scale can be delivered multiple times per day via EMAs to measure affect and account for within-day variations. In INTERACT, we use EMA to gather SMS responses, capturing affect eight times

per day. Several studies have assessed within-day variations of affect (or mood) using EMAs (see summary of Ng et al., 2020; Doorley et al., 2020; Lenaert et al., 2019; in Appendix II) with the following studies specifically administering the SMS (Giurgiu et al., 2020; Kanning & Hansen, 2017; Wilhelm & Schoebi, 2007; Bossmann et al. 2013). It was possible to evaluate a person's sedentary behaviour from within-day changes in mood (Giurgiu et al., 2020), or to estimate exercise duration from within-subject variation in morning affect (Schondube et al., 2016). Determining meaningful differences in affect between people is far more challenging than evaluating within-person changes over time. Of the studies we reviewed, only Bossman et al. (2013) captured significant mood differences between groups of people while controlling for within-person changes. Specifically, after increasing their physical activity, the positive impact on mood was greater among women than men.

Built Environment & Subjective Well-being in the Literature

The impacts of built environments on well-being is an emerging area of research in recent years, reflecting an increasing interest in the influence of place on health (Hajrasoulih et al., 2018). Despite the growing pool of literature, there is as yet very little robust public health evidence to support the theory that changes to the built environment can improve well-being or quality of life (Moore et al., 2018). This lack of evidence is in part due to differences in built environment exposures and health outcomes between studies and reliance on study designs that do not measure changes over time or include comparison groups. Consequently, the results of these studies are limited in their generalizability and often do not apply to settings outside of where the study was conducted. This all contributes to a lack of consensus around whether and how the built environment impacts well-being (Hajrasoulih et al., 2018; Hunter et al., 2019; Moore et al., 2018).

In light of the lack of evidence, the INTERACT research program focuses on analyzing how changing built environments are linked to changing health outcomes, including well-being (Figure 3). To do so, we track built environment changes and use both longitudinal survey and EMA data collection tools to measure evolution in well-being among population-based cohorts in four Canadian cities. To support the work of INTERACT on well-being and better align future analyses with existing urban health literature, the next sections of this primer consider findings from studies that have measured well-being using the same tools as INTERACT—namely, the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999), Personal Wellbeing Index (International Wellbeing Group, 2013), and the Short Mood Scale using EMA (Wilhelm & Schoebi 2007) (see INTERACT survey tools, Appendix III). Select pathways and supporting literature are illustrated in Figure 3.

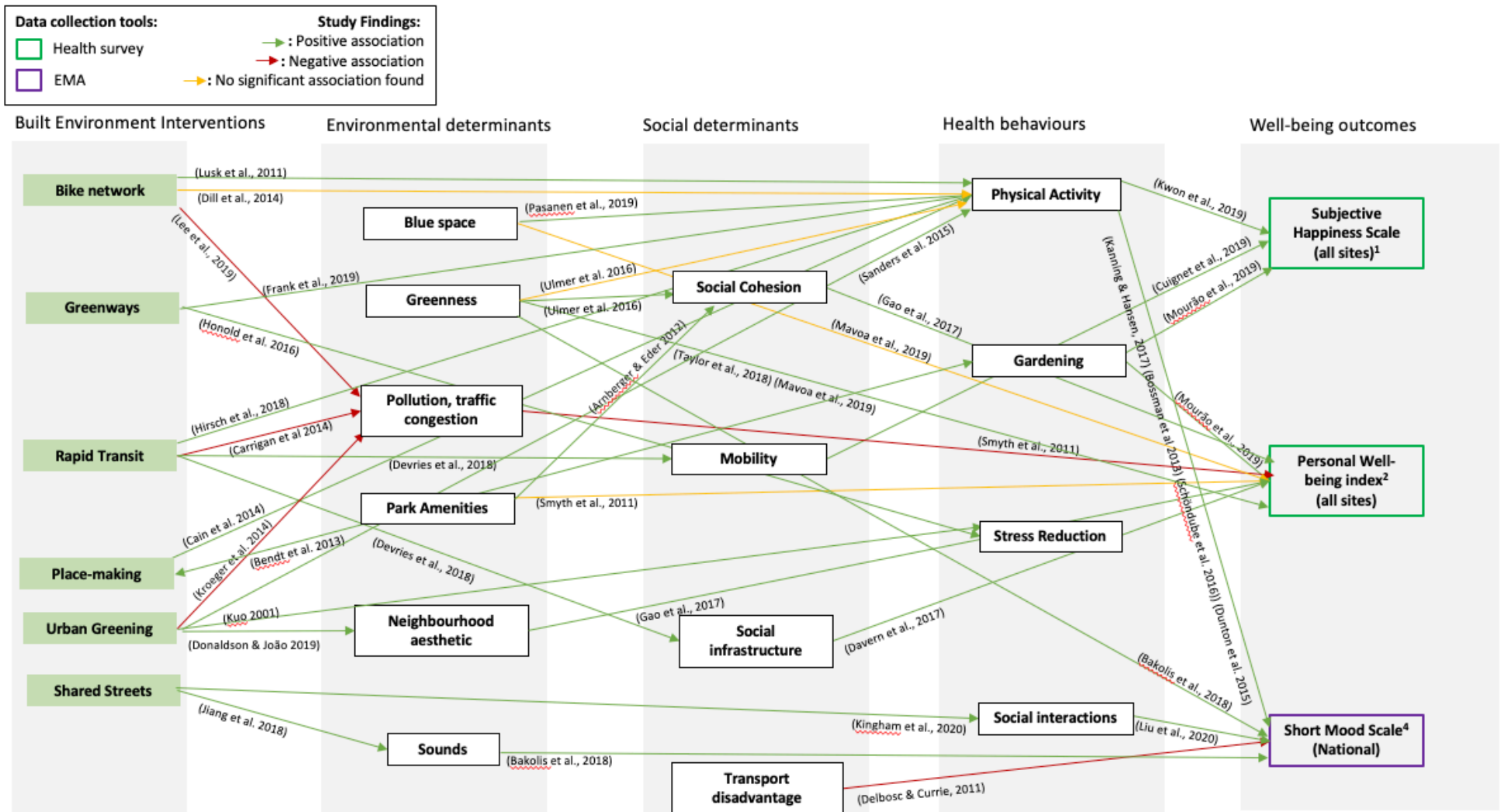


Figure 3. Illustrative pathways linking built environment interventions to subjective well-being (subjective happiness scale, short mood scale, and personal wellbeing index)

