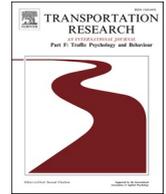




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The impact of travel on perceived activity performance

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ABSTRACT

Many studies in the past two decades have explored travel satisfaction and its determinants. However, how travel satisfaction impacts emotions after trips and the performance of activities upon arrival have only been explored to a limited extent. In this study – using data from online surveys – we analyse travel satisfaction of 2000+ students and staff of University College London travelling to campus, and how this influences the emotions upon arrival and the perceived performance of the first activity after arriving on campus. Additionally, we explore how trip characteristics (e.g., mode, duration, weather) influence the above three elements. Results from one-way ANOVAs and a structural equation model show that there are strong spill-over effects of trip satisfaction on the emotions and activity performance upon arrival. We also found that the used travel mode and trip duration influence trip satisfaction, emotion upon arrival and perceived activity performance. However, their effects on emotions and activity performance are mainly indirect via travel satisfaction. Results indicate that active and short trips will not only improve travel satisfaction, but that they can also positively influence people's mood and the performance of activities. Hence, transport planning concepts stimulating short/active trips have the potential to improve emotional well-being and – through better perceived activities – overall life satisfaction.

1. Introduction

Participating in out-of-home activities is important for people to enhance their quality of life and life satisfaction. Studies have found that out-of-home activities are associated with higher levels of happiness than activities inside the home, and that daily exposure to all kinds of out-of-home activities enhances well-being (e.g., [Ralph, Morris, & Kwon, 2022](#); [Schwanen & Wang, 2014](#); [Spinney, Scott, & Newbold, 2009](#)). Travel not only enables activity participation, but how people travel may also impact how they perform and perceive the activity at the destination. Although many studies have focused on travel behaviour and travel satisfaction, not many have analysed their impact on perceived activity performance.¹

In the past two decades, many studies have analysed how people experience their trips, and how satisfied they are with it. This travel satisfaction refers to emotions² experienced during travel and a cognitive evaluation of trips (e.g., [Ettema et al., 2011](#)). In general, short and active trips are perceived more positively than longer trips with motorised travel modes (e.g., [De Vos, Mokhtarian,](#)

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¹ In this study, perceived activity performance refers to the overall self-reported performance of – and satisfaction with – an out-of-home activity.

² Emotions can be defined as (short-term) positive or negative feelings occurring as a response to a certain situation or behaviour (e.g., [Beedie et al., 2005](#)).

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Schwanen, Van Acker, & Witlox, 2016; Singleton, 2019; St-Louis, Manaugh, van Lierop, & El-Geneidy, 2014; Ye & Titheridge, 2017). Previous studies often consider trip satisfaction as a post-travel (affective and cognitive) evaluation, yet emerging evidence suggests it plays a more dynamic and influential role in shaping the emotional and cognitive states of individuals upon arrival at their destination. According to psychological studies, the experience of (short-term) emotions can impact a person's (longer-lasting) mood (Beedie, Terry, & Lane, 2005). However, not many studies have analysed outcomes of travel satisfaction. How satisfied individuals feel with their travel can influence their emotional state when they arrive, which in turn may affect how they perform their first activity upon arrival. In a review paper, De Vos, Singleton, and Gärling (2022) indicate that travel satisfaction can directly influence travel attitudes, while indirectly influence travel mode choice (via attitudes). However, up till now, no study has analysed these effects. Several studies have also suggested that travel satisfaction can influence long-term well-being (De Vos & Witlox, 2017; Mokhtarian, 2019). Bergstad et al. (2011) found that satisfaction with daily travel has positive impacts on affective well-being, weekly mood, and life satisfaction. Also, Friman, Gärling, et al. (2017) found that satisfaction with daily travel positively impacts the mood in the last month, and satisfaction with life. Similarly, De Vos (2019) found positive influences of travel satisfaction (i.e., leisure trips) on life satisfaction.

Travel satisfaction may not only impact (short- and long-term) well-being, it can also affect satisfaction with – and performance of – the activity at the destination. De Vos (2019) found that satisfaction with the most recent out-of-home leisure activity is positively influenced by satisfaction with the trip to that activity. Loong, van Lierop, and El-Geneidy (2017) indicate that satisfaction with travel is associated with higher odds of feeling energized and being punctual when arriving at work or school. Westman, Olsson, Gärling, and Friman (2017), found that children's (10–15 year) mood at school was worse when travelling to school by car and for longer than 15 min; a result more pronounced for the morning mood than the afternoon mood. In another study focusing on children (9–10 years), Stark, Meschik, Singleton, and Schützhofer (2018) discovered that emotions during the first school lesson were highest for children travelling by active travel modes. De Reuver and Biron (2024) found that mental effort during the commute contributed to burnout reactions upon arrival at work, and consequently reduced job performance. In a study on Chinese nurses, Li et al. (2025) found that commuting stress negatively impacts emotional well-being at work. Some studies have indicated that emotions experienced during travel can linger and influence people's mood after the trip. Friman, Olsson, et al. (2017), for instance, found that travel characteristics (e.g. travel mode, travel duration) can influence people's mood directly after the commute, but do not influence the mood later in the day.

