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Travel satisfaction revisited.
**On the pivotal role of travel satisfaction in conceptualising a travel
behaviour process**

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On the pivotal role of travel satisfaction in conceptualising a travel behaviour process

Abstract

Over the past years a substantial amount of studies has indicated that travel satisfaction is affected by a wide range of elements such as trip duration, travel mode choice and travel-related attitudes. However, what is less explored is that this travel satisfaction is not only an outcome of travel-related preferences and choices, but that travel satisfaction can also be a predictor of travel-related components. In this conceptual paper we tend to fill the gaps in the existing – albeit rather fragmented – literature concerning travel satisfaction. We provide an overview of the elements explaining travel satisfaction, and possible outcomes of travel satisfaction, with a focus on (i) subjective well-being, (ii) travel mode choice, (iii) travel-related attitudes, and (iv) the residential location. Furthermore, we suggest a continuous cyclical process including the four above mentioned elements in which travel satisfaction plays an essential role; a process which can result in the formation of travel habits.

Keywords: Travel satisfaction; Subjective well-being; Travel mode choice; Attitudes; Residential location; Habits

1. Introduction

Over the past years, a growing body of studies have analysed how satisfied people are with and while travelling. Although previous studies often use the term travel satisfaction to refer to both satisfaction with one specific trip and satisfaction with travel in general, we think it is important to make a distinction between what we refer to as trip satisfaction and satisfaction with daily travel. Trip satisfaction refers to the experienced emotions – or people’s mood – during a trip and a cognitive evaluation of this trip; while satisfaction with daily travel refers to how satisfied people are with their daily travel patterns, possibly split up according to different types of trips (e.g., commute trips, leisure trips). The Satisfaction with Travel Scale (STS) is a domain-specific scale developed to measure how people perceive their travel, which can both be applied to one specific trip or to travel in general (De Vos et al., 2015; Ettema et al., 2011; Friman et al., 2013).

Most studies analysing travel satisfaction focus on elements explaining variations in how satisfied people are with their travel. The effect of trip characteristics – such as trip duration and travel mode choice – on travel satisfaction has been analysed quite frequently (De Vos et al., 2016; Ettema et al., 2011; Mao et al., 2016; Morris and Guerra, 2015a, 2015b; Olsson et al., 2013; St-Louis et al., 2014). Less common, however, are studies focussing on the effects of travel-related attitudes and preferences on how satisfied people are with their trips and travel in general (De Vos et al., 2016; St-Louis et al., 2014; Ye and Titheridge, 2017). Furthermore, it is also possible that long-term (subjective) well-being, such as people’s overall satisfaction with life (i.e., life satisfaction), affects satisfaction with travel (De Vos, 2017).

Previous studies on travel satisfaction have given us some interesting insights into which elements are important predictors of how people perceive their trips. However, travel satisfaction should not be regarded as an endpoint resulting from certain travel behaviour choices and/or the liking to travel in a certain way. As people will mostly try to maximise their happiness and satisfaction, trip satisfaction can possibly affect people's attitudes towards the chosen travel mode and can – as a result – influence future mode choices (De Vos et al., 2017). Some studies also suggest that travel, and satisfaction with this travel, can have an impact on long-term well-being (Bergstad et al., 2011; De Vos, 2017; De Vos et al., 2013; Ettema et al., 2010).

In this paper we will analyse how travel satisfaction both affects – and is affected by – (i) long-term well-being, (ii) travel mode choice, (iii) travel-related attitudes/preferences and (iv) the residential location. Resulting from these relations, we put forward a continuous process in which travel satisfaction plays a pivotal role; a process which can result in possible formation of travel habits. This paper is organised as follows. Section 2 gives an overview of existing studies on travel satisfaction, with a focus on the bidirectional links of travel satisfaction with well-being, mode choice, attitudes/preferences and the residential location. In Section 3 we present a travel-related process in which travel satisfaction plays a key role. Section 4 discusses this process and indicates how this process can result in possible habit formation.

2. Previous studies on travel satisfaction

Studies, mainly since 2010, have indicated that travel satisfaction – both satisfaction with a specific trip and satisfaction with travel in general – is affected by a wide range of elements (including mode choice, trip duration and travel-related attitudes). However, these studies are often rather fragmented and deficient as they mostly focus on only one or two aspects influencing travel satisfaction and do not account for a series of bidirectional relationships. In the following sections we explain how travel satisfaction has bidirectional relationships with long-term well-being, travel mode choice, travel-related attitudes and the residential location.

2.1 A bidirectional relationship between travel satisfaction and long-term well-being

Travel satisfaction can be regarded as a part of Subjective Well-Being (SWB) (De Vos et al., 2013; Ettema et al., 2010). According to Diener et al. (1999), this SWB consist of four elements: the presence of positive feelings, the absence of negative feelings, domain satisfaction and overall satisfaction with life. The experience of positive and negative feelings pertains to the short term and is often referred to as a person's mood, or emotional well-being. Domain satisfaction can be referred to as a medium-term satisfaction with certain domains in life (e.g., job satisfaction, satisfaction with social relationships). Life satisfaction is a cognitive evaluation of how good one's life is over a longer period of time. In terms of travel, trip satisfaction refers to the presence (or absence) of positive (or negative) feelings during a particular trip, possibly in combination with a cognitive evaluation of that trip. Trip satisfaction can therefore be regarded as a part of short-term SWB. Satisfaction with daily travel can be regarded as (medium-term) domain satisfaction.

