Transportation Research Part F: Psychology and Behaviour 94 (2023) 99–113

Contents lists available at ScienceDirect

Transportation Research Part F: Psychology and Behaviour

journal homepage: www.elsevier.com/locate/trf

Evolutions in undirected travel (satisfaction) during the COVID-19 pandemic

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ARTICLE INFO

Keywords:
Undirected travel
Travel satisfaction
COVID-19 travel behavior
Positive utility of travel
Pandemic mobility
Mobility equity

ABSTRACT

The COVID-19 pandemic illustrated that undirected travel (UT), or trips taken for their own sake, can partly compensate for a reduction in destination-based trips due to governmental regulations. Consequently, UT (in general, but particularly during the pandemic) may be especially satisfying and therefore important to subjective well-being. However, through the course of the pandemic, changes in UT were anticipated as individuals adapted to a 'new normal'. This research – conducted in Flanders, Belgium – first investigates whether the characteristics of and satisfaction with UT persisted after one year into the pandemic (April 2020 to May 2021) using longitudinal panel data from two waves (n = 332). Results of paired sample t-tests indicate that UT satisfaction increased though duration of trips decreased, and results of the Sign test indicate that the frequency of UT generally decreased. Second, this research investigates characteristics of individuals with different UT behavior. Six profiles of UT behavior were identified based on starting or stopping UT, increasing or decreasing UT, maintaining UT frequency, or not participating in UT. Chi^2 tests identified differences among profiles based on wave 1 UT frequency, most recent trip mode, socio-demographic, and household characteristics. Results indicate that participation in UT might motivate future UT, one to three UT trips per week is a maintainable frequency, UT might be important to those with smaller living spaces and those living with children or other adults, and suggest that attention should be paid to mobility equity, including how and for whom systems are planned. These findings are important to understanding the effects of long-term governmental regulations in response to the COVID-19 pandemic on travel behavior, and how investigating UT might help to challenge and reimagine traditional mobility systems post-pandemic.

1. Introduction

The evolution of travel behavior through the COVID-19 pandemic was drastic, with five major themes: 1. Reduction in mobility, 2. Spatial-temporal adjustment, 3. Modal adjustment, 4. New out-of-home activities, and 5. Digital adaptation (for review, see Van Acker, 2022). Full-time teleworking increased approximately 30–35 %, the primary trip purpose became shopping, trips became shorter in distance with a generally smaller activity space, and trips became less frequent (Abdullah et al. 2020; Abdullah et al., 2021; De Haas

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https://doi.org/10.1016/j.trf.2023.01.025
Received 8 June 2022; Received in revised form 31 January 2023; Accepted 31 January 2023
Available online 10 February 2023

et al., 2020; Mollow et al., 2020; Shamshiripour et al., 2020). Modal choice shifted away from shared mobility toward non-motorized modes for shorter distances (i.e. < 5 km), and to private cars for longer distances (Abdullah et al., 2021; Shamshiripour et al., 2020). While some of these changes had positive implications for moving toward a sustainable future, there are a number of negative implications for transportation equity regarding for whom travel behavior changed and for whom mobility during free time was potentially beneficial. These inequities may have been exacerbated by the pandemic situation, but are likely to have existed prior to this time and are likely to continue to exist.

The COVID-19 pandemic and related governmental regulations caused a general reduction in daily destination-based travel, meanwhile undirected travel (UT), or travel for its own sake wherein the destination is ancillary to the travel, increased (de Haas et al., 2020; Hook et al., 2023; Mollow et al., 2020). Especially in this setting, it is likely that UT was particularly important because participating in walks, bike rides, or joy rides, for instance, provided a chance to get out of the house, to be physically active, or to meet friends and family when it was unsafe or prohibited to enter the homes of others. In addition to being linked to health and sustainability because they are often active, UT trips are (generally) more satisfying than destination-based trips (Hook et al., 2023), indicating that perhaps UT was used as a mechanism to improve well-being for those who were struggling with negative psychological or physical effects of the pandemic lockdowns. While studies from the beginning of the pandemic indicate initial UT behavior, the evolution of UT behavior during the course of the pandemic, and its potential benefits, is unclear. Therefore, this study aims to inform this gap using longitudinal panel data from Flanders, Belgium.

As suggested by the Law of Diminishing Returns (e.g. Real, 1980), it is possible that the initial benefits gained from participating in UT in the early phases of the pandemic diminished as it continued and UT trips were repeated over time into the later phases of the pandemic. Subsequently, a reduction in satisfaction with UT could be hypothesized, with implications for a simultaneous reduction in overall well-being. On the other hand, as UT may have been an opportunity at the beginning of the pandemic to exercise or reduce stress, for instance, this behavior may also have persisted, becoming a habit that lasted into the later phase of the pandemic (and potentially post-pandemic) alongside the physical and mental benefits. Further, though the COVID-19 situation no longer seems volatile at the time of writing, it is important to understand the implications of pandemic situations for UT behavior in the event of future crises, as well as further understand satisfaction with UT, its implications for well-being, and for whom UT is a beneficial activity.

This paper will approach UT research with an exploratory and descriptive analysis, which is valuable for two main reasons. First, investigating the trends of UT one year into the COVID-19 pandemic can inform the extent to which it was used as a strategy to compensate for a reduction in out-of-home activities, to improve physical and mental health and well-being, and to socialize outside of the home and provide baseline information to compare with UT outside of the pandemic situation. Due to the positive relationship between travel satisfaction and subjective well-being, if UT satisfaction increases, improved overall well-being might follow. Second, though gaining recent attention in travel behavior literature, empirical investigation of UT remains uncommon and is worthwhile to explore due to its links to health, well-being, and sustainable mobility. As the share of UT to total travel is perhaps larger than is recognized by travel behavior literature (Mokhtarian and Salomon, 2001), deeper investigation can assist in reimagining outdated mobility norms as, for instance, travel schedules may become more flexible with teleworking, ecologically sustainable travel strategies are improved, or technology-driven transportation develops.

This paper uses two waves of longitudinal panel data to investigate general trends in UT between the beginning of the pandemic (20 April – 4 May 2020) and one year into the pandemic (23 April – 6 May 2021), as well as identify for whom UT behavior changed among 322 residents of Flanders, Belgium. A literature review will first discuss UT and travel satisfaction, the positive utility of travel, travel behavior changes during the COVID-19 pandemic, and the situation in Flanders during the two periods of survey collection. Following, changes in trip characteristics and UT satisfaction between the two survey waves are explored using the Sign test, McNemar-Bowker test, and paired sample t-tests. Finally, six UT behavior changes profiles are identified – started UT, stopped UT, increased UT, decreased UT, maintained UT frequency, and no UT. These profiles are evaluated in terms of general wave 1 UT frequency, wave 1 most recent UT mode, socio-demographic characteristics, and household characteristics through Chi^2 tests. In doing so, this research will contribute information about the individuals undertaking UT trips, characteristics of UT trips, travel satisfaction, and potential unanticipated effects of the COVID-19 pandemic on travel behavior.

2. Literature review

2.1. Undirected travel

UT is a form of daily mobility wherein the *trip itself* is the purpose of the travel, and might indicate an inherent demand or fundamental need for mobility (Mokhtarian and Salomon, 2001; Mokhtarian et al., 2001). These trips characteristically have no destination, or the destination is secondary to the travel, and they are most often undertaken with active modes, such as taking a walk, bicycle ride, or jog, though certainly can also be taken with motorized modes, such as a joy ride (Hook et al., 2022; Mokhtarian and Salomon, 2001), and physical activity is neither a requirement nor a sufficient condition of UT trips. Directed travel, in contrast, includes, for instance, commuting, shopping, or leisure trips, and have the primary goal of reaching a destination. UT might account for a larger share of total travel than the travel behavior field recognizes (until recently, UT trips have often fallen into the category of leisure travel), challenging the idea that travel is something to be minimized for which less is always better (Hook et al., 2023; Mokhtarian and Salomon, 2001).