The impacts of built environment interventions on well-being measures used by INTERACT are not yet known. Our review of the literature found that studies have examined the impact of intermediaries (environmental determinants, social determinants, and health behaviours) on well-being, and other studies have linked built environment interventions to these intermediaries. For example, greenway usage was associated with more outdoor physical activity (Frank et al., 2019) and physical activity corresponded with positive mood (Dunton et al., 2015) and with greater happiness (Kwon et al., 2019) (Figure 3). In this example of three different studies, physical activity was facilitated by the greenway (built environment intervention) and acts as the intermediary between the greenway and well-being outcomes. We summarized our literature review on built environment and well-being with two example topic areas: green space and mobility. These topics were popular in our literature reviews and are frequently discussed by city planners (e.g., Vancouver 2040 Transportation Plan (City of Vancouver, n.d.)).

Green space

While evidence for a relationship between built environment interventions and well-being is generally weak, there is consensus in the literature that exposure to green space is correlated with higher levels of well-being (Hajrasoulih et al., 2018; Krefis et al., 2018; Moore et al., 2018). Positive associations were reported between PWI scores and greenness (Mavoa et al., 2019; Taylor et al., 2018). “Greenness” in these cases was assessed objectively using neighbourhood vegetation densities calculated from satellite imagery (Mavoa et al., 2019; Taylor et al., 2018) and subjectively by asking participants how much nature they were able to see from home or work (e.g. “mostly nature,” “half man-made, half nature”) (Taylor et al., 2018). Access to private green space (as opposed to public) was observed as being a particularly important predictor of subjective well-being in Australia (Mavoa et al., 2019). Additional environmental determinants such as blue space (Mavoa et al., 2019), birdsong (Bakolis et al., 2018), and access to parkland (Smyth et al., 2011) were positively associated with higher well-being, while exposure to traffic congestion and air pollution (Smyth et al., 2011) showed a negative relationship.

Mobility

Behavioural and environmental dimensions relating to mobility were also found in our review. In a study of mobility among older adults, Cuignet *et al.* (2020) showed that competences—the acquired skills, organizational capabilities, and experience with different transport modes that together influence an individual's *potential* for mobility within their activity space—are related to SHS scores. Another study showed PWI was positively correlated with the number and mix of spatially attributable social infrastructures within an individual's neighbourhood, including community and public transport options (Davern et al., 2017). There is also emerging evidence to suggest that transportation disadvantage may be related to lower PWI. Transportation disadvantage is measured as the frequency of difficulties in accessing activities due to poor neighbourhood walkability or low public transit availability (Currie et al., 2010; Delbosc & Currie, 2011), with larger effect sizes

observed for disadvantaged populations (Currie et al., 2010). Likewise, Stanley *et al.* (2011) reported a relationship between increased mobility (e.g. number of trips in a day) and higher PWI scores, which they suggested could be mediated by a reduced risk of social exclusion; this is contrary to Delbosc and Currie's finding of small and inconclusive correlations between transport disadvantage and social exclusion (2011). Makarewicz and Németh (2018) also found that access to multiple modes of transportation was associated with higher PWI domains of community connectedness and standard of living across all income groups.

The relationship between active transportation (walking and other forms of physical activity) and the built environment and well-being has been well-studied. Many built environment interventions such as greenways (Frank et al. 2019), bike networks (Lusk et al., 2011), rapid transit networks (Hirsch et al. 2018), and place-making efforts (Cain et al., 2014) all had positive effects on increasing physical activity. In turn, there is a positive relationship was found between physical activity and well-being using the SMS (Kanning & Hansen, 2017; Bossman et al., 2013; Schondube et al., 2016; Dunton et al., 2015). In addition, the perceived walkability of a neighbourhood—along with neighbourhood aesthetics—was associated with high PWI scores, potentially mediated through its influence on health behaviours such as physical activity (Gao et al., 2016; Kwon et al., 2019). In addition, in terms of links between social environments and well-being socially cohesive neighbourhoods were shown have a positive impact on well-being in older adults (Gao et al. 2017) as in communities with accessible social amenities and services ("social infrastructure") (Davern et al. 2017).

Conclusion

The INTERACT research program is positioned to address gaps in understanding how changes to the built environment influence well-being. To understand how built environment changes influence subjective well-being and who they benefit, we are using longitudinal surveys, EMA data collection, and qualitative interviews in four Canadian cities. We capture subjective well-being using measures of Personal Well-being Index, Subjective Happiness Scale, and Short Mood Scale. Within INTERACT, we can examine research questions such as how physical activity and well-being change over time, and how well-being varies based on the amount of time people spend using the new greenway or cycling on new bicycle infrastructure. Results of our program provide city planners with insights into how built environment changes impact population health in order to build healthy and equitable cities.