Life satisfaction is related with both the experience of negative/positive emotions and satisfaction in certain domains in life. Individuals who have high levels of emotional well-being (i.e., who experience more frequent positive emotions and less frequent negative emotions) are often successful in – and

satisfied with – multiple life domains. Experiencing positive emotions also stimulates elements positively affecting life satisfaction, such as original thinking, fostering skills and behaviour, and liking of self and others (Lyubomirsky et al., 2005a). Furthermore, domain satisfaction has a direct, positive effect on life satisfaction (e.g., Schimmack, 2008). Besides these bottom-up effects from short-term and medium-term satisfaction on long-term life satisfaction, it is also possible that top-down effects exist in which people with high levels of life satisfaction experience more frequent positive emotions compared to people with lower levels of life satisfaction. These top-down effects from life satisfaction on emotional well-being can happen both directly and indirectly through domain satisfaction (e.g., Diener, 1984; Feist et al., 1995; Headey et al., 1991).

From a travel point of view, this suggests that both trip satisfaction and satisfaction with daily travel can affect life satisfaction (e.g., Bergstad et al., 2011; De Vos et al., 2013; Ettema et al., 2010). The effect of trip satisfaction on life satisfaction will probably also be indirect, through satisfaction with daily travel, as multiple positively or negatively perceived trips of the same kind might affect satisfaction with daily travel. On the other hand, it is also possible that people evaluating their life positively will have a higher probability of being satisfied with their trips and being more pleased with their travel in general, compared to people with a lower life satisfaction (De Vos, 2017). Hence, a bidirectional relationship seems to occur where travel satisfaction results in a certain level of life satisfaction, while this level of long-term well-being affects the perception of travel (Figure 1).

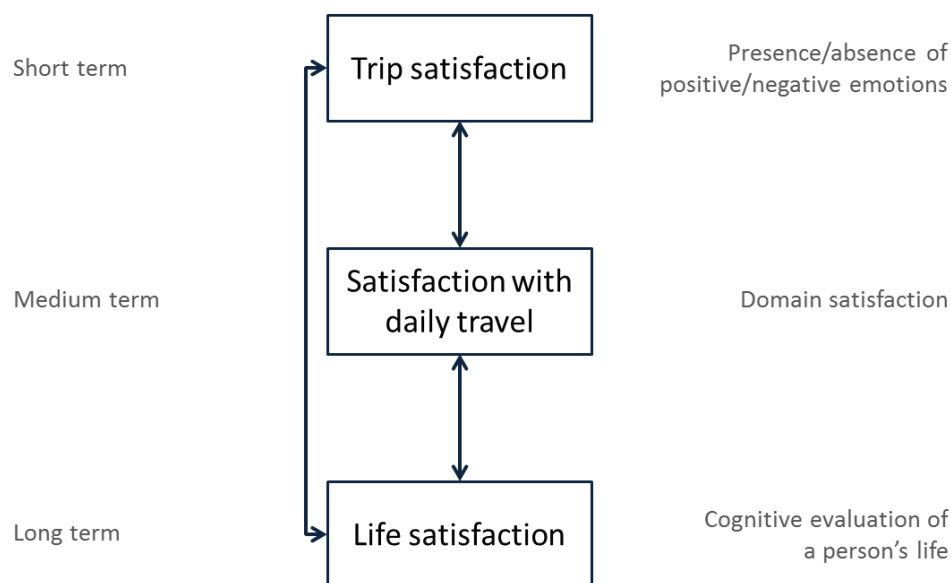


Figure 1. Subjective well-being from a travel's point of view.

Travel will not only affect long-term well-being directly by the experience of emotions during trips or a global evaluation of a person's travel pattern. Since out-of-home activity participation has a clear impact on life satisfaction (Abou-Zeid and Ben-Akiva, 2012; Diener, 2000; Lyubomirsky et al., 2005a), travel – enabling participation in these activities – has an important indirect effect on satisfaction with life. In the worst case scenario of social exclusion, a lack of travel options makes it impossible to engage in rewarding activities, negatively affecting quality of life (e.g., Lucas, 2012). Also, observed spill-over effects of travel on the activity at the destination of the trip are possible (Bergstad et al. 2011; De Vos, 2017; De Vos et al. 2013; Ettema et al. 2010). The (perceived) quality of the trip can

affect the ease with which people perform their activity at the destination of that trip. A stressful and/or tiring commute trip, for instance, might negatively impact performance at work and satisfaction with work (Friman et al., 2017; Legrain et al., 2015; Loong et al., 2017), and can therefore reduce the well-being enhancing effect of the work activity. On the other hand, travel time can give travellers the opportunity to mentally prepare for the activity ahead, facilitating the performance of that activity (Jain and Lyons, 2008; Ory and Mokhtarian, 2005).