Though empirical analysis specifically regarding UT is sparse, research has thus found that in addition to strong motivations to undertake UT with active modes, those who participate in UT are motivated to use more than one mode and travel for longer durations

than they are for directed trips (Hook et al., 2021a, 2022). UT trips are taken less often than other types of [directed] trips, but have been found to be the most important to physical activity and to be associated with the positive utility of travel (Hook et al., 2023). UT participation and demand has also been found to be influenced by positive travel attitudes and built environments that encourage travel (Cao et al., 2009; Mokhtarian et al., 2001).

The COVID-19 pandemic provided a unique opportunity to study UT in much more detail than before alongside changes in availability of out-of-home destinations, flexibility of remote working, and caution toward public spaces (among many other factors). Travel behaviors adopted during the pandemic are expected to remain, at least to some extent, even after governmental regulations subside and societies fall into a 'new normal' (van Wee and Witlox, 2021), though some research argues that lasting reductions on travel volumes are unlikely (Eliasson, 2022). While this literature review aims to be extensive, it is simply not possible to include all recent research regarding travel behavior during the COVID-19 pandemic as new work is constantly being published. Research regarding UT shows that as individuals began teleworking, some of the reduction in commuting trips was compensated with undirected trips (Hook et al., 2021b). De Haas et al. (2020) found that 'roundtrips' (i.e. UT trips) accounted for 25 % of total trips during the pandemic and gained in popularity with 20 % of individuals planning to walk or cycle more in the future. Mollow et al. (2020) found a large increase in weekend bicycle use and cite that it is for 'clear sporting, fitness, leisure motivation' (i.e. UT trips). Further investigation of UT both in a pandemic and a general context is important as mobility norms shift and the true share of UT to total travel is recognized, particularly as it is considered to be generally healthy and sustainable mobility.

2.2. Positive utility and UT

The positive utility of travel is defined as benefits derived from the act of traveling, due to either experiences or activity-participation during travel (De Vos et al., 2016; Singleton, 2017) or the travel itself (Mokhtarian and Salomon, 2001). For example, the extra time is often worthwhile for those interested in completing assignments, enjoying hobbies, pet walking, or being physically active while they travel (Cook, 2021; Jain and Lyons, 2008). A number of scholars have documented the preference for a non-zero commute time as it offers an opportunity to, for example, break up activities or prepare for the task ahead (Humagain and Singleton, 2020; Redmond and Mokhtarian, 2001; Ye et al., 2020). In fact, the value ascribed to travel time has been found to increase with activity-participation (Le et al., 2020). Mode distinctions, such as car use, can further have an effect on attitudes, emotions, and self-presentation (Jakobsson, 2007; Steg, 2005).

UT has been found, alongside leisure trips, to be more associated with the positive utility of travel than commuting or shopping trips (Hook et al., 2023). UT provides specific utility by offering opportunities to improve physical and mental health and well-being, remove negative feelings, enjoy scenery, or socialize outside of the home (Hook et al., 2022; Mokhtarian and Salomon, 2001). Additionally, UT might be important to accomplishing goals or self-care (Redmond and Mokhtarian, 2001; Ye et al., 2020). Though empirical investigation of UT and its relationship to the positive utility of travel is rare, the nature of UT trips (for the purpose of the trip itself) indicates a straightforward and obvious connection to utility. The COVID-19 pandemic made clear the importance of UT trips to the positive utility of travel by demonstrating that individuals might have used this form of mobility as a tool to compensate for health or social benefits lacking as a result of the pandemic setting.

2.3. Travel satisfaction, well-being, and implications for equity

The perception of positive utility of travel can have a direct positive effect on mood, experiences during travel, and attitudes toward travel, which can therefore improve satisfaction with travel, and, in turn, well-being (Ettema et al., 2010; Friman et al., 2017). Travel satisfaction is often considered a domain of subjective well-being (Ettema et al., 2011; Ye and Titheridge, 2017), but this relationship is recognized as bi-directional. In other words, it is possible that both those who have more satisfying travel experiences become happier, and people who are generally happy with life perceive their travel experiences as more satisfying. Emotions during and evaluations of travel can be influenced by, for instance, positive or negative feelings during travel, activity-participation during travel and/or at the destination, travel as the activity (UT), or motility (Bergstad et al., 2011; De Vos et al., 2013; Ye and Titheridge, 2017).

The Satisfaction with Travel Scale (STS) measures travel related well-being through emotion and evaluation components (Ettema et al., 2011). UT satisfaction has been found to have a clear positive relationship to well-being (Hook et al., 2021a). Levels of UT satisfaction have been found to be higher than satisfaction with commuting and shopping trips, but not quite as high as satisfaction with leisure trips (Hook et al., 2023). Other studies have found that trips taken with active modes, for shorter durations (for directed travel, though not for UT), and with company are more satisfying (De Vos et al., 2016; Higgins et al., 2018; Mokhtarian et al., 2015; Morris and Guerra, 2015; St-Louis et al., 2014; Ye and Titheridge, 2017). Satisfaction with trip distance has been found to be more related to the activity at the destination than the trip itself, with distance having a positive relationship to leisure trips (De Vos et al., 2016; De Vos, 2018; De Vos, 2019). Public transport users and suburban residents have been found to have lower travel satisfaction (De Vos et al., 2016; De Vos, 2018). Travel satisfaction is further linked to satisfaction with life domains, and therefore could affect overall well-being (Bowling et al., 2011; Clark et al., 2020; Diener, 2009; Howell and Howell, 2008; Kuykendall et al., 2015; Wiese et al., 2017). For instance, commuting satisfaction might influence satisfaction with employment or free time, which might in turn influence overall happiness. Due to the high levels of satisfaction found with UT, it is probable that it can be used as a strategy to improve well-being both during normal times and during times with elevated external stress (i.e. during the COVID-19 pandemic).

The COVID-19 pandemic further accentuated equity issues related to both travel behavior and well-being. Though large declines in travel and public transit use were seen, these declines were considerably less among lower-income and less-educated individuals and this gap remained as lockdown policies became less restrictive (Brough et al., 2021). Men traveled more than women, younger people

participated in more teleshopping, and higher-income people participated in more teleshopping and teleworking (Irawan et al., 2021). Similarly, men, those above 30, car owners, and higher-income individuals took significantly more non-commuting trips than their counterparts (Abdullah et al., 2021). De Haas et al. (2020) found that though activity generally reduced, older people's mobility was particularly reduced. While the long-term consequences of the pandemic on mobility are still largely unknown, it is possible that, though traffic volumes may return (Eliasson, 2022), discrepancies in transportation equity have been exacerbated.

Additional equity and well-being impacts of the pandemic are important to note as they could have indirectly affected travel behavior. For example, Shamshiripour et al. (2020) found that lower-income households (under 30,000USD per year) were four times as likely to become unemployed due to the pandemic than high-income households (150,000USD per year or above). This could have implications not only on the commuting behavior of these individuals, but also on their UT behavior if perhaps a reduction in commuting is compensated with UT. Fortier (2020) notes that as women were disproportionately negatively affected by the COVID-19 pandemic in terms of socio-economic hardships, their jobs tended to be given a lower priority than men's and they tended to assume more of the increased caregiving needs. This observation has numerous implications for travel behavior, and specifically for this research as increased caregiving could indicate a reduction in free time, which is commonly when UT trips take place. On the other hand, UT itself could have been a caretaking activity in some cases.