In sum, some studies have explored how travel characteristics can influence people's mood and activity performance after travel. However, to the best of our knowledge, no studies have simultaneously analysed how travel satisfaction (itself influenced by trip characteristics) affects mood after travel and the performance of activities. It is, however, possible that there is a spill-over effect of travel satisfaction on later emotions. This idea can be grounded in affective spillover concept, which shows that emotions generated in one context can carry over and influence subsequent experiences. A smooth, comfortable, or enjoyable travel tends to produce a positive mood that enhances focus, calmness, and readiness to participate in early tasks. Conversely, a stressful or uncomfortable travel can lead to negative emotions that may weaken attention, energy, and motivation. In this sense, trip satisfaction serves as an emotional primer that shapes how individuals perform initial activities in destinations, even when those activities are unrelated to the travel experience itself. In psychological research, particularly within work-family studies, affective spillover has been well-documented, showing, for example, that stress from work can affect family interactions and vice versa. This study builds on such insights by applying the concept of (affective) spillover (e.g., Bakker & Demerouti, 2013; Edwards & Rothbard, 2000) to the context of travel, examining how emotional states produced during the travel influence emotional readiness and the perceived quality of early activities at the university. Edwards and Rothbard (2000), for instance, found that work satisfaction and mood during work influences family role performance and how a person feels about his or her family. Other studies found that family stress can negatively influence school performance of children (Fletcher, 2010; Flook & Fuligni, 2012). Similar to the above life domains, it is possible that emotions experienced during a trip can influence how people perceive activities at the destination of a trip. In this study we will explore how travel satisfaction influences emotions upon arrival and the performance of the first activity after arriving, while taking into account socio-demographics and trip characteristics (Fig. 1). In a first step, we will explore how trip satisfaction, emotions upon arrival, and perceived activity performance differ according to travel mode and trip duration (using one-way ANOVAs). In a next step, we will perform a structural equation model (SEM) to analyse direct and indirect effects between satisfaction, emotions and activity performance, while controlling for trip characteristics (i.e., duration, mode, companionship, congestion, crowding, noise, and weather conditions (sunny, rainy, windy, cold, and dark)) and socio-demographics (i.e., age, gender, travel disability, and role at UCL).

2. Data and methodology

2.1. Sampling and data characteristics

This study draws on data from the 2023 University College London (UCL) travel survey (De Vos, 2023). The survey gathered data from UCL students and staff to gain insights into their travel habits and experiences, with the primary aim of enhancing the sustainability and convenience of travel associated with UCL. This analysis focuses on data from the first part of the survey, specifically examining how respondents travel to campus and their satisfaction, emotions and experiences of these journeys.

Data collection took place during the final four weeks of Term 2, spanning February 27 to March 27, 2023. The survey was

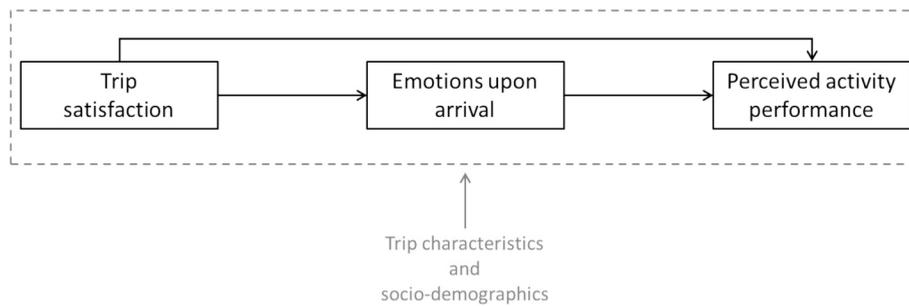


Fig. 1. Conceptual framework.

disseminated via UCL newsletters targeting staff and students, as well as through UCL's social media platforms. To encourage participation, respondents were offered a chance to win one of eight £50 multi-store gift vouchers, with winners selected in April 2023. Ultimately, 2593 UCL staff and students completed the survey. After removing respondents with missing values on key variables, the final sample consisted of 2295 participants for analysis in this study. By doing so, we can use fully completed surveys while still having a large sample, enabling us to estimate relationships between variables with ample confidence.

Respondents are relatively young (35.2 years), which is not surprisingly due to the presence of University students. The majority of respondents live within Greater London (63.7%), while women are overrepresented as they account for 67.0% of the total sample (while only 55% and 61% of respectively UCL staff and students are female).³ Since this study explores relationships among multiple variables rather than providing a descriptive analysis of the population, a large and sufficiently diverse sample is more important than a fully representative sample. Somewhat more than a third of the respondents are (PhD) students (36.5%), almost one in four (23.7%) are research or teaching staff, while administrative staff, professorial staff, and other roles at UCL account for 19.9%, 13.0% and 6.9%, respectively. As a result, staff members are overrepresented and students underrepresented in our sample (since the overall UCL student/staff ratio is around 2.8 to 1).⁴ For more information on the sample recruitment and data characteristics, see De Vos et al. (2025a, 2025b).

2.2. Travel to campus

In the survey, we asked respondents detailed information regarding their most recent, normal trip to the campus they most frequently travel to. The majority of participants (75.0%) travelled to UCL by public transport (bus/tram: 6.5%; underground/overground: 39.3%; train: 29.2%), followed by walking (11.7%), and using bicycles or e-scooters (10.6%). Other travel modes (e.g., car, motorcycle) were only used by 2.7% of the respondents.⁵ These high levels of public transport use and low driving levels are not uncommon for travel to and within inner London (City of London, 2024), and can be explained by an extensive public transport network, high congestion levels and limited parking availability. Additionally, almost four in ten workers in Central London have a commute of at least one hour (Department for Transport 2022). This is in line with our respondents, who have an average one-way travel durations to campus of 53.8 min, with 31.1% of respondents travelling more than 60 min. This can be partly explained by rather long commute distances, as most respondents (60.7%) travel longer than 10 km to campus. Most respondents (94.2%) travelled alone to campus, while a considerable share of respondents indicated that it was cold, crowded, and windy during their trip to campus (77.4%, 39.5%, and 31.9%, respectively). Around one in five respondents also indicates that it was rainy and/or congested (both 19.3%).