Out-of-home activity participation does not only affect satisfaction with life, it can also help people to achieve personal growth and realise the best in oneself. This type of well-being is referred to as eudaimonic well-being and is more than satisfaction of certain needs; it emphasises on the meaning of life and 'flourishing'. Eudaimonic well-being is related with life satisfaction. Although most studies state that eudaimonic well-being is more far-reaching than life satisfaction, other studies indicate that life satisfaction can be seen as an outcome of eudaimonic well-being in which people with a 'full life' (i.e. having high levels of eudaimonic well-being) have a higher life satisfaction than the people with an 'empty life' (Peterson et al., 2005; Seligman, 2002). In this study we assume a bidirectional relationship between life satisfaction and eudaimonic well-being. Since travel is mostly a derived demand, i.e., to enable out-of-home activity participation, the effect of travel (satisfaction) on eudaimonic well-being will mainly be indirect, through the execution of these activities. However, there are studies indicating that travel can offer a positive utility in its own right (Mokhtarian and Salomon, 2001; Mokhtarian et al., 2015; Ory and Mokhtarian, 2005). Travel can increase satisfaction, joy or contentment through movement as such (e.g., due to the sensation of speed, the exposure to the environment, the enjoyment of scenic beauty). In some cases, travel can be regarded as the activity itself, as is the case with recreational walking, jogging or cycling or with just driving around. This 'undirected travel' is usually non-mandatory and undertaken not so much to reach a destination, but to fulfil certain needs such as letting off steam (after a working day), maintaining social relationships or improving personal fitness levels. It is also possible that the demand for an activity arises as a consequence of the desire to travel (e.g., when people decide to eat out instead of staying at home because they have a desire to get out and go somewhere). As a result, travel can help people in their self-development and can therefore contribute to eudaimonic well-being directly. Besides actually realised travel, people's capacity to become mobile (referred to as motility (Kaufmann et al., 2004)), or the value people give to various transport options can affect their eudaimonic well-being (Nordbakke, 2013; Nordbakke and Schwanen, 2014). For instance, having access to many transport resources (e.g., owning a car, living close to a public transport network) and having the knowledge and skills regarding their use can generate feelings of freedom, competence and belonging. Greater motility can also give people the idea and confidence that they are capable of realising certain goals.

Based on the relationships described above, Figure 2 shows how travel satisfaction, satisfaction with the activity at the destination of the trip and long-term well-being (i.e., life satisfaction and eudaimonic well-being) are related with each other, with a focus on commuting and the work activity at the destination. We advocate that job satisfaction is affected by travel satisfaction, just as domain satisfaction is affected by people's mood (absence of negative feelings and presence of positive feelings). Both travel satisfaction and job satisfaction affect long-term well-being. However, for all these relationships feedback mechanisms can apply; long-term well-being can influence short- and medium-term satisfaction, domain satisfaction can affect emotional well-being and it is possible that

travel satisfaction is influenced by satisfaction with the activity at the destination.¹ Although Figure 2 describes the links between people’s mood, domain satisfaction and long-term well-being for commuting and work activities, the same can be applied for other types of trips and activities, such as leisure trips and leisure activities.

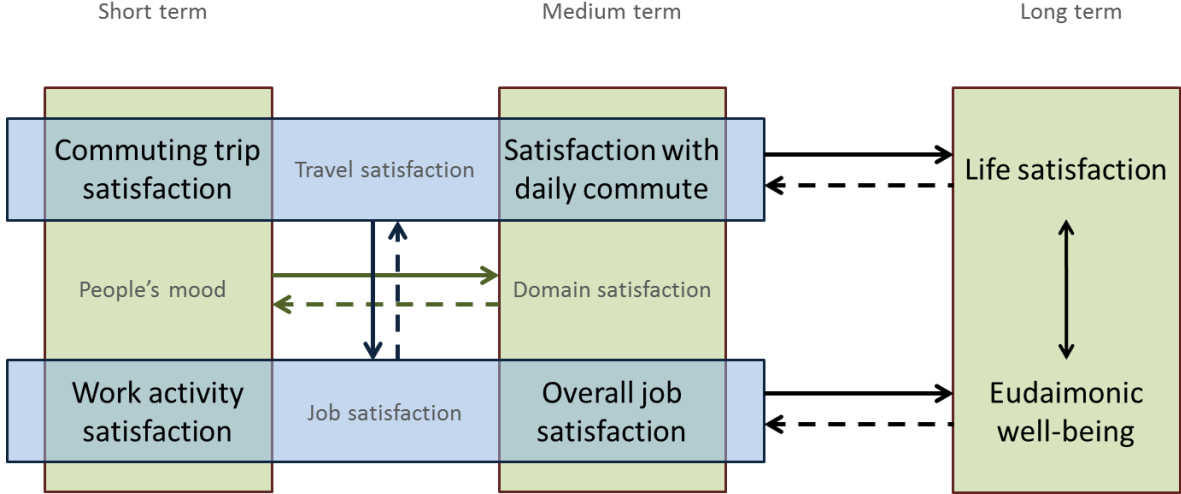


Figure 2: The link between travel satisfaction and long-term well-being applied to commuting.