In this study, changes in trip characteristics and satisfaction with UT will be analyzed during the COVID-19 pandemic in Flanders, Belgium. The pandemic setting and subsequent adjustments in travel behavior offered a specific opportunity to explore UT characteristics and satisfaction over time, as well as determine which individuals might be more likely to participate in UT. In addition to being generally healthy and sustainable (i.e. active), UT might improve well-being for those who were struggling with negative effects of the pandemic lockdowns, and these benefits might have persisted alongside the pandemic or diminished as UT became a less novel or exciting activity. This research is approached from an exploratory and descriptive perspective, aiming to gain more insight about UT trips and their role during the pandemic. Deeper investigation can assist in reimagining mobility norms as travel behavior adapts in response to, for instance, a global pandemic, climate change, or technological advancement.

3. Data and methods

3.1. Case study

The Oxford University Stringency Index (Hale et al., 2021a, b) offers a severity calculation valued between 0 and 100 for over 180 countries on each day of the pandemic using indicators categorized [for Belgium] by containment and closure, economic response, and health systems through their Oxford COVID-19 Government Response Tracker (OxCGRT). The OxCGRT was used to provide further information over differences in the governmental lockdown regulations during the two waves of data collection (Table 1), as large differences could certainly have affected UT behavior of respondents. In addition to containment and closure measurements, the OxCGRT details economic response and health systems, though the latter were excluded as they are less relevant to individuals' daily activities and mobility. While relatively strong measures were seen in Belgium during both time periods, data wave 1 responses were collected during harsher governmental regulations (stringency level = 81.48) than data wave 2 responses (stringency level = 60.19). These differences included the severity of school and workplace closures, event and gathering restrictions, and movements within and outside of Belgium. Differences in governmental regulations in Belgium between the two waves of data collection could have implications for UT behavior and general mobility habits.

3.2. Sample recruitment

Two surveys (distributed to respondents in Dutch and translated to English for reporting this paper) provided information over UT characteristics and satisfaction during the COVID-19 pandemic lockdown among residents of Flanders, Belgium. The initial survey (20 April – 4 May 2020) targeted social media groups hosted by residents of 41 municipalities in the Ghent and Antwerp regions (17 and 24 groups, respectively) through convenience sampling by (manually) posting advertisements in the municipality-based Facebook group

Table 1
OxCGRT indicators for two waves of data collection in Belgium.

	Indicator	Data Wave 1 (20 Apr-4 May 2020)	Data Wave 2 (23 Apr-6 May 2021)
Containment and Closure	**Stringency Level**	81.48	60.19
	School closing	Require closing (some levels)	Recommend closing
	Workplace closing	Require closing all but essential	Require closing some sectors
	Cancel public events	Required	Required
	Restrictions on gatherings	Restrictions on gatherings of 10 or fewer people	Restrictions on gatherings of 10 or fewer people
	Close public transport	No Measures	No Measures
	Stay at home requirements	Required with exceptions	Required with exceptions
	Restrictions on internal movement	Required	No Measures
	International travel controls	Border closure	Ban

Note: Underlined and shaded rows highlight indicators with differences between waves 1 and 2 of data collection.

pages offering a raffle of five €100 vouchers for participation. Given the initial ambiguity of the pandemic, the duration of lockdown could not be anticipated and this sampling method was the quickest way to generate as many responses as possible in a short amount of time given that the Facebook groups had a collective (approximately) 393,000 members. The first survey received 1,041 responses and focused on the utility of UT and its use as a strategy to compensate for travel and activities changed or stopped due to governmental regulations. ([citation removed to protect author identity]) provide more in-depth information on these initial findings.

The second survey included further information after contacting the initial survey respondents, 687 of whom provided information to be contacted for follow-up, and 332 (31.9 % of the full sample) of whom subsequently completed the second survey. This survey was active almost exactly-one year later (23 April – 6 May 2021), and requested information about characteristics of and satisfaction with different trip types (commuting, shopping, leisure, and undirected). For more on this, see ([citation removed to protect author identity]). The survey recruitment message did not specifically emphasize UT behavior, but rather targeted general travel behavior, thus survivorship biases that could cause those respondents no longer taking UT trips (or those taking them less frequently, or those less satisfied with them) to drop out were avoided. Therefore, this research uses the responses of 332 residents in regards to their UT characteristics and satisfaction to investigate behavior changes over the course of one year, starting from the beginning of the Belgian COVID-19 lockdown. While the themes discussed in this paper are similar to themes discussed in papers already published using the first round of data collection, this research builds on those initial findings. Through the use of longitudinal panel data, the element of time is incorporated allowing for investigation into if and how UT characteristics and satisfaction might change and if the initial benefits of UT persist over time.

3.3. Key variables

3.3.1. UT trip characteristics

Respondents provided information about their general frequency of UT trips at the two survey periods during lockdown ('How often do you perform undirected trips?'; never, once, less than once per week, 1–3 times per week, 4–7 times per week, several times per day). Due to a low response rate of 'several times per day', it was added to the closest category to form a '4 + times per week' category. Respondents also were asked to consider their most recent UT trip[1] and provided information at the two survey periods in terms of mode, duration (open-ended minutes, ranging from 0 to 530), and distance (open-ended kilometers, ranging from 0 to 300). Undirected trips were defined as movement without a specific destination or wherein the destination was not the purpose of the trip, such as going on a walk or bicycle ride. Mode options included walking, (electric) bicycle, car, bus/tram, train, jogging, moped/motorcycle, taxi, (electric) scooter, skateboard, roller/inline skates, and other, but as very few respondents indicated use of most modes, they were categorized for this analysis into three groups for reference purposes: on foot (walking and jogging), micromobility (cycling, scooter, skating), and motorized (car and public transport). The changes in frequency are evaluated using the Sign Test because the data is ordinal and non-symmetrical, and changes in mode are evaluated using the McNemar-Bowker test. Both tests allow for the analysis of these multi-valued variables, capturing the overall distribution of changes between the two survey waves. The changes in distance and duration are evaluated using paired sample t-tests. The frequency variable is also used to create UT behavior change profiles.

3.3.2. Satisfaction with travel scale

The Satisfaction with Travel Scale (STS; Ettema et al., 2011) quantified the emotional and evaluation satisfaction components of their most recent UT trip for data waves 1 and 2. Emotion components (positive deactivation – negative activation and positive activation – negative deactivation) included answers to 7-point Likert scale questions asking how bored/enthusiastic, fed up/engaged, tired/alert, stressed/calm, worried/confident, and hurried/relaxed respondents were during their most recent UT trip. Evaluation components included answers to 7-point Likert scale questions asking whether the trip was the worst/best they could think of, whether the trip was low/high standard, and if the trip worked out/did not work out well. Scores for the emotion and evaluation components were averaged in order to produce measures that are comparable across both components. Though some individuals participated in UT in wave 1 but not in wave 2 and vice versa (as discussed in section 4.2), there were 222 respondents participating in UT in both waves. As it is not possible to measure satisfaction for a non-existent trip, only these 222 responses regarding emotional and evaluation satisfaction are assessed using paired sample t-tests.