We also asked respondents to what extent they agree on ten statements regarding the experience of their most recent trip to campus, the emotions they experienced upon arrival, and how their trip affected their first activity after arriving at UCL. Respondents rated their level of (dis)agreement with each statement on a five-point Likert scale ranging from (1) *strongly disagree* to (5) *strongly agree* (Fig. 2). In terms of trip satisfaction, respondents mostly indicate that their trip to campus went smoothly, but for almost half of them (48.4%), it was not the best trip they could imagine. The emotions when arriving at UCL are rather balanced. Quite a lot of respondents (44.1%) indicate to be tired upon arrival, while stress levels seem relatively low (as more people disagree (43.1%) than agree (24.6%) to feel stressed upon arrival). Finally, most respondents (64.5%) indicate that their first activity after arriving at UCL was productive and satisfying, while only 14.2% of them indicated that their trip to UCL had a negative impact on their first activity after arrival.

³ See: <https://www.ucl.ac.uk/human-resources/about-hr/workforce-reporting-and-analytics>, <https://www.ucl.ac.uk/srs/student-statistics>

⁴ See: <https://www.ucl.ac.uk/about/who-we-are/facts-and-figures>

⁵ In the remainder of the paper, we will refer to (the dominant modes) bus, underground, cycling, and car (instead of bus and tram, underground and overground, cycling and micromobility, and car and motorcycle, respectively) for simplicity reasons.

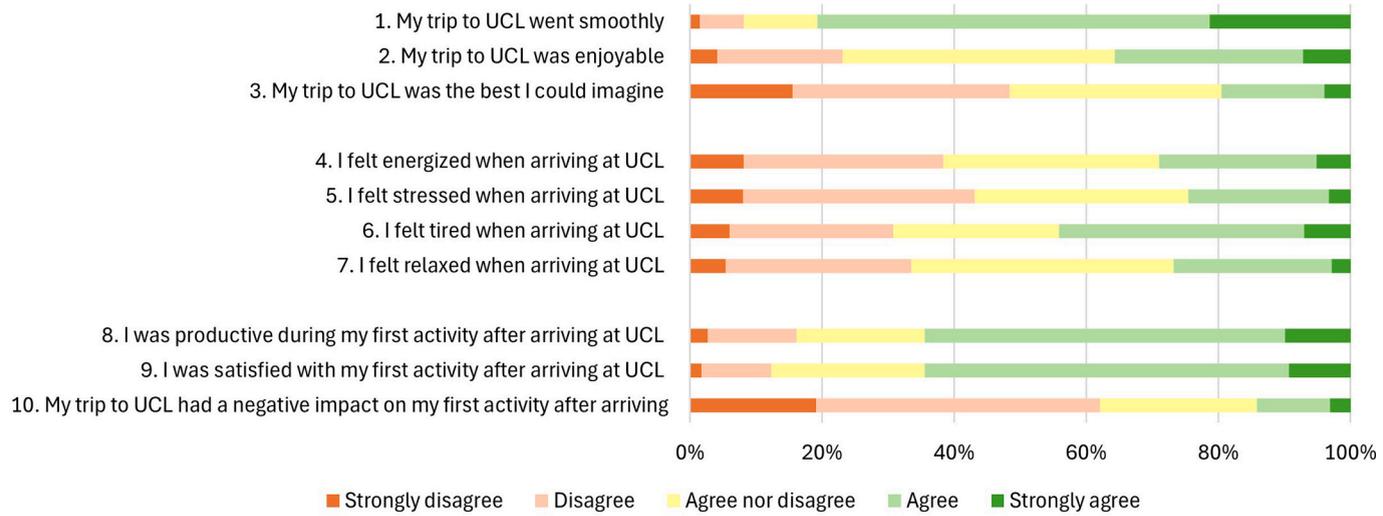


Fig. 2. Trip satisfaction, emotions upon arrival, and perceived activity performance.

3. Results

3.1. The relationship between (i) trip characteristics and (ii) trip satisfaction, emotions upon arrival, and perceived activity performance

In a first stage, we will analyse – by performing one-way ANOVAs – how levels of trip satisfaction, emotions upon arrival and perceived activity performance differ according to the used travel mode and commute duration. In order to do so, we created one variable for each element by averaging the scores of the statements 1 to 3, statements 4 to 7, and statements 8 to 10, respectively. Three statements (statements 5, 6, and 10) were reverse coded as they represented negative emotions/effects. Since the internal consistency of the statements can be considered as good (Cronbach's α of 0.74, 0.82, and 0.82, respectively), averaging the scores of the statements for trip satisfaction, emotions upon arrival, and perceived activity performance results in reliable new variables. The average scores of the new variables are 3.2, 3.0, and 3.6, respectively.

Figs. 3–5 present violin plots with overlaid boxplots showing the distribution of trip satisfaction, emotions upon arrival, and perceived activity performance scores by travel mode and durations. Fig. 3 displays the distribution of trip satisfaction scores across six travel modes, and three commute duration categories. The violin plots reveal higher median satisfaction for active modes (especially walking), while public transport modes (especially train and underground) show relatively lower central tendency and more concentrated distributions. Car users reported moderate satisfaction levels, with slightly less variation compared to public transport users. An ANOVA revealed a statistically significant effect of travel mode on trip satisfaction ($p < 0.01$). Post hoc comparisons (Tukey-adjusted) show that walking was associated with significantly higher trip satisfaction than all other modes (at $p < 0.01$). Cyclists also reported significantly greater satisfaction than bus, train, and underground (at $p < 0.01$). Differences between the public transport modes (bus, train, underground) and car were not significant. For commute duration, satisfaction decreases steadily as trip duration increases. This pattern was supported by ANOVA results indicating a significant effect of travel duration on trip satisfaction ($p < 0.01$).