2.2 A bidirectional relation between travel satisfaction and travel mode choice

Trip characteristics seem to have an important effect on how satisfied people are with their travel. Especially the effect of trip duration on travel satisfaction has been explored frequently. Recent studies found that trip duration tends to affect travel satisfaction negatively. With longer durations, travellers become less enthusiastic, less relaxed and they will evaluate the quality and efficiency of the trip lower (De Vos et al. 2016; Ettema et al. 2011; Mao et al., 2016; Mokhtarian et al., 2015; Morris and Guerra 2015a; Olsson et al., 2013; St-Louis et al., 2014).

However, most elements explaining variations in travel satisfaction are related with travel mode choice. Interestingly, numerous recent studies from different regions of the world indicate that the choice of travel mode has a significant effect on how satisfied we are with a particular trip. People using public transport (bus in particular) seem least satisfied with their trip, while active travel results in the highest levels of travel satisfaction, also in regions with good public transport facilities or limited walking and cycling infrastructure (De Vos et al., 2015, 2016; Ettema et al., 2011; Friman et al., 2013; Legrain et al., 2015; Mao et al., 2016; Mokhtarian et al., 2015; Morris and Guerra, 2015b; Olsson et al., 2013; Páez and Whalen, 2010; St-Louis et al., 2014; Ye and Titheridge, 2017). Up till now it is not really clear what explains these differences according to the travel mode chosen, partly because of a lack of studies using qualitative data.

¹ Abou-Zeid (2009), for instance, indicates that travel satisfaction is highest for activities where individuals experience a high level of happiness when conducting that activity, while Mokhtarian and Salomon (2001) and Ory and Mokhtarian (2005) show that people like leisure trips more than commute trips. These findings suggest that people might confound their liking for travel with their liking for the activity at the destination.

Certain trip characteristics affecting travel satisfaction are tied to the use of a certain travel mode. Car users' trip satisfaction is affected by elements such as congestion levels, experienced traffic safety, travel time reliability, parking availability, annoyance with other road users, and the lack of freedom to choose speed and lane (Ettema et al., 2013; Morris and Hirsch, 2016; Novaco and Gonzalez, 2009; Susilo and Cats, 2014). A relatively large amount of studies have analysed customer satisfaction among public transport riders. The way people perceive public transport trips is influenced by a wide range of elements. Service attributes such as cleanliness, comfort, the personnel's behaviour, safety, punctuality and frequency are most likely to influence public transport users' satisfaction (e.g., de Oña et al., 2013; dell'Olio et al., 2011; van Lierop et al., 2017). Travel satisfaction of active travellers is less examined. Satisfaction with walking and cycling can be affected by weather conditions/seasonality, the presence of slopes, personal fitness levels, and the presence and quality of walking/cycling infrastructure (e.g., wide, well-lit sidewalks and safe (zebra) crossings for pedestrians; separated cycle lanes and cycling parking for cyclists) (Manaugh and El-Geneidy, 2013; Pucher and Buehler, 2008; Willis et al., 2013). Susilo and Cats (2014) indicate that satisfaction with bicycle trips is most positively correlated with the absence of hindrances from other transport modes and a barrier-free, smooth ride. Alfonzo (2005) and Stradling et al. (2007) state that pedestrians' satisfaction is also affected by the aesthetic appeal of the surroundings (e.g., the presence of trees/flowers and architectural elements).

Another element highly affected by the choice of travel mode is the ability to perform certain activities during travel. While activities during trips are mostly limited to activities such as listening to music, enjoying the scenery and talking to co-travellers for active travellers or people using the car, public transport users might also perform other activities such as reading a book, making social phone calls or working/studying (possibly using a laptop). A lot of these activities, such as daydreaming or listening to music, are actually 'anti-activities' giving travellers the chance to time-out (Jain and Lyons, 2008; Mokhtarian and Salomon, 2001). Although these activities might improve the positive utility of travel, some of the activities performed during travel, such as relaxing, reading a book or listening to music, might be attempts to abate boredom (Ettema et al., 2012; Lyons et al., 2007; Mokhtarian et al., 2015).

Although studies have shown that mode choice affects travel satisfaction, it is also possible that travel satisfaction influences mode choice. Over the past decades, travel mode choice has been analysed thoroughly with the help of utility theories. These theories assume that the travel mode with the highest utility – based, among others, on the monetary cost and travel time – will be chosen (Domencich and McFadden, 1975; McFadden, 1986, 2001). However, besides decision utility (referring to choices), utility can also refer to the experience of feelings and emotions, resulting from the outcome of a choice, i.e., experienced utility (Kahneman et al., 1997). In addition to a clear effect of decision utility on experienced utility (e.g., the effect of mode choice on travel satisfaction) it is also possible that experienced utility affects decision utility. For instance, when given the choice of which activity episode to repeat, individuals generally choose the activity that had the highest experienced utility in previous, similar activities (Kahneman and Krueger, 2006). The choice of a travel mode will therefore probably be affected by satisfaction with previous trips using that particular mode. This link between satisfaction and behaviour also seems to be confirmed by studies in the domain of marketing and customer's behaviour. These studies indicate that customer's satisfaction strengthens customer loyalty, meaning that satisfied customers are more likely to

continue using that service (e.g., Olsen, 2007). Some of these studies, focussing on public transport use, indicate that satisfaction with public transport services positively affects the likelihood of continuing to use public transport (Lai and Chen, 2011; van Lierop and El-Geneidy, 2017). Although studies analysing the link from travel satisfaction on mode choice are limited, some studies have found that satisfaction with daily travel of people regularly using a specific mode has a positive effect on using that mode (e.g., Abou-Zeid and Ben-Akiva, 2012; Beirão and Cabral, 2007; Reibstein et al., 1980). It is also possible that the effect of travel satisfaction on travel mode choice is indirect, through travel-related attitudes. Since travel satisfaction can influence travel-related attitudes (see Section 2.3), satisfying trips with a certain travel mode might increase the chance of using that mode for a future trip due to an improved stance towards that mode (De Vos et al., 2017).