3.4. Socio-demographics and household characteristics

Socio-demographic characteristics include gender, age, employment status, income, and education. Responses were overwhelmingly female (74.2 %) compared to the population averages of the Ghent and Antwerp regions (50.2 % and 50.4 % female, respectively; StatBel, 2020). The ages of respondents were well-represented according to the Flemish region ($\leq$25: 15.8 %; 26–40: 27.1 %; 41–55: 28.9 %; >55: 28.2 %; StatBel, 2020), as was the employment rate (74.7 %; StatBel, 2020). Average monthly household income was similar to that of Flanders (€1677 average per person; StatBel, 2020). Education level was also higher than average (41 %

[1] It is important to note the potential biases associated with sampling the most recent UT trip, as this will also tend to be the most frequent UT trip. The influence of this bias is unclear, but should be considered as the most recent/frequent trips might be longer, shorter, or more often taken with a particular mode. For example, if the most recent/frequent trips tend to be shorter, then the sample average would underestimate the average of *all* UT trips.

of individuals have completed higher education in Flanders; Statistics Flanders, 2020). In statistical analyses, cases were weighted to achieve overall representativeness with respect to gender as the discrepancy here is quite large, therefore this is something to keep in mind while interpreting results. This information in more detail can be found in the Results section (Table 3).

Household characteristics include car access (private or shared), bicycle access (private or shared), having a balcony or terrace, having a garden, household composition, and living space of household. Car and bicycle access survey questions included options for binary responses, and access was overwhelmingly high with 91.3 % having access to a bicycle and 89.8 % having access to a car. Balcony or terrace and garden access response options were also binary, with most respondents having a balcony or terrace (77.7 %) and/or a garden (75.3 %). Household composition response options included living alone (17.2 %), alone with children (8.7 %), with partner (32.8 %), with partner and children (31.6 %), or other (e.g. with housemates; 9.6 %). These categories were combined into three options for analysis: living alone, living with children (and possibly other adults), and living only with other adults. Square meters of living space response options were categorical: <50 m^2 (1.8 %), 50–99 m^2 (23.8 %), 100–149 m^2 (36.5 %), 150–199 m^2 (27.7 %), and 200 + m^2 (10.1 %). These categories were combined into three options for analysis: <100 m^2, 100–149 m^2, and 150 + m^2. An in depth discussion of the socio-demographic and household characteristics of the six UT behavior change categories can be found in the Results section where they are evaluated using Chi^2 tests.

3.5. Survivorship bias

Survivorship bias refers to a form of selection bias that may occur from overlooking groups that did not make it past the selection process. In this case, this refers to the respondents from data wave 1 that did not participate in data wave 2. It is important to identify differences between these respondents and the respondents that participated in both waves because there may be self-selection by those who are, for instance, particularly enthusiastic about UT trips. ANOVA mean comparison tests and Chi^2 tests (binary variables) were performed for all key variables, sociodemographic, and household characteristics and can be found in Appendix A. ANOVA mean comparison tests were also performed regarding attitudes toward walking, cycling, public transport, and cars, though these variables were not included in the overall analysis, in case survivorship biases could be found here.

Very few significant differences can be seen between those who participated in the second survey wave and those who did not. Those who participated were more likely to be university educated. It is possible that those with university degrees might work more frequently on computers (or have more access to computers) and therefore might have been more inclined to fill out the second survey. This could also account for the increased education level compared to the Flemish population discussed in the previous section. Improving mental well-being through UT trips was less important to those participating in the second survey wave, perhaps indicating that they were less negatively affected by the pandemic itself and therefore more inclined to discuss their experiences during it. Those who participated in the second survey wave had more positive attitudes toward public transport, perhaps indicating that they have more positive attitudes toward travel in general and might be more inclined to fill out the second survey. These biases may not directly affect the results of this research, but they are nonetheless important to bear in mind when interpreting results.

4. Results

4.1. Changes between data waves in UT characteristics and satisfaction

In order to visualize the change in mode between data waves 1 and 2, a Sankey diagram is provided (Fig. 1). Modal shift includes counts of most recent UT trip[2] for those who took their most recent UT trip on foot (walking or jogging), with micromobility (cycling, scooter, or skating), with a motorized mode (car or public transport), or who did not participate it UT. Counts of those taking their most recent UT trip on foot or with micromobility reduced from data wave 1 (197; 83) to data wave 2 (176; 42). Counts of those taking their most recent UT trip with a motorized mode or not participating in UT increased from data wave 1 (6; 46) to data wave 2 (30; 84).

Differences between waves 1 and 2 of data collection can be seen in Table 2 through the Sign Test for ordinal frequency variables, McNemar-Bowker test for categorical mode variables, and paired sample t-tests for other most recent UT trip characteristics and satisfaction. General frequency of UT trips decreased from wave 1 to wave 2 ($p < 0.001$), as denoted by the negative Z-value, with the count of participants taking 4 + UT trips per week decreasing (180 in wave 1 and 38 in wave 2) and the count of all other categories increasing. Changes among modes (or lack thereof) were significant between data waves 1 and 2 ($Chi^2 = 39.923$; $p < 0.001$). The count of participants taking their most recent UT trip on foot decreased, the count of participants using micromobility for their most recent UT trip decreased, and the count of participants using motorized modes for their most recent UT trip increased.[3] Post-hoc tests with a Bonferroni correction revealed significant differences between changes in micromobility and motorized modes ($p = 0.008$) and between changes in micromobility and no mode ($p = 0.004$).

[2] There will be some degree of random variation here due to sampling the most recent UT trip as a participant may have the same overall distribution of trips between the two waves, but the mode of the most recent trip may have differed between waves 1 and 2. Certainly, however, the most frequent trip type is more likely to also be the most recent trip type.

[3] It should be mentioned here that though approximately 4% of total UT trips in Wave 1 were taken with motorized modes, there was no example of motorized UT provided to survey respondents. If a joy-riding example had been provided, it is possible that more survey respondents may have considered these trips and then offered information about them. Though this was rectified in the examples provided for the Wave 2 survey, it is possible that this could account for some of the most recent UT shift toward motorized modes.