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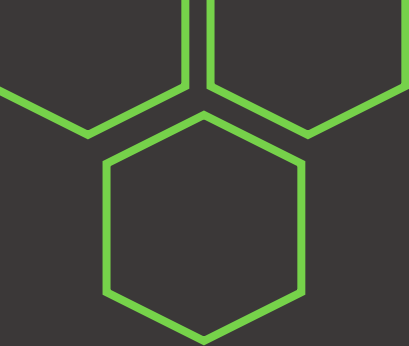
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APPENDIX



Appendix I

INTERACT Well-being Primer – Literature Review Outline

The aim of this review is to summarize key findings from the literature on the relationships between built environment and well-being. Given the wide range of definitions and measurement tools for both variables, this review is specifically concerned with studies that use the same well-being measurement instruments as those used in INTERACT's health survey: The Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) and Personal Well-being Index (International Wellbeing Group, 2013). Relevant literature was identified using the following search strategies:

1) Pubmed and MEDLINE Web of Science databases:

("subjective happiness scale" OR "general happiness scale" OR "global happiness scale" OR "personal well-being index" OR "personal wellbeing index" OR "Australian unity well-being index" OR "Australian unity wellbeing index" OR "PWI-A") AND (((built OR urban OR neighbourhood OR neighborhood) AND (environment OR health OR intervention OR planning OR characteristic OR attribute)) OR "physical environment" OR ((healthy OR active) AND cit*) OR "green space" OR "greenspace" OR "greenway" OR "greenery" OR "greenness" OR "blue space" OR "bluespace" OR ((transportation OR walking OR cycling) AND corridor) OR "multi-use path" OR "transportation" OR "accessibility")

56 articles were returned from this search. A scan of abstracts identified only one relevant study.

2) Google Scholar:

Within citations for the PWI (Cummins et al., 2002) and SHS (Lyubomirsky & Lepper, 1999) instruments:

((built OR urban OR neighbourhood OR neighborhood) AND (environment OR health OR intervention OR planning OR characteristic OR attribute)) OR "physical environment" OR ((healthy OR active) AND cit*) OR "green space" OR "greenspace" OR "greenway" OR "greenery" OR "greenness" OR "blue space" OR "bluespace" OR ((transportation OR walking OR cycling) AND corridor) OR "multi-use path" OR "transportation" OR "accessibility")

455 articles were returned. After screening abstracts and titles for relevancy, an additional 16 studies were included in the review.

Articles were excluded for the following reasons:

- feasibility studies not examining outcomes,
- not using SHS or PWI to measure well-being,
- not concerned with built environment interventions

The following review broadly summarizes the state of evidence for built environment's impact on subjective well-being, outlines trends in built environment-well-being research for studies that incorporate SHS or PWI specifically, and considers what other outcomes or health determinants are being used in these studies.

Built Environment and Subjective Happiness Scale (SHS) Table

Author, year	Research question	Sample	Well-being measurement tool(s) used	Built environment measure/intervention	Other health determinants measured	Main findings
(Cuignet et al., 2020)	How does mobility – and more specifically, motility and movement – influence the hedonic and eudaimonic components of well-being among older adults?	448 older adults Luxembourg	<p>1. <i>Hedonic WB</i>: (a) subjective happiness: SHS (composite score) (b) depression: geriatric depression scale (c) emotional WB: SF-36 emotional WB score (d) vitality: SF-36 energy/fatigue score</p> <p>2. <i>Eudaimonic WB</i>: (a) depression: geriatric depression scale (b) social contacts: score of social section of LuxCohort (c) role limitations: SF-36 role of limitations due to emotional problems score (d) social functioning: SF-36 social functioning score</p>	<p>1. Motility components: (a) Access (=destination density, road jxn density, pub transit station density, pub transit freq) (b) Competences (=physical fxning, driving licence, internet access, transport experience), (c) Appropriation (=transport experiences, number of activities, number of trips), (d) Attitudes about transport modes</p> <p>2. Movement: (a) Number of trips (b) Daily travel time (c) Activity space area</p>	individual and household characteristics, health, activities	<p>1. Motility has direct effects on eudaimonic WB and (to a lesser extent) hedonic WB, partially mediated by movement</p> <p>2. Access impacts WB only through movement, suggesting that greater access increases the number of activities within a short distance</p>

(Kwon et al., 2019)	What are the impacts of neighbourhood features on well-being, happiness and life satisfaction?	1392 adults USA	<p>1. <i>Happiness</i>: SHS (composite score) (excluded: "some people are not very happy...To what extent does this characterize you?")</p> <p>2. <i>Life satisfaction</i>: Satisfaction with life scale</p> <p>Recreational WB: comprised of social interaction, active recreation and observational recreation</p>	<p>1. Perceived and objective walkability:</p> <p>(a) access to services</p> <p>(b) comforts in walking</p> <p>2. Neighbourhood safety (a) crime safety</p> <p>(b) traffic safety</p> <p>3. Neighbourhood appearance</p> <p>(a) upkeep</p> <p>(b) attractiveness</p>	gender, age, race, marital status, work status	<p>1. Perceived (but not objective) walkability and neighbourhood appearance (upkeep and attractiveness) played a significant role in increasing recreational WB</p> <p>2. Recreational WB was positively associated with physical WB</p> <p>3. Physical WB was positively associated with happiness and life satisfaction</p>
(Mourão et al., 2019)	What is the contribution of urban organic allotment gardens to happiness and well-being of urban populations?	65 adult gardeners Portugal	<p>1. <i>Affective WB</i>: SHS (Portuguese equivalent) (composite score)</p> <p>2. <i>Cognitive WB</i>: personal well-being index (Portuguese equivalent)</p>	Urban gardens	gender, age, marital status, educational level, professional activity, household composition, income, type of housing, parish of residence, professional activity	<p>1. Gardeners who visited AG more often considered themselves happier than those who visited less often</p> <p>2. Life satisfaction (measured by the PWI) among gardeners was higher than the average value for the</p>