2.3 A bidirectional relationship between travel satisfaction and travel-related attitudes

Although most studies indicate that travel satisfaction is affected by external trip characteristics, such as trip duration, congestion levels and travel mode choice, some studies have also shown that travel satisfaction can be affected by personal characteristics. For instance, physical constraints and health problems, hampering walking, cycling and access to (public transport) vehicles, can significantly decrease trip pleasantness (Mokhtarian et al., 2015). Furthermore, internal factors such as travel-related preferences and attitudes can also affect travel satisfaction (De Vos et al., 2016; Manaugh and El-Geneidy, 2013; St-Louis et al., 2014; Ye and Titheridge, 2017). For instance, positive attitudes towards bus use (Reibstein et al., 1980) and public transport in general (Abou-Zeid et al., 2012; Abou-Zeid and Ben-Akiva, 2012; Lai and Chen, 2011) positively affect the overall satisfaction of bus use and public transport use, respectively. According to De Vos et al. (2016) and St-Louis et al. (2014) a positive attitude towards a certain mode has a positive effect on travel satisfaction when using that mode. Manaugh and El-Geneidy (2013) suggest that people who value exercise and who are environmentally aware will be more satisfied with walking trips compared to people who are not. Travel-liking attitudes also have a direct effect on travel satisfaction; people with a positive stance towards travelling in general (e.g., people who value travel time) are mostly more satisfied with trips compared to people who dislike travel (De Vos and Witlox, 2016; Ye and Titheridge, 2017). Travel satisfaction could also influence travel-related attitudes; it is plausible that a satisfying trip with a certain mode will result in a more positive stance towards that specific mode. To the best of our knowledge, only one study up till now has examined this link. De Vos et al. (2017) state that satisfying walking and cycling trips positively affect attitudes towards walking and cycling, respectively. Since travel-related attitudes have an important effect on travel mode choice (see Section 2.4), travel-related attitudes and preferences will also have an important indirect effect on travel satisfaction, through travel mode choice.

2.4 A bidirectional relation between travel satisfaction and the residential location

Previous studies have indicated that travel-related attitudes, the residential location and travel mode choice are related with each other. Both attitudes and the residential location have an important effect on travel mode choice. Numerous studies have indicated that the residential neighbourhood has an important impact on travel mode choice. Walking, cycling and public transport use are significantly higher and car use significantly lower in compact, mixed-use neighbourhoods compared to low-density, single-use neighbourhoods where destinations are mostly not within walking or cycling distance and public transport services are limited (e.g., Cervero and Kockelman, 1997; Ewing

and Cervero, 2001, 2010). The relation between attitudes and mode choice has also been examined frequently. Over the past two decades a numerous amount of studies have indicated that (travel-related) attitudes are important determinants of travel behaviour, and mode choice in particular (e.g., Bagley and Mokhtarian, 2002; Handy et al., 2005; Kitamura et al., 1997; Schwanen and Mokhtarian, 2005). A positive stance towards a certain travel mode will result in a higher probability of using that mode, as long as the use of this mode is not restricted by elements such as the built environment or weather conditions. This is not surprising since – according to the theory of planned behaviour – attitudes are (together with subjective norms and perceived behavioural control) an important variable explaining people’s intention to perform a given behaviour (Ajzen, 1991).

However, travel-related attitudes do not only have a direct effect on travel mode choice; attitudes can also affect mode choice indirectly through the residential location. Although the residential location choice is often based on reasons other than transport, such as dwelling and neighbourhood characteristics (Chatman, 2009; Ettema and Nieuwenhuis, 2017), individuals with an affinity towards a certain travel mode might also have a preference for a residential location facilitating the use of this favoured mode (e.g., Cao et al., 2007; De Vos et al., 2012; Handy et al., 2005; Schwanen and Mokhtarian, 2005; van Wee, 2009). This implies that car-loving people, for instance, will try to select themselves in low-density suburbs which are mostly designed to be well accessible by car. Recent studies also suggest that people choose to live in a neighbourhood which enables them to have satisfying trips (Cao and Ettema, 2014; De Vos and Witlox, 2016). This could be obtained by living in neighbourhoods stimulating the use of a preferred travel mode, but also by living in a neighbourhood that brings along a certain preferred trip length (in time and distance). Therefore, it might be possible that travel-liking attitudes – besides mode-specific attitudes – influence the residential location choice. People who do not like to travel, will probably prefer to live in urban neighbourhoods making it possible to minimise travel, while people with a less negative stance towards travelling might not mind living in a more suburban-type neighbourhood where trips are, on average, longer in time and distance (De Vos and Witlox, 2016).