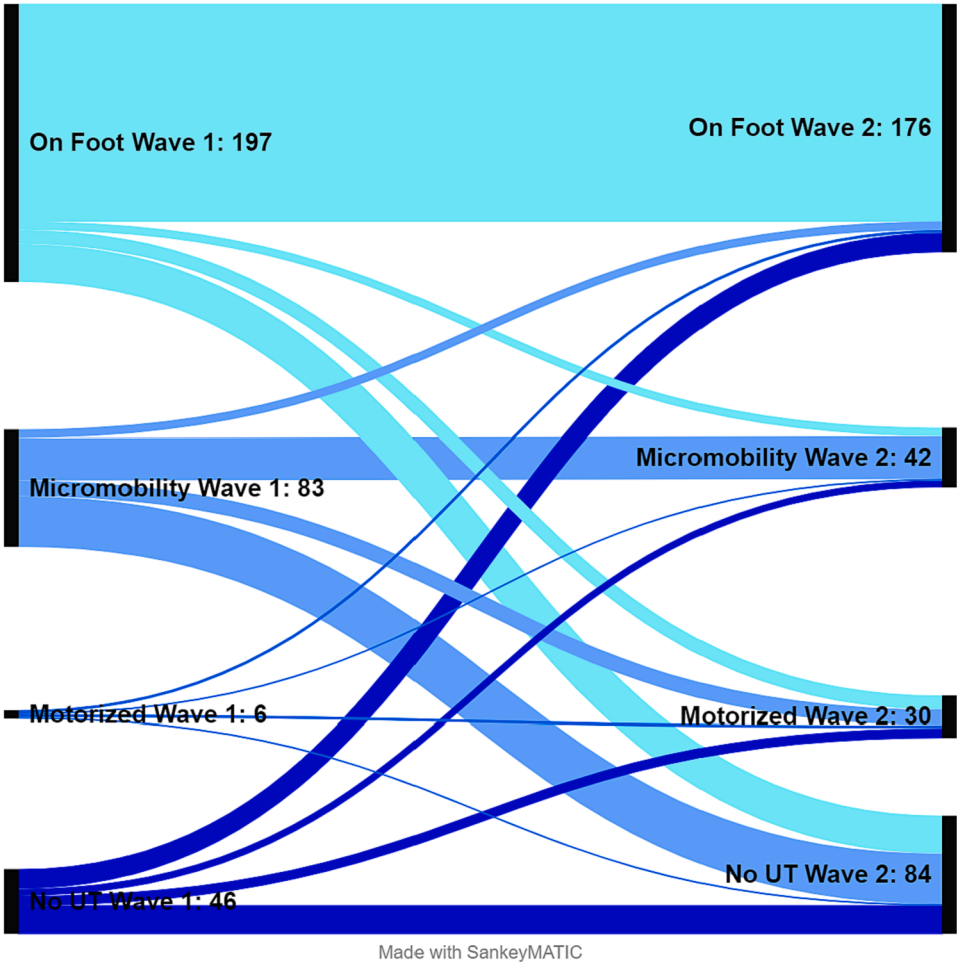

Fig. 1. Sankey Diagram depicting modal (on foot, micromobility, motorized, or no UT) shift for most recent UT trip from data wave 1 to wave 2 (generated from sankeymatic.com).

Paired sample t-tests (Table 2) further evaluate changes in distance of, duration of, and satisfaction with the most recent UT trip. Positive mean values indicate an increase from data wave 1 to wave 2. Mean duration of most recent UT trips significantly decreased (59.14 min to 48.88) and mean distance slightly increased (8.50 km to 8.95), which could either simply reflect modal shift toward motorized modes or indicate that though individuals may have continued to participate in UT trips, they spent less time on them. The average of both measures of travel satisfaction increased for those taking UT trips in both waves: emotion (5.37 to 5.79) and evaluation (5.46 to 5.74). Both of these increases were significant, indicating that UT trips taken with longevity might become more satisfying which could in turn have positive implications for well-being.

4.2. UT behavior change profiles

In order to visualize the change in UT frequency in general between data waves 1 and 2, a Sankey diagram is provided (Fig. 2). Frequency categories included participation in UT never, once, less than once per week, 1–3 times per week, and 4 or more times per week for both data waves 1 and 2. Observing frequency change allows for categorization of UT behavior change by identifying those who kept the same UT frequency, decreased UT frequency, increased UT frequency, started taking UT trips, stopped taking UT trips, or participated in no UT. There were 134 respondents (40.4 %) who reported a decrease in UT frequency from data waves 1 to 2 and 42 respondents (12.7 %) reporting increasing UT frequency from data wave 1 to 2. There were 26 respondents (8 %) who reported taking UT trips in the second but not the first survey (started UT), 64 respondents (19.3 %) who reported taking UT trips in the first but not the second survey (stopped UT). There were 46 respondents (13.9 %) who reported no change in UT frequency and 20 respondents (6 %) that reported never taking UT trips in both surveys.

4.2.1. Frequency and mode differences of UT behavior change profiles

This section discusses the wave 1 frequency and most recent trip mode (Table 3) of four UT behavior profiles: stop UT, increase UT,

Table 2
Comparison of data waves 1 and 2 for general UT frequency, most recent UT trip characteristics, and most recent UT trip satisfaction variables through the Sign Test (for ordinal variables; with Z-value and significance statistic), the McNemar-Bowker test (for categorical variables; with Chi^2 and significance statistic) and paired sample t-tests (including mean, standard deviation, 95% confidence intervals, and significance statistic).

			Data Wave 1 (n = 332)		**Data Wave 2** (n = 332)						
General UT Frequency	4+/week		180		38		**Sign test**				
	1–3/week		54		110		Z				*p*
	<1/week		42		54		***−8.062***				***<0.001***
	Once		10		46						
	Never		46		84						
Most Recent UT Trip Characteristics	On foot		197		176		**McNemar-Bowker test**				
	Micromobility		83		42		Chi2				*p*
	Motorized		6		30		***39.923***				***<0.001***
	No Mode		46		84						
			Data Wave 1		**Data Wave 2**		**Paired Sample t-tests**				
		[Range]	Mean (n = 332)	St. Dev.	Mean (n = 332)	St. Dev.	Mean	Std. Dev.	95 % CI Low.	Up.	*p*
	Duration (min)	[0–530]	59.14	56.14	48.88	55.12	***−10.26***	***72.63***	***2.42***	***18.10***	***0.005***
	Distance (km)	[0–300]	8.50 (n = 222)	11.82	8.95 (n = 222)	21.97	0.45	22.33	−2.86	1.96	0.357
Satisfaction with Most Recent UT Trip	Emotion	[1–7]	5.37	1.21	5.79	1.00	***0.42***	***1.37***	***0.24***	***0.60***	***<0.001***
	Evaluation	[1–7]	5.46	1.14	5.74	1.06	***0.28***	***1.41***	***0.09***	***0.47***	***0.002***

Note: bold and italic values significant at $p < 0.05$ level.

decrease UT, and same frequency UT. Those starting UT or not participating in UT were not considered for this section as they did not answer questions about wave 1 UT. Frequency of wave 1 UT trips may suggest a respondent's travel behavior profile because those who participate in some UT may continue or increase this behavior, or there may be a threshold of the optimal frequency of UT trips. There were more respondents taking four or more UT trips per week in wave 1 who stopped or decreased UT trip, and fewer who maintained the frequency of their UT trips. This could indicate that four or more UT trips per week is not a sustainable frequency, and this could reflect the greater availability of free time (or at least the lack of other opportunities for activity during free time) during the height of the COVID pandemic.[4] There were more respondents taking one to three UT trips per week in wave 1 who maintained the frequency of their UT trips than increased, decreased, or stopped UT. This could indicate that one to three UT trips per week is a more sustainable frequency, even as restrictions were lifted and more opportunities for activity were available. On the other hand, those participating in less than one UT trip per week in wave 1 were more likely to increase UT than decrease, maintain frequency, or stop UT. This could indicate that participation in some UT is habit-building and motivates more UT. Similarly, those participating in only one UT trip were more likely to increase or maintain their UT frequency. This could again indicate that a small amount of UT might encourage future UT, although it also might be demotivational for those who maintained this frequency.

The implications of most recent trip mode on the four UT profiles may indicate which modes are sustainable and important to future UT behavior. Those who participated in UT on foot for their most recent UT wave 1 trip were more likely to increase or maintain their UT frequency than decrease or stop taking UT trips. This could indicate that walking or jogging UT encourages future UT and these modes might contribute to building a UT habit. On the other hand, those who used micromobility for their most recent UT wave 1 trip were more likely to stop UT than to increase, maintain, or decrease frequency of UT. They were also more likely to decrease than increase their UT frequency. This could indicate that cycling, scootering, or skating for UT is not necessarily sustainable and might discourage future UT trips. Finally, those using motorized modes for UT were more likely to decrease or stop UT. This could also indicate that joy-riding by car or public transport does not encourage future UT trips. These findings could further indicate that UT on foot may have been a normal behavior even before the pandemic, therefore individuals maintaining these trips were simply continuing to do so as part of their normal routine. Meanwhile, UT trips using micromobility and motorized modes were perhaps performed at the beginning of the pandemic as a short-lived hobby, and therefore were less like to be continued through the course of the pandemic.