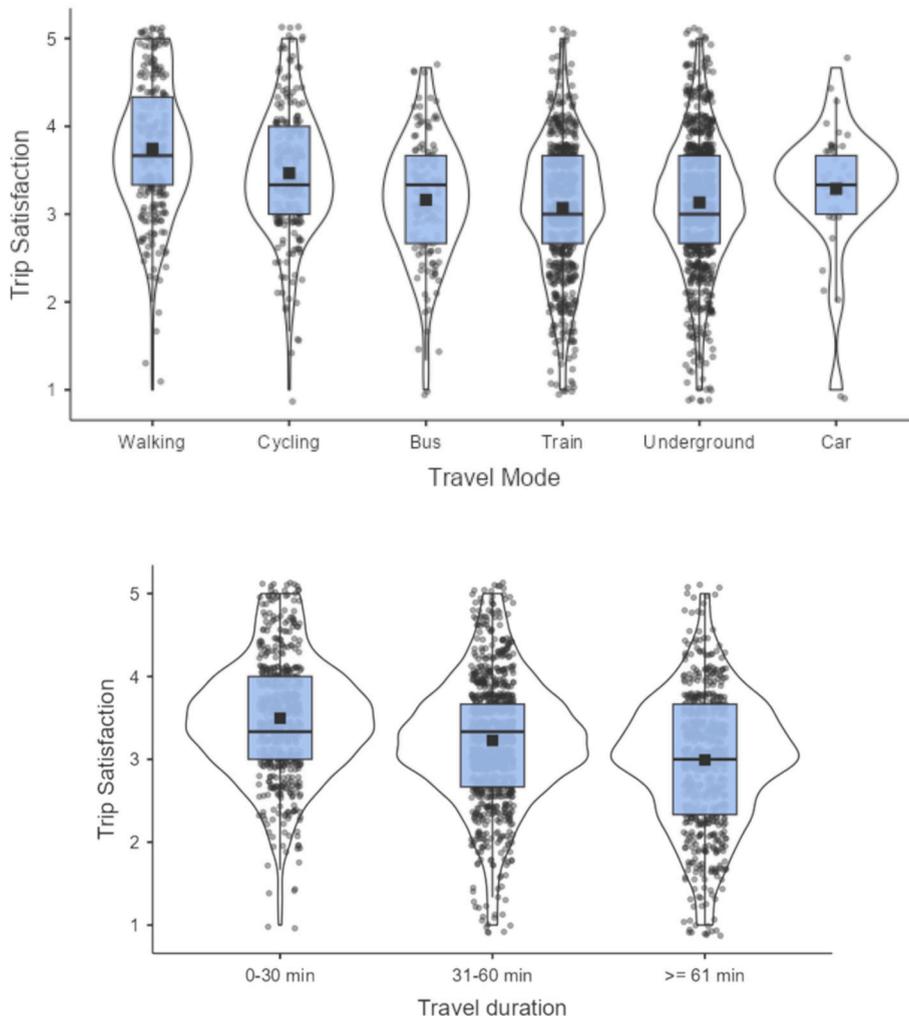


Fig. 3. Distribution of trip satisfaction score by travel mode and duration.

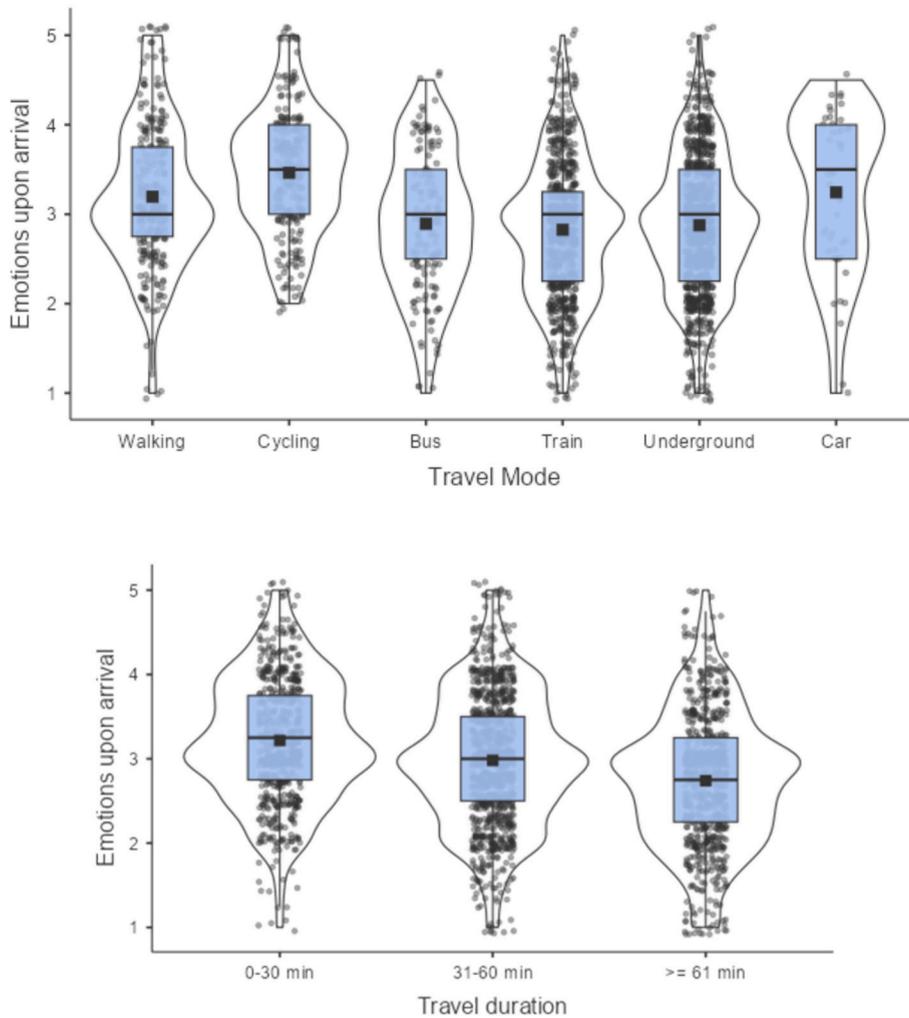


Fig. 4. Distribution of emotions upon arrival by travel mode and duration.