The fact that people might select themselves in a certain type of neighbourhood enabling them to have satisfying trips also suggests that the residential location has a direct effect on travel satisfaction. If there were no such influence than people preferring a certain way of travel (providing them with high levels of travel satisfaction) would not have a preference for a certain type of neighbourhood. This effect of the residential neighbourhood on travel satisfaction might be explained by variations in elements possibly affecting travel satisfaction (such as congestion, trip duration, and the ease to use certain (preferred) travel modes) which differ according to the type of residential location people live in. Although three recent studies (De Vos et al., 2016; Mokhtarian et al., 2015; Ye and Titheridge, 2017) have started analysing the direct effect of the residential location on travel satisfaction, it remains – up till now – unclear to which extent and in what way the residential location affects travel satisfaction.

Furthermore, it is also possible that satisfaction with daily travel affects the residential location (choice). People who are not satisfied with their daily travel might also not be satisfied with their residential location as their residential neighbourhood – setting the parameters within which many travel choices are made for a considerable amount of time – might force them to travel in an

undesired way.² Car travel in urban areas might be hampered by congestion, car-free zones and limited parking space, while people living in suburban or rural areas might have to travel longer distances than desired, possibly with an undesired mode (i.e., the car). Therefore, low satisfaction with daily travel might result in low residential satisfaction and an increased intention to change the residential location in favour of a neighbourhood enabling people to travel in a desired way (e.g., by driving more with a preferred travel mode). However, it has to be noted that residential satisfaction and the decision whether or not to relocate will be affected by a wide range of elements other than travel satisfaction (such as neighbourhood characteristics and the proximity of family and/or friends).

3. Travel satisfaction: a continuous process

In the previous sections we have shown, albeit somewhat fragmented, how travel satisfaction is related with long-term well-being, travel mode choice, travel-related attitudes and the residential location choice. However, we believe that these elements are all related with each other in a process in which travel satisfaction plays a central role (Figure 3).

Figure 3 shows how satisfaction with a certain trip is affected by long-term well-being (i.e., life satisfaction and eudaimonic well-being), travel-related attitudes, travel mode choice, and the residential location. As indicated before, travel-related attitudes have an impact on travel mode choice, both direct and indirect through the residential location (choice) (i.e., residential self-selection). Although less relevant for this paper, it has to be noted that a direct link from the residential location to long-term well-being is possible. Some studies indicate lower levels of life satisfaction in urban neighbourhoods due to higher densities, while other studies suggest positive effects of urban living on well-being, caused by higher accessibility to destinations and more opportunities for satisfaction of individual's needs (Brereton et al., 2008; Cao, 2016; Schwanen and Wang, 2014).

Satisfaction with frequent trips of the same kind will have an effect on satisfaction with daily travel. For instance, positively perceived commute trips can improve satisfaction with daily commute, just as dissatisfaction with frequent leisure trips might decrease overall satisfaction with leisure travel. It has to be noted that the link between trip satisfaction and satisfaction with daily travel will probably be stronger for commute trips than for leisure trips since commute trips are – compared to leisure trips – mostly more repetitive and more stable in terms of trip characteristics (e.g., travel mode choice, travel distance and travel time). Trip satisfaction (together with long-term well-being) might also affect people's mood during the activity at the destination of the trip. At the same time, this satisfaction with activities at the destination (e.g., leisure activities) might affect satisfaction with that domain (e.g., leisure). Although it is possible that direct links from long-term well-being and travel-related attitudes on satisfaction with daily travel exist, we think this link is mainly indirect through trip satisfaction. We therefore did not include these links in Figure 3.

As indicated in Section 2.1, it is possible that satisfaction with daily travel affects satisfaction with one specific trip. People who are satisfied with their daily commute will probably be more satisfied with a specific commute trip compared to people who are not pleased with their daily travel to work.

² On the other hand, being very satisfied with the residential neighbourhood might be a reason for people to put up with non-satisfying travel patterns.

However, we believe that this link is partly indirect, through long-term well-being, the residential location (choice), travel-related attitudes and travel mode choice.

We feel that satisfaction with daily travel has an important impact on long-term well-being, mode choice, attitudes and the residential location. A low satisfaction with daily travel patterns might result in lower levels of long-term well-being, worsened attitudes towards the way of travelling (e.g., the used mode, trip length), and higher intentions to change the used travel mode and to relocate to another type of residential location. Satisfaction with daily travel might also affect long-term well-being indirectly, through satisfaction with activities performed at the destination. It has to be noted, however, that long-term well-being is not only affected by travel satisfaction, satisfaction with activities enabled by travel and the residential location, but by a wide range of elements including personality/genetics, health status, income level and social relationships (e.g., Diener et al., 1999; Lyubomirsky et al., 2005b). The relations from satisfaction with daily travel to (i) travel mode choice and (ii) the residential location might also be indirect, through travel-related attitudes. It is plausible that multiple satisfying trips with a certain mode improve the attitude towards that mode, thereby increasing the likelihood that this mode is also used for a future trip of the same kind (De Vos et al., 2017). At the same time, it is possible that travel satisfaction can affect the preference to reside in a certain residential neighbourhood indirect, through mode-specific and/or travel-liking attitudes. Dissatisfaction with car use or long travel times and distances, for instance, might deteriorate people’s attitudes towards car use and travel in general. As a result, these persons might create a preference for residing in urban-type neighbourhoods, where alternatives for the car are mostly present and average trip distances and times are lower.