(Amorim et al., 2017)	Does the area -- urban or rural -- in which retirees live help or harm their feelings of happiness? What is the difference in retirees' perceptions from each area?	279 retirees Brazil	<i>Happiness: SHS</i> (Portuguese equivalent) (composite score)	Rural/urban setting	Social support, diversity of activities in retirement, economic satisfaction of retirement, self-perceived health, sociodemographic characteristics: age, sex, education, marital status, residency situation	1. Retirees in the urban area had higher levels of subjective happiness than those in the rural area 2. Good finances and health, as well as proximity to friends, family and partners were positively associated with subjective happiness levels 3. No evident relationship between diversity of activities and happiness
(Heilmayr, 2017)	Does participation in community gardening improve well-being and health beyond other	110 college students USA	1. <i>Happiness: SHS</i> (composite score) 2. perceived stress scale 3. self-efficacy scale (from NIH toolbox)	Community gardens	Physical activity, fruit and vegetable consumption, personal characteristics:	1. All experimental conditions were associated with improved emotional WB, conscientiousness, social relationships,

comparable
interventions?

4. *Affective WB*: Positive
and negative affect
schedule

5. *Mental WB*: Global
Mental Health
component of Global
Health Short Form

sex, age, ethnicity

environmental
identity and self-
reported health
2. No significantly
different effect of
community
gardening over other
experimental
conditions was
observed

Built Environment and Personal Well-Being Index (PWI) Table

Author, year	Research question/aim	Sample	Outcome measures	Built environment measure/intervention	Other health determinants measured	Main findings
(Cummins et al., 2002.)	To confirm the integrity of the Personal and National Wellbeing Indices, and to compare Australian scores by age, geographical location , recent life events (happy/sad) and gender.	2000 adults Australia	1. <i>Personal WB</i> : PWI (composite and disaggregated scores) 2. <i>National WB</i> : National well-being index (composite and disaggregated scores)	Rural/urban setting	Age, gender, recent life events (happy/sad), Accessibility/Remoteness Index of Australia (a measure of remoteness that excludes socio-economic, urban/rural and population size factors)	1. People in rural areas were more satisfied with their personal lives (but less satisfied with the national situation) than city-dwellers 2. People who had recently experienced a strong positive event had higher well-being , while those who had recently experienced a strong negative event evidenced low-normal WB 3. Females were generally more satisfied with their lives as a whole and most of the personal life domains than males
(Mourão et al., 2019)	What is the contribution of urban organic allotment gardens to happiness and well-being of urban populations?	65 adult gardeners Portugal	1. <i>Affective WB</i> : SHS (Portuguese equivalent) (composite score) 2. <i>Cognitive WB</i> : personal well-being index (Portuguese equivalent)	Urban gardens	gender, age, marital status, educational level, professional activity, household composition, income, type of housing, parish of residence, professional activity	1. Gardeners who visited AG more often considered themselves happier than those who visited less often 2. Life satisfaction (measured by the PWI) among gardeners was higher than the average value for the Portuguese population

(Smyth et al., 2011)	What is the relationship between atmospheric and water pollution, traffic congestion, access to parkland and personal well-being?	2741 working adults China	PWI (composite score)	1. atmospheric and water pollution 2. traffic congestion, 3. access to parkland	Job satisfaction, personal characteristics: age, education, gender, marital status, no. children, avg monthly income	1. In cities with higher levels of atmospheric pollution and traffic congestion, respondents report lower levels of PWB 2. Relationship between parks and PWB was not significantly significant
(Davern et al., 2017)	What is the relationship between spatial accessibility to social infrastructure and subjective well-being ?	7141 adults 18+ in metro Melbourne Australia	<i>Life satisfaction: PWI (composite score)</i>	Mix of and distance to social infrastructure services, including: (a) community centres (b) cultural and leisure services (c) schools (d) health and social services (e) sport and recreational services	gender, age, household structure, children, education level, income, language, dwelling density	1. Results suggested that a mix of social infrastructural services available within 800m was most beneficial to SWB 2. Findings provide support to the concept of "20-minute cities" for improved public health

(Taylor et al., 2018)	Does exposure to nature benefits urban residents' wellbeing in major cities of Oceania?	1819 urban residents aged 18+ from Auckland (n=159), Wellington (n=85), Melbourne (n=700), Sydney (n=875) Australia and NZ	1. Personal well-being PWI (composite score): religion/spirituality and personal relationships questions omitted; "general life satisfaction" question included. 2. General well-being: 5-item WHO self-reported WB index 3. Psychological well-being 7-item psychological WB instrument	Biodiversity: (a) avian species richness (b) normalized difference vegetation index (c) nature viewed from home and work	demographics: age, gender, marital status, household composition, duration of residence, no. bedrooms in residence, highest level education, first language	1. Nature in proximity to where people spend most of their time (e.g. at home, at work) and vegetation in their postcode (NDVI) were associated with well-being in Australian cities (primarily) and -- to a lesser extent -- Auckland (but not Wellington) 2. Neither general WB nor personal WB were correlated with bird species richness
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(Mavoa et al., 2019)	What is the relationship between subjective well-being and objective measures of greenness, biodiversity and blue space?	4912 adults in metro Melbourne Australia	PWI (composite score)	<p>1. Blue space:</p> <p>(a) distance to coast</p> <p>(b) % area in water</p> <p>2. Greenness:</p> <p>(a) NDVI calculated from satellite data</p> <p>3. Biodiversity:</p> <p>(a) fauna and flora species richness</p>	sex, age, income, education, work status, household structure, neighbourhood index of Socioeconomic disadvantage, greenspace visit frequency	<p>1. Greenness: NDVI was positively associated with SWB at all neighbourhood scales, with small but meaningful effect sizes observed. Living in greener neighbourhoods is significantly associated with higher levels of SWB, with the magnitude of this relationship increasing with neighbourhood size. Private greenspace (as opposed to public) was found to be particularly important. Participants who visited greenspaces at least once per week had higher SWB scores than those who visited less frequently</p> <p>2. No other measures of the natural environment (bluespace, biodiversity) were significantly associated with SWB</p>
(Delbosc & Currie, 2011)	How do differences in geographic location influence transport disadvantage, which may in turn influence	784 adults in metro Melbourne, 336 of which were	<p>1. Personal well-being: PWI (composite score)</p> <p>2. Life satisfaction: Satisfaction with</p>	<p>Transport disadvantage (TD):</p> <p>(a) Neighbourhood walkability</p>	fuel prices, social exclusion (= income, unemployment, political engagement, community participation, social	<p>1. TD – when experienced – was more likely to have an impact on well-being if individual lived in a rural (as opposed to urban) area</p> <p>2. Correlations between TD and social exclusion were</p>