Post hoc tests revealed that participants with short trips (0–30 min) reported significantly higher satisfaction than those with medium (31–60 min) and long trips (≥ 61 min) (at $p < 0.01$). Additionally, medium-duration trips were rated significantly more satisfying than long-duration trips (at $p < 0.01$).

Fig. 4 shows the distribution of emotion levels upon arrival according to travel mode and commute duration. The violin plots reveal high median levels of emotions for car users and those cycling, while public transport users show relatively low median levels of emotions. An ANOVA revealed a statistically significant effect of travel mode on emotions upon arrival ($p < 0.01$). Post hoc comparisons (Tukey-adjusted) indicate that those cycling have significantly higher levels of emotions compared to those walking or using public transport (at $p < 0.01$). Those walking experience more positive emotions upon arrival compared to public transport users, while car users experience more positive emotions compared to train users (at $p < 0.01$). No significant differences were found between the three public transport modes. For commute duration, we see again that levels are highest for those having short commutes, and lowest for those having long commutes (Fig. 4). Post hoc tests indicate that respondents with short trips (0–30 min) report higher levels of positive emotions upon arrival than those with medium (31–60 min) and long trips (≥ 61 min), while medium-duration trips result in more positive emotions compared to long-duration trips (at $p < 0.01$).

The perceived activity performance seems highest for respondents travelling by active travel modes to campus, while somewhat lower for those driving or using public transport (Fig. 5). ANOVA post hoc comparisons (Tukey-adjusted) show that those walking and cycling experience their activity upon arrival better than those travelling by public transport (at $p < 0.01$). Between other travel modes, no significant differences were found. For commute duration, we find that levels of perceived activity performance are highest for short commuters and lowest for long commuters (Fig. 5). Post hoc tests show that those with short trips (0–30 min) experience their activity upon arrival better compared to those with medium (31–60 min) and long trips (≥ 61 min), while medium-duration trips result in more rewarding activities compared to long-duration trips (at $p < 0.01$).

It should be noted that – despite the significant differences by mode and commute duration – the mean differences between modes

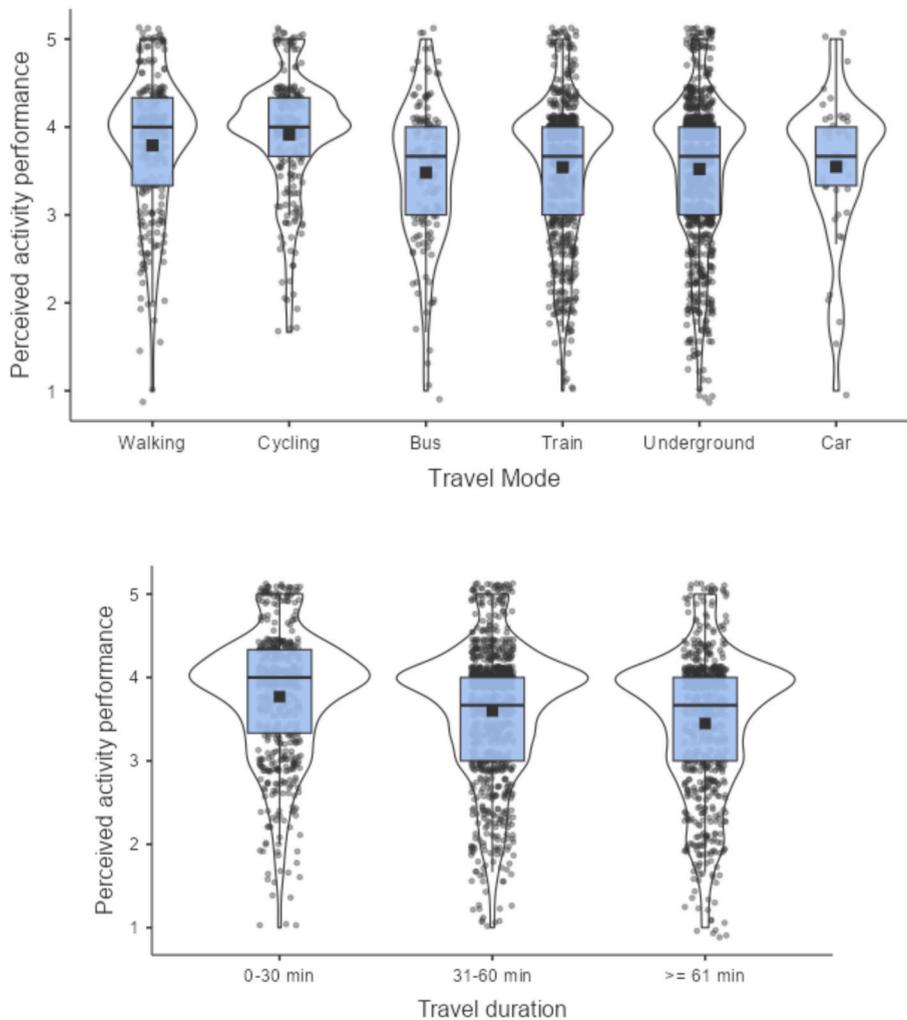


Fig. 5. Distribution of perceived activity performance by travel mode and duration.

and durations are highest for trip satisfaction (up to 0.67 for mode and 0.50 for durations), slightly lower for emotions upon arrival (up to 0.64 for mode and 0.48 for durations), and lowest for perceived activity performance (up to 0.43 and 0.32 for mode and duration, respectively). This suggests that travel mode and trip duration have a stronger impact on satisfaction with the trip and emotions afterwards than on the perceived performance of the activity after the trip.