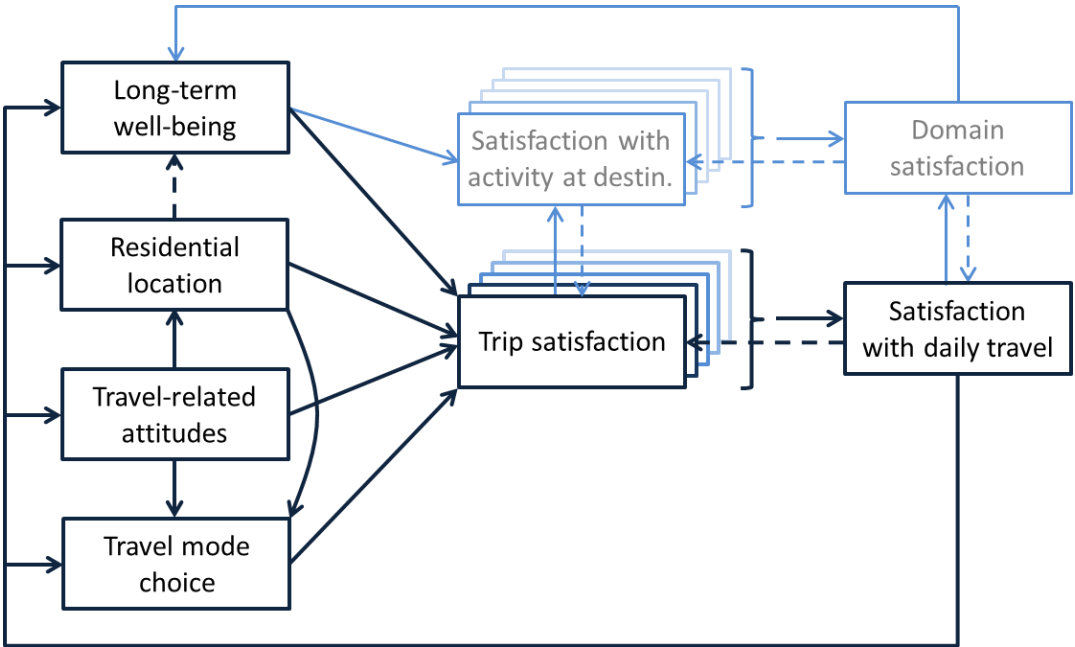


Figure 3: the pivotal role of travel satisfaction in a travel behaviour process.

The above mentioned process is a continuous process. The perception of every trip made will slightly affect satisfaction with daily travel which in turn will affect long-term well-being, residential location (choice), travel attitudes and travel mode choice; four important elements which will play a role in

the perception of a future trip. The process shown in Figure 3 is therefore not an isolated process, but a process being repeated every time a trip is made.

The process shown in Figure 3 also reveals some additional, indirect relationships. Although some studies suggest that attitudes and behaviour are mutually dependent on each other and that attitudes both affect, and are affected by, choices (Dobson et al., 1978; Golob, 2001; Kroesen et al., 2017; Tardiff, 1977) – possibly resulting in a link from mode choice to travel-related attitudes – we think that this link is mainly indirect through travel satisfaction. Repetitive positively or negatively perceived trips with a certain mode can influence satisfaction with daily travel which in turn can affect a person's stance towards the used mode. Furthermore, it is also possible that the built environment affects travel-related attitudes in an indirect way. Although a direct link from the residential location on attitudes has been suggested in previous studies (e.g., Kitamura et al., 1997), we feel that this relationship is mainly indirect, through travel satisfaction. Using a certain mode in a residential neighbourhood stimulating the use of that mode (e.g., using public transport in an urban neighbourhood with good public transport facilities) might result in high levels of travel satisfaction when using that mode, possibly improving attitudes towards that mode.

4. Travel satisfaction: a missing link in the formation of travel habits?

The process described above and shown in Figure 3 may play a crucial role in possible habit formation. Travel mode choice is mostly a repetitive type of behaviour, especially for commute trips whereby people mostly travel to the same destination every day. If people choose the same mode over and over again it is possible that behaviour has become habitual and that people choose a certain mode – that satisfied their needs in previous trips – without a deliberate decision process (e.g., a decision based on attitudes and intentions) (Aarts et al., 1998; Verplanken et al., 1997). However, always choosing the same travel mode for a certain type of trip may not always be the result of habits, but can be the outcome of repeated decision making processes. According to Triandis (1977), the relationship between habits and deliberate choice making (based on intentions) is reciprocal: the stronger the determinant habit is, the weaker the determinant intention is, and vice versa. As a result, the role of attitudes in our proposed process (Figure 3) will depend on how habitual the mode choice decisions are. In case travel mode choice is a deliberate choice, attitudes play an important role in the process between attitudes, mode choice, residential location and travel satisfaction. In case mode choice has become habitual, the role of attitudes in this process becomes limited and people will most likely repeat past satisfying behaviour.