4.2.2. Socio-demographic and household characteristics of UT behavior change profiles

This section discusses the socio-demographic and household characteristics (Table 3) of the six UT behavior profiles: no UT, start UT, stop UT, increase UT, decrease UT, and same frequency UT. Understanding the personal circumstances that might be related to UT can provide information about the motivations to participate in these types of trips. Though (as mentioned) women already accounted for a large percentage of respondents, a greater percentage of women started UT (80.8 %), participated in no UT (85.0 %), and maintained their UT frequency (75.0 %) than the full sample. This could indicate gender differences in free time during the pandemic,

[4] This decrease in UT behavior could also indicate the role of regression-to-the-mean (RTM), as there was no possibility for those in the highest frequency group to increase their behavior. A possible consequence of this could be that the documented changes simply reflect natural variance (Barnett et al., 2005).

Table 3
Percentages of wave 1 UT trip frequency, mode of wave 1 most recent UT trip, demographic characteristics, and household characteristics of the full sample, as well as the six UT behavior change categories with Chi^2 tests.

				UT Behavior Profiles					
			Full Sample n = 332	**1. No UT n = 20**	**2. Start UT n = 26**	**3. Stop UT n = 64**	**4. Increase UT n = 42**	**5. Decrease UT n = 134**	**6. Same Frequency UT n = 46**
UT Trip Frequency Wave 1		%4 + per week	54.2	N/A	N/A	81.3 [6]	N/A	85.1 [6]	29.2[3,5]
		%1–3 per week	16.3	N/A	N/A	9.4 [6]	17.5 [6]	10.4 [6]	56.3[3,4,5]
		%<1 per week	12.7	N/A	N/A	9.4 [4]	70.0[3,5,6]	4.5 [4]	4.2 [4]
		%Once	3.0	N/A	N/A	0.0	12.5 [5]	0.0[4,6]	10.4 [5]
Mode of Most Recent UT Trip Wave 1		%On Foot	59.3	N/A	N/A	42.2[4,6]	97.5[3,5]	68.7 [4]	81.3 [3]
		%Micro -mobility	25.0	N/A	N/A	56.3[4,5,6]	2.5[3,5]	27.6[3,4]	18.8 [3]
		%Motorized	1.8	N/A	N/A	1.6 [4]	0.0[3,5,6]	3.7 [4]	0.0 [4]
Socio- demographic	%Female		74.1	85.0	80.8	71.9	70.0	73.1	75.0
	Age	%≤25	11.7	0.0	0.0	10.9	12.5	12.7	20.8
		%26–40	24.1	10.0	15.4	23.4	25.0	25.4	31.3
		%41–55	34.0	25.0	53.8	31.3	35.0	34.3	29.2
		%>55	30.0	65.0[4,5,6]	30.8	34.4	27.5 [1]	27.5 [1]	18.8 [1]
	%Employed/ Studying		65.4	40.0 [4]	53.8 [4]	62.5	80.0[1,2,5]	64.2 [4]	77.1
	%HH Income <€3500/M		55.2	78.6	69.6	65.5	52.8	45.1	56.8
	%Bachelor's Degree +		69.9	45.0	50.0 [4]	68.8	85.0 [2]	70.9	77.1
Household	%Car Access		89.8	90.0	96.2	93.8	82.5	89.6	87.5
	%Bicycle Access		91.3	75.0	80.8 [5]	90.6	95.0	94.0 [2]	93.8
	%Balcony/ Terrace		77.7	80.0	88.5	76.6	65.0	79.1	79.2
	%Garden		75.3	70.0	80.0	85.9 [6]	72.5	75.4	62.5 [3]
	%Live Alone		17.2	30.0	19.2	18.8	22.5	14.9	10.4
	%Live Only Adults		42.5	45.0	30.8	43.8	30.0	44.8	50.0
	%Live Children/Adults		40.4	25.0	50.0	37.5	47.5	40.3	39.6
	%SqM < 100		26.2	40.0	38.5 [3]	17.2 [2]	35.0	20.1	35.4
	%SqM 100–149		37.3	40.0	23.1	43.8	25.0	40.3	37.5
	%SqM 150+		36.4	20.0	38.5	39.1	40.0	39.6	27.1

Note: significance between groups at $p < 0.05$ level is denoted in superscript by group names [1,2,3,4,5,6].

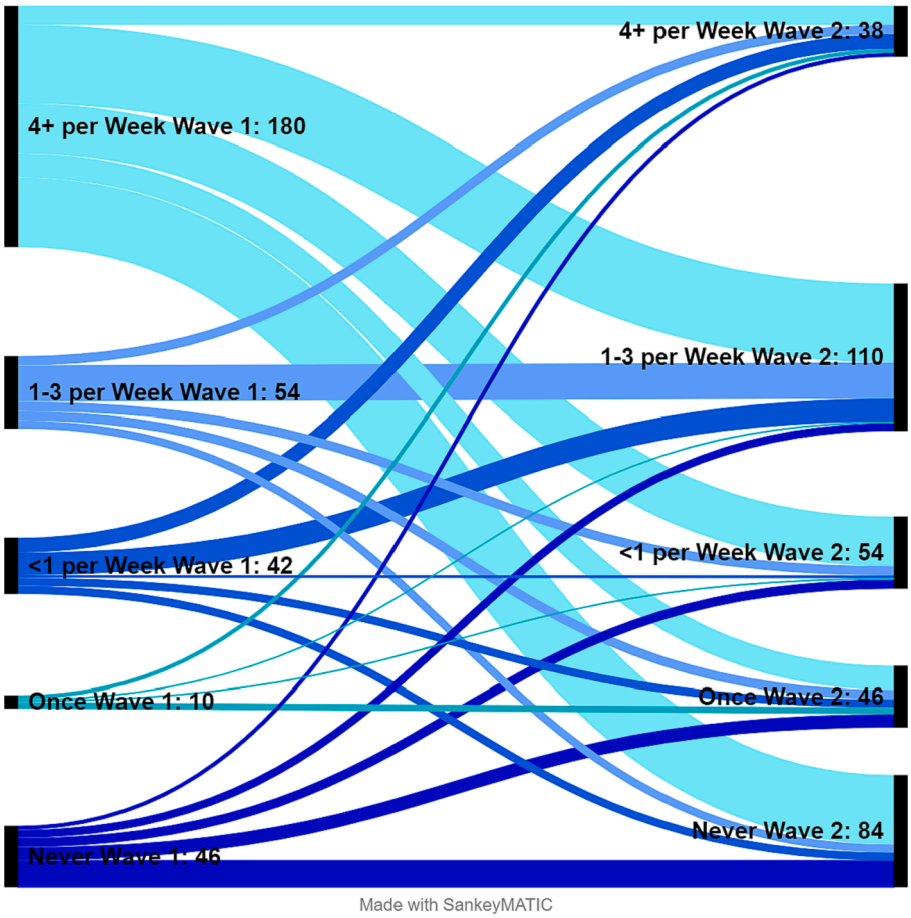

Fig. 2. Sankey Diagram depicting shift in frequency of UT trips from data wave 1 to wave 2 (generated from sankeymatic.com).

or that, as the pandemic persisted, women were increasingly participating in UT.