3.2. A structural equation model

To test the conceptual model developed in Fig. 1, a structural equation model (SEM) – enabling the measurement of both direct and indirect effects – is employed. SEM is commonly used in theory-driven modelling frameworks, where the relationships between variables are guided by previous studies or established theories. Several travel behaviour studies have applied an SEM to analyse (in) direct relationships between travel-related elements (e.g., Bagley & Mokhtarian, 2002; Cao, Mokhtarian, & Handy, 2007; De Vos, 2019; Mouratidis, Ettema, & Næss, 2019). Our SEM comprises two parts: a measurement model and a structural model. The measurement model, which examines the covariance and item associations of three latent factors – trip satisfaction, emotions upon arrival, and the experience of the first activity at the destination – is initially tested using confirmatory factor analysis (CFA). Once the measurement model is confirmed, the full model, including the structural relationships, is tested using SEM. The simultaneous modelling of the measurement component (relationships between observed indicators and latent constructs) and the structural component (e.g. regressions among latent and observed variables), makes SEM an ideal approach for analysing our conceptual model.

CFA and SEM have the same model fit indices. Fit indices in SEM are crucial for evaluating how well a model fits the observed data, with absolute and incremental fit indices being among the most commonly reported. Absolute fit indices, such as the chi-square test (χ^2), RMSEA, and SRMR, directly assess how well the model reproduces the observed data (Kline, 2023). RMSEA values below 0.08 indicate an acceptable fit, and values below 0.06 suggest a good fit, while SRMR values below 0.08 are generally considered

acceptable. Incremental fit indices, including the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), compare the proposed model to a baseline model. CFI and TLI values above 0.90 indicate acceptable fit, and values exceeding 0.95 reflect excellent fit (Kline, 2023). Stata version 18 was used to test the models.

3.2.1. Outcomes of the SEM

The measurement model of the latent variables was evaluated using CFA with the maximum likelihood estimation method. The initial model fit indices indicated that the model did not adequately fit the sample data ($\chi^2 = 947.55$, RMSEA = 0.108, SRMR = 0.064, CFI = 0.92, TLI = 0.89). To identify potential sources of model misfit, modification indices were examined, as they provide insights into parameters that, if freely estimated, could significantly improve model fit. This approach is consistent with established practices in CFA when the theoretical framework allows for such adjustments. Based on the modification indices, three error covariances were added between three items (statements 4 and 5, statements 5 and 6, statements 8 and 9), as these suggested areas of shared variance were not accounted for by the initial model. These correlations were deemed theoretically plausible due to similar item wording. After introducing these correlations, model fit improved substantially, with fit indices indicating a good fit to the data ($\chi^2 = 354.20$, RMSEA = 0.070, SRMR = 0.031, CFI = 0.97, TLI = 0.95). In addition, all factor loadings of the indicators for each latent factor are greater than 0.6, which is considered favourable.

The next step was to test the full SEM. The results show a satisfactory fit ($\chi^2 = 1028.30$, RMSEA = 0.047, SRMR = 0.024, CFI = 0.93, TLI = 0.90). Overall, the predictors explain 38%, 70%, and 70% of variables of trip satisfaction, emotions and activity experience at destinations, respectively. The standardized effects of the statistically significant relationships in the structural part of the model are shown in Fig. 6. It should be noted that, although six travel modes were tested separately in the earlier ANOVAs, in the SEM analysis, bus, train, and underground were combined into a single public transport variable as they have very similar effects on trip satisfaction, emotions upon arrival and perceived activity performance. As a result, three travel modes (walking, cycling, and public transport) were included as covariates in the model, with car used as the reference category. Regarding travel duration, the original variable was measured on a continuous scale in the survey, which was retained in the SEM analysis. However, for the purposes of the earlier ANOVAs and descriptive analysis, travel duration was converted into an ordinal/categorical variable to more clearly illustrate differences in trip satisfaction, emotions, and activity experience between short, medium, and long trips.

The results of the structural part (including significant and non-significant coefficients) can be found in Table 1. Trip satisfaction had the strongest direct effect on emotions upon arrival ($\beta = 0.81$, total effect = 0.81), and emotions in turn had a substantial effect on the experience of activity at the destination ($\beta = 0.64$, total effect = 0.64). Although the direct effect of trip satisfaction on experience was modest ($\beta = 0.18$), its total effect was considerably larger ($\beta = 0.70$), indicating a strong and statistically significant indirect effect through emotions. This finding supports the theorized sequential pathway in which trip satisfaction shapes emotional responses upon