The process described in Figure 3 suggests that travel satisfaction can play an important role in a modal shift (away from car use). In case of intermediate or high levels of satisfaction with daily travel, people will most likely not look for alternative travel modes. However, in case of low satisfaction levels, people might be inclined to change their travel mode, either directly – by choosing an alternative mode which might satisfy their needs more – or indirectly through changing travel-related attitudes. This indirect effect through attitudes will mainly be present in case of deliberate choice making and only to a limited extent in case choices are habitual. However, frequently performed behaviour in stable contexts is unlikely to be spontaneously reconsidered and changed as the cost of searching for and constructing new alternatives is generally high and the expected benefits associated with new alternatives uncertain (Ajzen, 1991; Dahlstrand and Biel, 1997; Gärling and Axhausen, 2003). Therefore, it might be necessary to disrupt certain (travel-related) contexts in

order to unfreeze undesired habits (e.g., repetitive car use). Such a context change has the potential to make behaviour-relevant information more salient and influential, which may lead to new choices and decisions (Verplanken et al., 2008). A disruption of a stable context could be realised by measures such as temporary changes in the road network (e.g., Fujii et al., 2001), and providing habitual car drivers with a free bus ticket for a certain period of time (Abou-Zeid et al., 2012; Fujii and Kitamura, 2003). Although these temporary measures result in a significant reduction in car use during the treatment period, most people return to car use after going back to the original state. Therefore, we think a permanent context change is a better way to reduce car use and to create desirable travel habits and loyalty to active travel and public transport.

A long-term context change affecting people's travel behaviour, and travel mode choice in particular, is a residential location choice. People moving to another type of neighbourhood might be confronted with new travel options and travel restrictions, providing a new window in which behaviour may have a higher likelihood to be (re)considered (Verplanken et al., 2008). For instance, a person moving from a suburban-type of neighbourhood to an urban-type of neighbourhood might reconsider his/her travel mode choice based on the new context. The mode choice will probably become more deliberate and will be based on travel-related attitudes, together with options offered (e.g., public transport facilities, activities within walking and/or cycling distance) and constraints imposed (e.g., congestion, car-free zones, parking problems) by the physical characteristics of the urban neighbourhood. The new built environment will therefore stimulate active travel and public transport use of new residents. In case the use of these modes in an urban environment is perceived positively, desired repetitive use of these modes might be developed by the creation of habits, or by improved attitudes towards walking, cycling or public transport. Therefore, it is important for policy makers to create elements enhancing travel satisfaction of active travellers and public transport users in urban areas, such as wide, well-lit sidewalks, separated bus and cycle lanes, and car-free zones. These elements might improve residential satisfaction of urban dwellers, possibly making urban areas more attractive to reside in compared to suburban or rural neighbourhoods. This might trigger a relocation of non-urbanites to urban neighbourhoods and might consequently result in lower car use.

To conclude, this conceptual paper has exposed a wide range of (possible) relationships between travel satisfaction and well-being, mode choice, attitudes and the residential location. Although some of these relationships have already been analysed to a certain extent in previous studies, a lot of them are underexplored or not explored at all. Furthermore, this paper proposes a continuous process in which travel satisfaction plays an important role between well-being, mode choice, attitudes and the residential location. This process could provide valuable insights into the creation of travel habits and loyalty towards the use of certain modes. It goes without saying that there is ample room for further research based on the proposed links and process explored in this paper. Since previous studies on travel satisfaction have mainly focussed on the effect of travel-related elements (e.g., mode choice and attitudes) on trip satisfaction, future studies should consequently emphasise on (i) how satisfaction with multiple trips (of the same kind) affect satisfaction with daily travel, (ii) to which extent satisfaction with daily travel influences long-term well-being and preferences/choices of where to live and which travel mode to use, and (iii) to which extent and how long satisfaction with trips can affect the performance of activities at the destination. In this regard, using qualitative methods (i.e., conducting in-depth interviews) and longitudinal data (i.e., repeated

observations of the same variables over a certain period of time) could be helpful in gathering valuable insights in to how elements included in our proposed process evolve over time due to repeated positively or negatively perceived trips. Alternatively, quasi-longitudinal studies, retrospectively asking respondents to report changes in their travel-related satisfaction, behaviour and preferences could be applied, possibly of recently moved residents (e.g., Cao and Ermagun, 2017). This would make it possible to analyse the importance of satisfaction with daily travel and travel-related attitudes/preferences on the choice to relocate and the choice of where to relocate. Repetitive real-time measures of people's experienced emotions before, during (in case of public transport use and walking) and after a trip – i.e. during the activity at the destination – might provide researchers with detailed information on how emotions developed during a trip flatten out afterwards. Smartphone surveys, for instance, could be a useful tool to gather this real-time information (see, for instance, Friman et al., 2017). If the process described in this paper is found to be accurate, this might have important impacts for policy makers. In order to create a mode shift away from (habitual) car use – direct or indirect through changes in attitudes or the residential location – policy makers should focus more on improving travel satisfaction of active travellers and public transport users, especially in urban areas.

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