Regarding age, a smaller percentage of the younger groups (≤25 and 26–40) started UT (0.0 %; 15.4 %) or participated in no UT (0.0 %; 10.0 %), but a larger percentage maintained their UT frequency (20.8; 31.3) than the full sample. This could indicate that UT is a more normal activity for younger people, or that younger people may have been more likely to compensate for a reduction other activities during the pandemic. On the other hand, a greater percentage of the middle-aged group (41–55) started UT (53.8 %) than the full sample. This could indicate that as the pandemic restrictions were removed, this group was more motivated to participate in UT. A greater percentage of the oldest group (>55) participated in no UT (65 %) compared to the full sample. This could indicate limitations in taking UT trips due to reduced mobility as one ages.

Those who were employed or studying were more likely to increase or maintain their UT behavior than the full sample. There were also more likely to increase their UT than participate in no UT, decrease UT, or start UT. It is possible that those who work may be more inclined to participate in UT to decrease stress from their jobs, compensate for a lack of travel when teleworking, or are more capable of getting out of the house to take additional travel trips. A greater percentage of those not participating in UT had monthly household incomes under €3500 (78.6 %) than the full sample, as did those who started UT (69.6 %). This indicates some equity issues regarding income and participation in UT, and that UT may not be an activity that is accessible or inclusive for all. Those who are university educated were more likely to increase their UT (85.0 %) than start UT (50.0 %), though this could echo the selection bias as previously discussed. On the other hand, this could indicate that UT is perhaps an activity undertaken by those who are university-educated with higher income, and therefore more likely to hold sedentary jobs (e.g. office jobs) that do not allow for much daily physical activity and are often teleworkable.

Though travel access generally was quite high, a higher percentage of people who started UT (96.2 %) had access to a car than the full sample. This could indicate that some UT trips may have compensated for a reduction in car use due to the pandemic. A lower percentage of people participating in no UT (75.0 %) had access to a bicycle compared to the full sample, but those with bicycle access were more likely to decrease their UT (94.0 %) than start UT (80.8 %). This could indicate that bicycle access was important to UT at the beginning of the pandemic, but became less important as time progressed. This also mirrors the modal shift that was seen in the earlier analysis between data waves 1 and 2. A greater percentage of those who started UT (88.5 %) had a balcony or terrace, though those with a garden were more likely to stop UT (85.9 %) than maintain their UT frequency (62.5 %). This could indicate that those

with a larger outside area at home did not find UT as important as those without.

Those living alone were less likely to participate in UT (30.0 %), those living with children (and possibly other adults) were more likely to start UT (50.0 %), and those living only with other adults were more likely to maintain their UT frequency (50.0 %) than the full sample. This could indicate that UT might be an important activity to occupy children when other options are not available, that those living alone might participate in other activities than UT, and that those living only with other adults might take more time away from their homes. Those living in smaller living spaces (under 150 m^2) were more likely to start UT (38.5 %) than stop UT (17.2 %) indicating that perhaps there was more of a need to get out of the house for these individuals as the pandemic progressed. A smaller percentage of those in mid-size homes started UT (23.1 %) and a smaller percentage of those in the largest homes did not participate in UT (20.0 %).

5. Discussion and conclusion

This paper uses longitudinal panel survey data to investigate changes in UT characteristics and satisfaction over the first year of the COVID-19 pandemic, as well as identify for whom UT behavior changed among 322 residents of Flanders, Belgium. The exploratory approach includes the Sign test, the McNemar-Bowker test, paired sample t-tests, and Chi^2 tests. The pandemic setting, related governmental lockdowns, and subsequent changes in travel behavior offered a specific opportunity to explore UT as it is a generally healthy and sustainable (i.e. active) form of travel with positive implications for well-being.

Overall, the benefits of UT found in previous research persisted through the pandemic as travel satisfaction increased over time, though the overall frequency of UT trips decreased with 59.6 % of respondents stopping or decreasing their UT trips (compared to 34.3 % who started, increased, or maintained UT trips). Among the most recent UT trips taken by respondents, the share made on foot and with motorized modes increased while the share made with micromobility decreased. Among the most recent UT trips, duration decreased but distance did not change overall, which might be attributed to modal shift of some longer trips toward motorized modes, for instance, or could indicate that some were increasing their speed as they continued UT trips. A rise in UT satisfaction with the most recent UT trip indicates that individuals increasingly enjoy UT, that these trips might continue post-pandemic, and that UT could have a positive impact on well-being for those who continue making such trips. It is worth reiterating here that these findings simply provide an indication of UT behavior during these two time periods, as the sampling of respondents' most recent UT trip cannot provide information about their total number of trips or their potential changes.

Six types of travelers were identified by assessing the change in frequency between the two survey periods: those who started taking UT trips, those who stopped taking UT trips, those who increased UT frequency, those who decreased UT frequency, those who maintained the same UT frequency, and those who did not participate in UT. Four or more UT trips per week was not found to be a sustainable activity level, but instead one to three trips per week was more maintainable over the year time frame. Participation in UT might be the result of habit, and taking UT trips might motivate future UT trips (although those who find it demotivational might stop completely). Particularly, those whose most recent UT trips were on foot were more motivated to maintain their UT trips, while those using micromobility or motorized modes were less motivated to continue UT.

Women were less likely to participate in UT, though many started taking UT trips or maintained their UT frequency, perhaps indicating discrepancies in free time and care duties among genders found in previous literature. UT was most linked to the younger groups ($\leq$25 and 26–40) and least to the older group (>55), potentially indicating a greater need to get out of the house for younger populations as well as limitations in mobility in ageing populations. UT was linked to being employed or studying, having a higher income, and being university educated, potentially indicating the need to destress after work, the need to compensate for sedentary working environments (for instance, in office jobs), or the need to compensate for a lack of total travel when teleworking. It is important to note that many jobs that were not possible to move to teleworking during the pandemic were those of lower-income individuals, therefore the potential need to commute in this population may explain the lack of association to UT trips. These findings are similar to other travel behavior research regarding 'non-commuting' trips during the COVID-19 pandemic.

Though travel access generally was quite high, a link between car access and starting UT was found, perhaps agreeing with previous research that UT trips compensated for a reduction in car use due to the pandemic. Bicycle access seemed to be important at the beginning of the pandemic, but lost importance to UT as time progressed. UT was more important to those with less private outside space and to those living in smaller homes, indicating that UT could be important to getting outside in fresh air or sunlight. UT might be an important activity for those who have children as a caretaking activity, or for those living with other adults who might need to escape their home once in a while, but less important to those living alone.

The main limitations of this paper include the convenience sampling method of the first survey, potential survivorship biases, the elevated higher-educated response rate and associated selection bias, the elevated female response rate which was accounted for with weighted descriptive statistics, and effects of the pandemic lockdowns on UT participation. The method of convenience sampling through municipality-based social media groups invites participants who are (clearly) more likely to participate in social media, and possibly with a higher civic awareness. Though these factors may not be directly related to participation in undirected travel, the sample cannot be considered strictly representative of the population at large, perhaps weakening the generalizability of the findings. Second, it is possible (or even likely) that the frequencies of wave 2 nonrespondents decreased even more than those of wave 2 respondents, therefore the potential biases of viewing only the respondents must be considered. Third, evaluating responses from a higher-educated sample might overestimate the relationship between UT and teleworking, especially as there seems to be some self-selection into the wave 2 survey from a higher-educated population. Finally, the evolution in regulations toward the end of the pandemic should be noted as there was a discrepancy in lockdown stringency between the two time periods. As Belgium was experiencing high COVID-19 infection rates and hospitalizations during the time of the second survey, governmental regulations were

actually at a higher point than other times throughout the pandemic (though not as high as the onset of the pandemic), therefore the stringency was perhaps 'as close as possible' to the first survey period. As more out-of-home destinations were available during the second survey, this could have an effect on UT participation, characteristics and satisfaction.