	social exclusion and well-being?	considered "disadvantaged individuals"	Life Scale 3. Pos and neg emotions: Positive and Negative Affect Schedule	(b) public transit availability (c) Realised travel: average daily travel per person per day (d) mode split (e) difficulty in accessing activities due to transport issues	support), demographics: sex, age, birth country, household composition, work status, education	small and inconsistent 3. Geographic location (e.g. rural vs urban) alone did not make people more or less satisfied with life
(Currie et al., 2010)	What is the relationship between transport disadvantage, social exclusion and well-being?	535 adults in Melbourne Australia	1. Personal well-being: PWI (composite score) 2. Life satisfaction: Satisfaction with Life Scale 3. Pos and neg emotions: Positive and Negative Affect Schedule	Transport disadvantage (TD): (a) Neighbourhood walkability (b) public transit availability (c) Realised travel: average daily travel per person per day	fuel prices, time poverty , car ownership, social exclusion (= income, unemployment, political engagement, community participation, social support), demographics: sex, age, birth country, household composition, work status, education	1. Time poverty is associated with TD in both socially advantaged and disadvantaged groups – though <i>not because of lack of transport</i> – which is associated with reductions in well-being 2. Correlations between self-reported TD, social exclusion and well-being were insignificant; however, individuals who are “vulnerable/impaired” tend to score more poorly on

			4. Social exclusion	(d) mode split (e) frequency of difficulty in accessing activities due to transport issues		social exclusion and WB scales 3. Those with low well-being have similar levels of transport difficulties but substantially higher reporting of activities which cannot be undertaken due to transport problems.
(Stanley et al., 2011)	What is the relationship between a person's travel patterns, their risk of social exclusion and self-assessed well-being?	535 adults in Melbourne Australia	1. <i>Personal well-being</i> : PWI (composite score) 2. <i>Social exclusion</i> : Risk of social exclusion tool (SOCEX)	Mobility (# trips in a day)	Sociodemographic data, sense of community, contact with family members, trust in people	1. Significant association between increased mobility (trip making/activities undertaken) and reduced risk of social exclusion, which in turn is related to well-being 2. The connection between social exclusion and well-being is stronger in the rural than urban sample.
(Makarewicz & Németh, 2018)	How does the ability to use multiple transportation options affects one's subjective well-being (SWB), including aspects such as physical health, financial security, standard of living,	232 residents of metro Denver USA	PWI (composite and disaggregated scores)	1. <i>transportation accessibility</i> : measured as travel behaviour, e.g. how respondents travel to 12	personal characteristics: demographic and SES data, residential location, housing type	1. Across income groups, multimodal respondents indicate a higher standard of living and connection to communities than those with worse access 2. For middle income group, multi-modal travel is associated with higher SWB scores on physical health

and personal
relationships?

frequent
destinations:

(a) modal-
dependent

(b) semi-
multimodal

(c) multi-modal

2. urban form
type:

(a) suburban

(b) urban
neighbourhood

(c) urban core

and satisfaction with
achievements in life
3. For high income
respondents, multimodal
travel has no impact on
overall SWB or any of its
constituent variables
4. For all respondents,
owning a vehicle is positively
associated with higher levels
of overall SWB, standard of
living, health, achievements
5. The richer the respondent,
the higher they scored their
overall and disaggregated
SWB, regardless of travel
behaviour or where they live
6. After controlling for
income, the only association
between place and SWB was
for low-income participants,
where residents of urban
core neighbourhoods were
more satisfied with their
standard of living than
others
7. Multimodal respondents
were more likely to live in
urban locations

(Nepomuceno et al., 2016)	What is the relationship between mental health and well-being in rural and urban Brazilian contexts marked by poverty?	417 residents of poor urban and rural districts Brazil	1. Personal Well-being: PWI (composite score) 2. Mental health: SRQ-20	Rural/urban setting	demographic data: age, gender, type of community, income, religion, education	1. WB was higher for those in the rural sample 2. WB was not associated with income 3. Mental distress was more prevalent in the urban sample and associated with lower income
(Rojo-Perez et al., 2012)	What factors are associated with personal well-being and satisfaction with life in older adults?	1357 adults aged 50+ living in family housing Spain	<i>Subjective wellbeing: PWI</i> (Spanish equivalent), with spirituality/religion and satisfaction with life as a whole questions included (composite and disaggregated scores)	1. Municipality density 2. Activities in the residential and social environment 3. Home and neighbourhood characteristics	Socio-demographic characteristics and economic sources: sex, age, marital status, household size, level of education, relationship with current activity status, social status, household economic perception; Health, physical and cognitive functioning: self-perception of health, number of chronic medical conditions, functional ability, cognitive deterioration, depression, pos and neg feelings;	1. BE variables had no statistically significant relationship to WB 2. Spirituality score on PWI had very low correlation with overall PWI and other individual scores