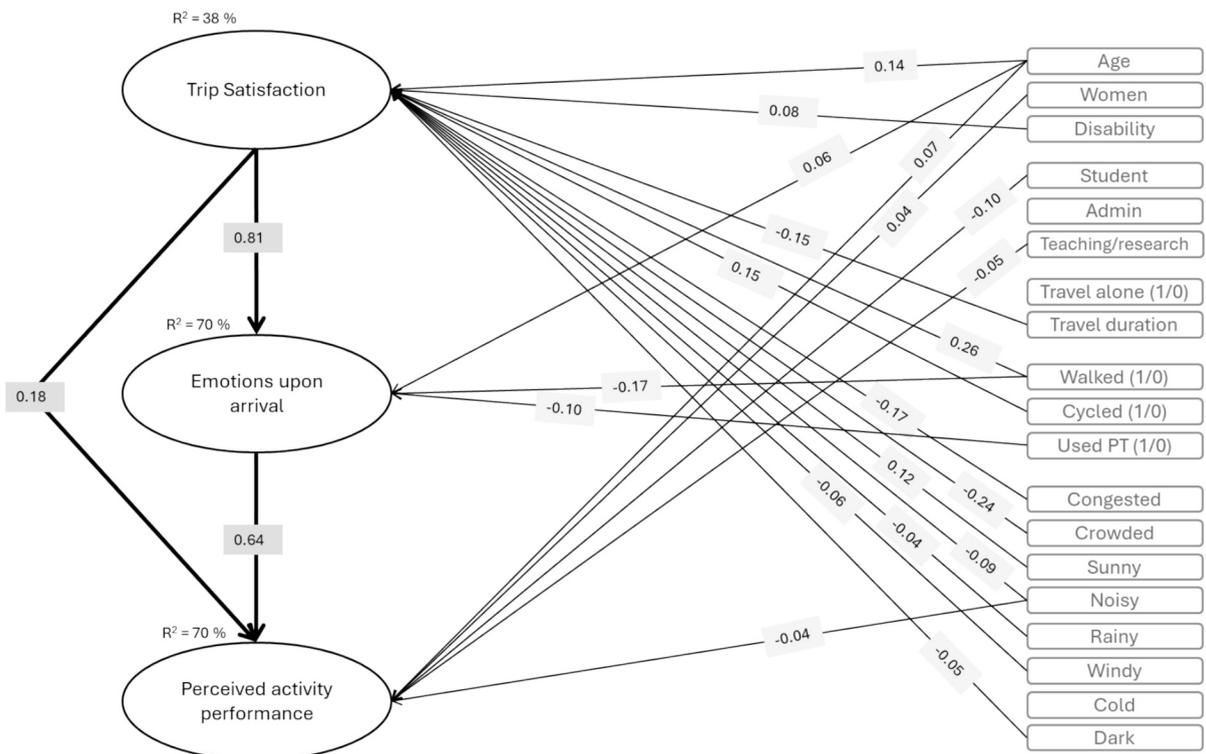


Fig. 6. Standardized effects from statistically significant ($p < 0.05$) structural relationships.

Table 1
Standardized direct (and total) effects of the structural relationships.

Predictor	Trip satisfaction	Emotions upon arrival	Perceived activity performance
Age	0.14* (0.14*)	0.06* (0.20*)	0.07* (0.23*)
Women	-0.01 (-0.01)	-0.02 (-0.02)	0.04* (0.03)
Disability	0.08* (0.08*)	0.03 (0.11*)	0.01 (0.09*)
Student	0.06 (0.06)	-0.03 (0.01)	-0.10* (-0.09*)
Administration	0.04 (0.04)	-0.01 (0.01)	-0.02 (-0.00)
Research/Teaching Fellow	0.01 (0.01)	-0.00 (0.00)	-0.05* (-0.05)
Travel alone	-0.01 (-0.01)	-0.01 (-0.03)	0.01 (-0.00)
Travel duration	-0.15* (-0.15*)	-0.02 (-0.16*)	-0.03 (-0.17*)
Walking	0.26* (0.26*)	-0.17* (0.04)	0.06 (0.14*)
Cycling	0.15* (0.15*)	0.01 (0.15*)	0.03 (0.16*)
Public transport	0.05 (0.05)	-0.10* (-0.06)	0.07 (0.05)
Congested	-0.17* (-0.17*)	0.01 (-0.14*)	0.00 (-0.11*)
Crowded	-0.24* (-0.24*)	0.03 (-0.17*)	0.02 (-0.13*)
Sunny	0.12* (0.12*)	0.00 (0.11*)	-0.03 (0.06*)
Noisy	-0.09* (-0.09*)	-0.01 (-0.09*)	-0.04* (-0.13*)
Rainy	-0.04* (-0.04*)	-0.01 (-0.06*)	-0.02 (-0.06*)
Windy	-0.06* (-0.06*)	0.00 (-0.05*)	0.01 (-0.03)
Cold	-0.00 (-0.00)	-0.01 (-0.01)	0.01 (-0.00)
Dark	-0.05* (-0.05*)	0.00 (-0.05*)	-0.02 (-0.06*)
Trip satisfaction	-	0.81* (0.81*)	0.18* (0.70*)
Emotions upon arrival	-	-	0.64* (0.64*)

arrival, which in turn enhances the overall experience of the activity at the destination.

Total effects also revealed meaningful differences from direct effects in several key predictors. Age, for instance, had a direct effect on trip satisfaction ($\beta = 0.14$), but its influence on emotions (total $\beta = 0.20$) and experience (total $\beta = 0.23$) was amplified through indirect pathways. Similarly, individuals with disabilities reported higher trip satisfaction ($\beta = 0.08$), and their total effects on emotions ($\beta = 0.11$) and experience ($\beta = 0.09$) were statistically significant, despite small or non-significant direct coefficients, suggesting substantial indirect effects via trip satisfaction. Gender differences were only evident in experience of activity, with women reporting higher scores ($\beta = 0.04$, total effect = 0.03), while gender did not significantly explain trip satisfaction or emotions.

The role of travel mode was mixed. Walking was positively associated with trip satisfaction ($\beta = 0.26$), but negatively with emotions ($\beta = -0.17$). However, the total effect of walking on emotions was positive ($\beta = 0.04$), suggesting that its initial negative emotional impact may be offset by satisfaction gained from the trip. Its total effect on experience was also higher ($\beta = 0.14$) than the direct effect. Cycling also showed stronger total effects on both emotions ($\beta = 0.15$) and experience ($\beta = 0.16$), despite modest direct effects. Public transport had a negative direct effect on emotions ($\beta = -0.10$), but no significant total effect on experience.