In sum, satisfaction with the most recent UT trip increased over the first year of the COVID-19 pandemic, indicating that UT remained important even when pandemic restrictions loosened and therefore may still be a useful way to enhance well-being in normal times. Participation in UT might motivate participation in future UT as individuals form habits and continue this behavior. Six profiles of UT behavior were identified, those who took their most recent UT trips on foot were more likely to maintain or increase UT trips, and one to three UT trips per week was found to be a sustainable frequency of UT, though a substantial overall decline in frequency was found. Participating in UT was linked to being male, younger, employed, and in higher income and education categories. Bicycle access was found to be important to UT at the beginning of the pandemic, but less so over the year. UT was found to be more important to those in smaller living spaces with less private outside space. Finally, UT might be an important activity for those with children or living with other adults who might need to escape the house.

Future research should aim to recognize distinctions between directed travel and UT, as the latter is strongly and positively linked to travel utility, satisfaction, and well-being. Furthermore, the share of UT compared to travel with destinations remains unclear and should be analyzed in future studies. However, this research signifies a number of equity issues associated with UT mirroring those found generally in mobility research, requiring consideration of how and for whom mobility systems are planned and implemented. A path forward to analyze if (and which) personal characteristics might effect UT behavior could investigate their impacts at each wave on lagged effects of prior UT mode and frequency. As travel behavior norms change within societies dealing with complex and interconnected environmental and societal problems, UT is generally healthy, sustainable, challenges the idea that travel is a derived demand for which less is always better, and encourages the reimagining of mobility systems.

UT is beneficial to society due to its connections to physical health, mental well-being, environmental exposure, and social cohesion. UT trips are overwhelmingly undertaken with active modes, particularly on foot, and a widespread increase in active travel is often promoted as a response to global challenges such as climate change, the obesity epidemic, social equity, or the COVID-19 pandemic. Further, urban planning policy could improve equity in outdoor green space accessibility by providing good quality pedestrian and cycling spaces (e.g. parks), which may play a critical role in improving the disparities in UT trips seen in this study. Not only is the share of UT to total travel often undervalued, but UT trips might also compensate for a decrease in directed trips. As mobility patterns potentially become more discretionary alongside a general increase in tele-activity (e.g. telework, teleshopping, telehealth, etc.), UT trips will likely become even more important to total travel. Policy should prioritize UT in ways that promote the positive utility of travel and so that participating in UT is accessible to all. For example, building activity parks for additional exercise could improve walking and cycling paths, redirecting traffic could make streets calmer and more relaxing for active travelers, improving green space could cultivate environmental exposure, or anthropocentric infrastructure could encourage social cohesion. Societies that prioritize equitable UT may become healthier, happier, and more environmentally sustainable.

Funding

This work was supported by the Research Foundation – Flanders (FWO) [Grant No G057719N] and the Luxembourg National Research Fund (FNR) [grant number 12676895].

The funding source had no involvement in study design, in collection analysis, and interpretation of data, in writing the report, or in the decision to submit the article for publication.

CRediT authorship contribution statement

Hannah Hook: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization. **Jonas De Vos:** Conceptualization, Methodology, Writing – review & editing, Supervision, Project administration, Funding acquisition. **Veronique Van Acker:** Methodology, Data curation, Writing – review & editing, Supervision, Project administration, Funding acquisition. **Frank Witlox:** Resources, Writing – review & editing, Supervision, Project administration, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Survivorship bias comparisons (Chi^2 and ANOVA mean comparison tests) for trip characteristics, reasons to travel, satisfaction, attitudes toward travel, sociodemographic, and household variables between respondents from wave 1 who participated in wave 2 and those who did not.

			Wave1 Only		Wave 1 and 2		Chi^2 Tests	
			n	%	n	%	Chi^2	*p*
UT Frequency		4+/week	127	17.9	180	54.2		
		1–3/week	222	31.3	54	16.3		
		<1/week	146	20.6	42	12.7		
		Once	74	10.4	10	3.0		
		Never	140	19.8	46	13.9	5.531	0.237
Most Recent UT Trip Characteristics	Mode	On foot	275	38.8	197	68.9		
		Micromobilty	265	37.4	83	29.0		
		Motorized	29	4.1	6	2.1	1.095	0.578
							ANOVA Tests	
		[Range]	**Mean**	**St. Dev.**	**Mean**	**St. Dev.**	**F**	***p***
	Duration (min)	[0–530]	73.25	60.5	66.57	61.2	2.224	0.136
	Distance (km)	[0–300]	14.79	25.6	12.32	17.1	2.182	0.14
Reasons to Travel	Improving Physical Health	[1–4]	2.49	1.0	2.57	1.1	1.037	0.309
	Improving Mental Well-Being	[1–4]	2.59	1.1	2.43	1.1	***4.46***	***0.035***
	Enjoying Scenery	[1–4]	2.47	1.2	2.57	1.2	1.559	0.212
	Out-of-Home Socialization	[1–4]	2.45	1.1	2.43	1.1	0.058	0.810
Satisfaction with Travel Scale	Emotion	[1–7]	5.44	1.2	5.41	1.3	0.105	0.746
	Evaluation	[1–7]	5.52	1.2	5.47	1.2	0.436	0.509
Attitude Toward Travel	Walking	[0–28]	21.50	5.1	21.90	4.6	1.092	0.296
	Cycling	[0–28]	20.00	5.7	20.20	5.8	0.207	0.649
	Public Transport	[0–28]	9.30	5.3	10.70	5.5	***13.935***	***<0.001***
	Car	[0–28]	14.30	5.2	13.80	5.2	2.613	0.106
Sociodemographic	Age	[16–80]	44.55	14.9	46.18	14.7	2.413	0.121
							Chi^2 Tests	
			n	**%**	**n**	**%**	**Chi^2**	***p***
	Female		386	77.5	246	74.1	1.278	0.258
	Employed/Studying		324	65.1	207	62.4	2.783	0.095
	HH Income <€3500/M		372	74.7	243	73.2	0.045	0.832
	Bachelor's Degree +		305	61.3	232	69.9	***6.503***	***0.011***
Household	Car Access		450	90.4	298	89.8	0.081	0.776
	Bicycle Access		443	89.0	303	91.3	1.168	0.280
	Balcony/Terrace		369	74.1	258	77.7	1.409	0.235
	Garden		388	77.9	250	75.3	0.763	0.382
	Live Alone		103	20.7	57	17.2		
	Live Only Adults		194	39.0	141	42.5		
	Live Children/Adults		201	40.4	134	40.4	1.885	0.390
	SqM < 100		120	24.1	87	26.2		
	SqM 100–149		169	33.9	124	37.3		
	SqM 150+		209	42.0	121	36.4	2.540	0.281

Note: 211 respondents that only completed the Wave 1 survey chose 'prefer not to answer' to sociodemographic and household variables, and were removed from those portions of the analysis. These respondents completed questions regarding travel behavior, motivations, and satisfaction. All responses from Wave 2 participants are complete with sociodemographic and household information.

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