					Frequency of leisure and social activities; Family and social networks and support; Residential environment	
(Gao et al., 2017)	What is the impact of neighbourhood social cohesion, social interaction, aesthetic quality and walkability on SWB among Chinese elderly?	2719 Shanghai residents over the age of 65 China	<i>Subjective wellbeing: PWI</i> (Chinese equivalent) (composite score)	Neighbourhood attributes: (a) physical: aesthetic quality and walkability (b) social: social interaction with neighbours and social cohesion	demographic characteristics: sex, age, marital status, education; years living in neighbourhood, self-rated health, co-morbidities, leisure-time, physical activity	1. Perceived aesthetic quality of one's neighbourhood (both at the individual and neighbourhood level) was associated with high SWB 2. Perceived social cohesion and interaction (at the individual level only) were positively associated with SWB

Appendix II

INTERACT Well-being Primer – EMA Literature Review

The aim of this review is to assess how data collection methods impact well-being assessment. We provide insights from recent articles that measure well-being using Ecological Momentary Assessment (EMA) methods.

The article search for this review consists of two strategies:

- 1) Review of articles included in Wasfi (2018) review on well-being, and
- 2) MEDLINE Web of Science database: ("Ecological Momentary Assessment*") AND (wellbeing OR well-being). This search was limited to the past 5 years based on technology advancements and relevance. 71 articles were returned from this initial search. 14 of the most recent and relevant articles are included in this review.

Articles were excluded for the following reasons:

- feasibility studies not examining outcomes,
- not examining well-being in any way, or
- outdated study.

We conducted a quick scan with the following search strategy to make sure no important articles were missed that were spatially-linked or had location data in them: ("Ecological Momentary Assessment*") AND (wellbeing OR well-being) AND (geofence* OR location OR spatial).

The purpose of this review is to provide a framework and scope of what is currently being done in the EMA research realm on the topic of well-being and health. We will outline the different outcomes assessed in the current EMA literature, discuss the specific triggers of various EMA surveys, outline how researchers are assessing location with their EMA studies, and outline the different models of analysis.

Table 1 - EMA and Well-being

Author, year	Specific measures	Specific questions	How was it modelled/ analyzed	Temporal measure	GPS	EMA trigger
Winter et al. 2020	<p>Affect was measured in text messages four times a day. Affective dynamics was calculated.</p> <p>Baseline survey: Flourishing Scale (Diener et al., 2010) consists of 8 Likert-scale score ranging from 8 (lowest psychological well-being) to 56 (highest psychological well-being)</p>	<p>Momentary affect: "Right now, how are you feeling?", with responses 1= not at all to 9= extremely for the two affective word prompts: positive and negative.</p>	<p>After calculating the six indices of affective dynamics in R, they grouped participants with similar dynamic measures using LPA with Bayesian regularization.</p> <p>Observations nested within participants and each group (latent class). All outcome variables and predictors standardized within each group prior to analysis.</p>	<p>Not in model - daily average. However, measured 4x per day for 15 days.</p>	No.	Time-based trigger. 4x per day.
Giurgiu et al. 2020	<p>Short version of the Multidimensional Mood Questionnaire (MDMQ) presented on visual analog scales (0-100) in reversed polarity and mixed order. This six-item short-scale captured three basic mood dimensions: valence, energetic arousal, and calmness. They measured sedentary behaviour continuously.</p>		<p>First model, participants' mean sedentary time, and average value of all e-diary mood assessments for the dimensions valence [0-100], energetic arousal [0-100], and calmness [0-100].</p> <p>Second model, self-reported sedentary behavior (GPAQ), with WHO-5 Index [0- 100] and further predictors such as age [years], BMI [kg/m2], sex.</p>	<p>Yes - measured within-person, within-day. Measures every 40 to 100 minutes</p>	No.	Time and sedentary PA triggers.

Sladek et al. 2020	Perceived stress, daily rumination, PA	<p>Perceived stress (4-5x/day): "briefly describe the most stressful situation that occurred in the last hour and rate its severity (0 = not at all stressful to 4 = very stressful)"</p> <p>Once daily rumination: ""Overall today, how much did you focus on your problems/stress?"" from 1 (not at all) to 4(a lot)"</p>	Multilevel models fit separately for sleep outcome (sleep onset latency, duration; N= 488 days nested within 61 individuals). Continuous Level 1 (day-level; L1) predictors were within-person (i.e. individual's average of available scores subtracted from each daily score), and Level 2 (person-level; L2) variables were grand- mean centred	Daily score - within-day measures not applicable. They measured perceived stress 4-5 times per day, but created an average measure.	No.	Time based
Liu et al. 2020	Current affective state	<p>Momentary affective state: rating the extent to which they felt quiet, happy, calm, sad, excited, alert, anxious, irritated, or sleepy on 5-point scales (1 = not at all to 5 = very much).</p> <p>Characteristics of social contact: ""please indicate to what extent you felt satisfied with this reported social contact." The responses could range from 0 = "not at all satisfied" to 9 = "totally satisfied."</p>	"Series of multivariate multilevel models to accommodate the nested nature of the data: the reported social contacts (Level 1) were nested within days (Level 2) and days were nested within persons (Level 3). Following usual practice in EMA data, the repeated measures of contact satisfaction and affect were conceived as having time-varying and time-invariant components and split accordingly."	No - Created overall day score for models. However, measured approx every 2 hr between 8:00 a.m. to 10:00 p.m.	No.	Time based