Travel duration was negatively associated with trip satisfaction ($\beta = -0.15$), and although its direct effects on emotions and experience were small, the total effects ($\beta = -0.16$ and -0.17 , respectively) indicate cumulative negative impacts along the pathway. Environmental and trip characteristics, including congestion, crowding, noise, rain, and darkness, also showed broader negative effects. For example, while noise had a modest direct effect on experience ($\beta = -0.04$), its total effect was larger ($\beta = -0.13$). Similar patterns were observed for crowding (total effect on experience = -0.13), congestion (-0.11), and rain (-0.06). These results suggest that such trip conditions primarily operate through reduced satisfaction, which in turn leads to reduced emotions and less positive activity experiences.

Finally, occupational roles showed some variation. Students had a significantly negative effect on experience of activity (direct $\beta = -0.10$, total $\beta = -0.09$), while research or teaching fellows also reported a modest negative effect ($\beta = -0.05$). Administrative staff did not differ significantly from professional staff in any of the outcome variables. Travelling alone and cold weather conditions had no meaningful effects in the model.

4. Discussion and conclusion

In this study, we analysed trip satisfaction, emotions upon arrival and the perceived performance of the activity at the destination. In a first step, we looked at how they are influenced by mode choice and trip duration. In line with existing travel satisfaction studies, we found that active travel modes and short trips result in high levels of travel satisfaction (e.g., De Vos et al., 2016; Singleton, 2019; St-Louis et al., 2014; Ye & Titheridge, 2017), positive emotions after travel (e.g., Friman, Olsson, et al., 2017), and the perceived performance of the activity at the destination (e.g., Loong et al., 2017; Stark et al., 2018; Westman et al., 2017). We did find that the effect of travel characteristics is stronger on travel satisfaction and emotions upon arrival than on the perceived activity performance. This may not be that surprising since activity performance is likely strongly influenced by the activity itself. The SEM results indicate that the effects of travel mode and duration on trip satisfaction are strong, while their effects on emotions upon arrival and perceived activity experience are mostly insignificant. However, total effects are often significant, due to strong indirect effects via trip satisfaction. This is because trip satisfaction has a strong positive influence on emotions upon arrival, which in turn positively influences perceived activity performance. The latter is in line with De Vos (2019) who found that satisfaction with the most recent out-of-home leisure activity is positively influenced by satisfaction with the trip to that activity. In sum, strong spill-over effects of travel on activity

experience exist. This suggests that travel is more than just a derived demand. It is not simply a disutility to be endured to reach out-of-home activities (as argued earlier by e.g., [Mokhtarian & Salomon, 2001](#)); travel can impact people's mood after arriving and the performance/experience of activities. Hence, it further emphasizes the important role travel can have in affecting people's quality of life and subjective well-being.

The results show the important role that travel has on people's mood and the performance of activities after arrival. Travelling short durations with active travel modes will result in satisfying trips, which in turn can improve the mood upon arrival and result in a satisfying/rewarding performance of the activity after travel. Hence, it is important to further stimulate short and active travel, e.g., by implementing transport planning concepts such as the 15-min city, focusing on urban planning principles, such as density, mixed use, and proximity (e.g., [Carvalho, Farber, Manaugh, & El-Geneidy, 2025](#)). Although implementations of the 15-min city concept in London in the form of low-traffic neighbourhoods have proven to be successful in stimulating active travel (e.g., [Aldred, Verlinghieri, Sharkey, Itova, & Goodman, 2021](#)), we do acknowledge that short and active trips for commuting purposes may be difficult to realise in large cities with most employment clustered in the city centre (e.g., [Birkenfeld, Carvalho, & El-Geneidy, 2024](#)). Additionally, policy makers and public transport operators could try to make public transport use more satisfying. Since previous research (e.g., [Lunke, 2020](#); [Soza-Parra, Raveau, Muñoz, & Cats, 2019](#)) – supported by outcomes from this study – have indicated that crowding and congestion have strong negative effects on public transport satisfaction, public transport operators – in collaboration with local governments – should try to create more efficient services, e.g., by increasing the service frequency and (seating) capacity, and implementing dedicated lanes for buses and trams. More satisfying public transport trips will likely result in a better mood and better perceived activities upon arrival. Results of this study are also valuable for employers. In order to improve job productivity and satisfaction, employers can try to stimulate more active travel to work, e.g., by relocating to compact, mixed use areas, improving walkability around offices, and provide facilities for cyclists (e.g., bicycle parking, bicycle maintenance, and access to showers and lockers ([Wilson et al., 2018](#))).

In this study we used a convenience sample (University staff/students) from one large global city, limiting the external validity of the outcomes. Hence, we recommend future studies to explore the links between travel satisfaction and emotions/activity performance upon arrival by using a more representative sample of people working in various employment sectors. Also, a sample less dominated by women may result in deviating outcomes, as the impact of commutes on emotional well-being and mental health may differ by gender ([Roberts, Hodgson, & Dolan, 2011](#)). Additionally, other trip purposes – and types of out-of-home activities – could be explored. Data from other geographical areas and smaller cities could explore whether the effects of trip characteristics and the found spill-over effects also hold true in other contexts. Besides effects of travel on activities at the destination, we also recommend studies to look at potential (spill-over) effects of the activity (and accompanying emotions) at the origin of the trip on the experience of travel and the activity at the destination, e.g., the effect of mood in the morning at home on travel and activity at work, or the effect of the work activity on the commute back home and activities at home in the evening. Finally, we would recommend future studies to include measures of subjective well-being and life satisfaction in their surveys. Since perceived activity performance is likely to influence people's well-being, important (indirect) effects of travel and travel satisfaction on well-being can be expected.

CRediT authorship contribution statement

Jonas De Vos: Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Milad Mehdizadeh:** Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Formal analysis, Conceptualization.

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

The data that has been used is confidential.

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