Doorley et al. 2019	Happiness, Anxiety, Sense of Belonging, Social Approach. Participants also recorded their best (most positive) event in the past hour with a brief, one-to-three-word response. <i>Not specific well-being measures, but created emotional scales.</i>	Happiness (cheerful, happy, joyful), anxiety (anxious, nervous, worried), sense of belonging (acceptance, connectedness), and social approach/avoidance motivation (want to be with other people, want to be alone) were rated using 1 (not at all) to 5 (very) scale.	For primary analyses, data were hierarchically nested in two-level models with momentary observations (Level 1) nested within people (Level 2).	Yes - momentary observations, nested within people. 10 text messages per day. Between 8:30 a.m. and 11:00 p.m., with 1 to 2 hr gaps.	No.	Time based
Ng et al. 2020	Participants rated their positive and negative mood during the prior 3 hr.	Pleasantness of encounter: "How pleasant was this interaction for you?" Participants rated each encounter from 1 (unpleasant) to 5 (pleasant)." Stressful experiences: "Did you discuss anything that might be considered stressful or unpleasant?" Participants answered 1 (yes) or 0 (no)."	Multilevel models to account for encounters with different social partners (level 1) being nested within 3-hr assessment intervals (level 2), and within participants (level 3).	Yes - modeled within days and person. (EMA) surveys every 3 hr for 5 to 6 days	No.	Time based

Mood: four positive mood items (i.e., calm, love, content, proud) and five negative mood items (i.e., nervous/worried, irritated, bored, lonely, sad) described them on a scale from 1 (not at all) to 5 (a great deal).

Lenaert et al. 2019	Positive and negative affect (guided in part by the Positive and Negative Affect Scale (PANAS))	Current mood (positive/negative affect, e.g., "I feel down"), Self-esteem (e.g., "I like myself"), Physical well-being (e.g., "I am tired"). 7-point Likert scales.	Momentary and temporal relationships between physical activity, fatigue, and NA, multilevel regression and time-lagged multilevel analyses. xtmixed module in STATA version 12.1. The matrix of choice was covariance (unstructured) to account for the degree of within-subject co-variance inherent to the ESM data.	Yes - multilevel regression models, testing within-person changes. 10/day for 6 days.	Yes - but location not the trigger for EMA.	Time based, semi-random schedule
Bakolis et al. 2018	(1) an individual's perception of their surrounding environment ; (2) an individual's geographical location using GPS-based geo-tagging; (3) an individual's	Nature features: "Are you indoors or outdoors? Can you see trees? Can you see the sky? Can you hear birds singing? Can you see or hear water? Do you feel in contact with nature? Possible answers	"Longitudinal associations between self-reported environmental features of interest and momentary mental well-being were investigated using random intercept linear models and expressed as mean	Yes - looked at each point in the model, did not create daily average. 7 EMA per	Yes - but location not the trigger for EMA.	Time based

	momentary mental well-being.	to each question included yes, no, and not sure."	differences of momentary mental well-being."	day, for 7 days		
		Warwick-Edinburgh Mental Well-being Scale Used for Ecological Momentary Assessment of Mental Well-being: 14 item scale, likert 1-5 with "Right now..."				
Kanning, M. & Hansen, S., 2017	Short Mood Scale , based on the Multidimensional Mood Questionnaire. Measured affective states (Valence, energetic arousal and calmness). Also measured autonomy, competence, and relatedness (specific questions in full-text)	Affective states: ""At this moment, I feel..." by moving a slider from the left end (e.g., unwell) to the right end (e.g., well) of a bipolar scale. Measured: valence (unwell vs. well, discontent vs. content), calmness (relaxed vs. tense, calm vs. agitated), and energetic arousal (tired vs. awake, without energy vs. full of energy).	Multilevel, within-person. Step-up approach (for affect model tested to separate variance into within and between subject sources).	Yes - measured within-person.	No.	Physical activity thresholds: 220 milli-g and 10 milli-g (moving average), measured with accelerometer
Bossmann & al., 2013	Short Mood Scale , based on the Multidimensional Mood Questionnaire. Measured affective states (Valence, energetic arousal and calmness).	Affective states: ""At this moment, I feel..." by moving a slider from the left end (e.g., unwell) to the right end (e.g., well) of a bipolar scale. Measured: valence (unwell vs. well, discontent vs. content),	"The AA approach produced repeated measurements of PA and affective states (level-1) that were nested within persons (level- 2)"	Yes - measured within-person and between person	No.	Time based

	Measure PA with accelerometer continuously.	calmness (relaxed vs. tense, calm vs. agitated), and energetic arousal (tired vs. awake, without energy vs. full of energy).				
Dunton et al., 2015	Measured affect through EMA: 2 dimensions of affect (4 items) posited by the circumflex model: valence (pleasure vs displeasure) and arousal (activation vs deactivation) . Study also measured activity level (level with accelerometry, what they were doing) and social and physical context (alone, if no, with who and where).	Social context: "Participants were asked to answer either "yes" or "no" to indicate whether they were alone." Physical context: "Participants were also asked, "WHERE were you just before the beep went off?"" Affect: valence (pleasure vs displeasure) and arousal (activation vs deactivation).	"Multilevel models tested whether momentary activity level moderated the association of being alone (vs. with other people) and being outdoors (vs. indoors) with concurrent affective state. Random intercepts models were estimated. Between-subjects and within-subject versions (i.e., partitioning the variance) of the main effects were generated"	Yes - Momentary data analyzed - not combined into daily mean. 8 EMA per day, randomly prompted.	Yes – but location not the trigger for EMA.	Random
Wilhelm & Schoebi, 2007	Short Mood Scale , based on the Multidimensional Mood Questionnaire. Measured affective states (Valence, energetic arousal and calmness):	Affective states: "'At this moment, I feel..." by moving a slider from the left end (e.g., unwell) to the right end (e.g., well) of a bipolar scale. Measured: valence (unwell vs. well, discontent vs. content), calmness (relaxed vs. tense, calm vs. agitated),	"We used multilevel analyses to investigate the variance and co- variance of the mood items. With MLMs, confirmatory factor analyses (CFA) and regression models can be computed simultaneously for the within- and the	Yes - within and between person analysis. 4x per day for 7 days	No.	Time based

		and energetic arousal (tired vs. awake, without energy vs. full of energy).	between-person part of the data."			
Liao, Y. & al., 2017	Affective responses during PA measured with EMA data from baseline. (valence and arousal) Physical activity (see full-text for Qs)	Affective state: Circumplex model "The positive affect scale included items that represent activated (happy, cheerful) and deactivated (calm or relaxed) pleasure. The negative affect scale included items that represent activated (anxious, stressed) and deactivated (depressed, angry) displeasure."	"Difference scores were calculated to determine change in daily MVPA minutes from baseline to 6 months and baseline to 12 months. Linear regression analyses tested these change scores as the outcomes with average affective states during EMA-reported physical activity at baseline as the predictors"	Yes - each activity assessed with affect individually	No.	Physical activity trigger.
Fritz et al., 2017	Stress and everyday activities	Stress and activities: "what they were doing, who they were with, level of perceived stress, and reasons for stress. 2hr prior to the alarm (covering the 11 a.m., 3 p.m., and 7 p.m. time periods).	Looked at stress scales, and what caused stress.	No - looked at stress and what caused it generally. No large models. However, was asked about stress 4x per day	Yes – but location not the trigger for EMA. Participant provide	Time based

		"If you feel stress right now, please tell us why?"			GPS coord.	
Schöndube et al. 2016	Short Mood Scale , based on the Multidimensional Mood Questionnaire. Measured affective states (valence, energetic arousal and calmness):	Affect and exercise duration: Using an electronic diary to deliver the SMS as an EMA 4 times per day over 20 work days to 60 participants. Participants were asked how many minutes they exercised each day.	Examined the bidirectional relationship between affect and exercise in daily life. Found positive affective valence was positively associated with exercise duration on a day level. Energetic arousal in the morning predicted subsequent exercise duration that day. Exercise duration predicted higher positive valence in the evening.	4x per day for 20 work days	No.	Time-based trigger. 4x per day.

Appendix III: Well-being questions from INTERACT surveys

The Subjective Happiness Scale (SHS) - Lyubomirsky and Lepper (1999)

	English	French
gwb_a	In general, I consider myself:	Dans l'ensemble, je me considère une personne :
	1 Not a very happy person	1 Pas du tout heureuse
	2	2
	3	3
	4	4
	5	5
	6	6
	7 A very happy person	7 Très heureuse
gwb_b	Compared with most of my peers, I consider myself:	Comparativement à la plupart de mes pairs, je me considère comme une personne :
	1 Less happy	1 Moins heureuse
	2	2
	3	3
	4	4
	5	5
	6	6
	7 More happy	7 Plus heureuse
gwb_c	Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out	Certaines personnes sont généralement très heureuses. Elles apprécient la vie indépendamment

	of everything. To what extent does this characterization describe you?	de ce qui se passe, en profitant au maximum de tout. Dans quelle mesure correspondez-vous à cette description?
	1 Not at all	
	2	
	3	1 Pas du tout
	4	2
	5	3
	6	4
	7 A great deal	5
		6
		7 Beaucoup
gwb_d	Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?	Certaines personnes ne sont pas très heureuses généralement. Bien qu'elles ne soient pas déprimées, elles ne semblent jamais aussi heureuses qu'elles pourraient l'être. Dans quelle mesure correspondez-vous à cette description?
	1 Not at all	
	2	1 Pas du tout
	3	2
	4	3
	5	4
	6	5
	7 A great deal	6
		7 Beaucoup

The Personal Well-Being Index (PWI) - International Wellbeing Group

	English	French
	Thinking about your own life and personal circumstances, how satisfied are you...	En réfléchissant à votre vie et à vos circonstances personnelles, à quel point êtes-vous satisfait(e) ...
pwb_a	With your life as a whole?	de votre vie de façon globale?
pwb_b	With your standard of living?	de votre niveau de vie?
pwb_c	With your health?	de votre santé?
pwb_d	With what you are achieving in life?	de ce que vous accomplissez dans la vie?
pwb_e	With your personal relationships?	de vos relations personnelles?
pwb_f	With how safe you feel?	de votre sentiment de sécurité?
pwb_g	With feeling part of your community?	de votre sentiment d'appartenance à la communauté?
pwb_h	With your future security?	de votre sentiment de sécurité quant à l'avenir?
pwb_i	With your spirituality or religion?	de votre spiritualité ou religion?
Response options	0. Completely dissatisfied 1. 2	0. Complètement insatisfait(e) 1. 2

for all items	3	3
	4	4
	5.	5.
	6	6
	7	7
	8	8
	9	9
	10. Completely satisfied	10. Complètement satisfait(e)

The Short Mood Scale (SMS), developed by Wilhelm and Schoebi (2007)

	English	French
	At this moment, I feel:	Je me sens présentement :
mood_a	1 Unwell	1 Mal
	2	2
	3	3
	4	4
	5	5
	6 Well	6 Bien
mood_b	1 Content	1 Content(e)
	2	2
	3	3
	4	4
	5	5
	6 Discontent	6 Mécontent(e)
mood_c	1 Agitated	1 Agité(e)
	2	2
	3	3

	4	4
	5	5
	6 Calm	6 Calme
mood_d	1 Relaxed	1 Détendu(e)
	2	2
	3	3
	4	4
	5	5
	6 Tense	6 Tendu(e)
mood_e	1 Tired	1 Fatigué(e)
	2	2
	3	3
	4	4
	5	5
	6 Awake	6 Alerte
mood_f	1 Full of energy	1 Plein(e) d'énergie
	2	2
	3	3
	4	4
	5	5
	6 Without energy	6 Sans énergie