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Car Use: Intentional, Habitual, or Both? Insights from Anscombe and the Mobility Biography Literature

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Abstract: Policy-makers have recognized that changing travel behavior is important. People, however, do not change their behavior so readily, particularly the use of the car. A central concept that has been invoked to account for this has been the concept of habit. However, various studies also present people as having concrete reasons for driving: Their choices are intentional. This interdisciplinary study attempts to reconcile these two understandings of travel behavior by drawing on insights from the philosopher Anscombe and a growing body of travel research termed the *mobility biography* literature. It applies some of Anscombe's insights from *Intention* to the act of driving. With regard to the mobility biography literature, it draws out conceptual implications both from theoretical and empirical aspects: In particular, the characterization of travel decisions as nested in a hierarchy of life decisions and the association of life events with changes in travel decisions. It concludes that a broader conceptualization of human behavior leads to a broader view as to what policy-makers can do. It reminds us that transport is 'special', that transport and policy are inextricable, and that the importance of infrastructure provision should not be ignored.

Keywords: intention; habit; interdisciplinary; Anscombe; mobility biography; analytic philosophy; transport; automobile; travel behavior; infrastructure

1. Introduction

Transportation makes up a significant share of total energy consumption and greenhouse-gas emissions, and is dominated by the use of the private motor car [1]. Significant attempts have been made to reduce private car use, but usage remains significant, though in some parts of the world it is becoming less so. In other words, it has been acknowledged that it is apparently very difficult to change people's travel behavior or choices. Various concepts have been deployed to account for this perceived difficulty. One is that of 'lock-in', with a related notion of 'path-dependence'. The idea is that transport is indeed 'special', uniquely involving as it does the investment of costly, systematic and, crucially, sunk infrastructure. Once installed, this transport (and also land use) cannot be easily reversed, if it can be reversed at all [2]. Related to this is the notion of 'car-dependence': Once a society has been configured for the convenience of private motorists, conducting one's life without using a car becomes more or less impracticable; one then comes to 'depend' on a car [2].

What these concepts have in common is that they explain resistance to change (or inertia) by primary reference to the external environment a person might find themselves situated in: That within which they might try to meet their needs. Another perspective, however, focusses on the mental, cognitive, or psychological phenomena that occur; these being internal to a person rather than external to them, as with the built environment and infrastructure. Scholars adopting such a perspective, recognizing that travel behavior could be properly described as a form of repetitive, routinized activity, have invoked the concept of habit to explain why people resist changing their

behavior. Roughly, as people repeat a particular type of behavior or action over time, it becomes ‘script-based’ [3] and automatized—an unthinking response to a given cue. Once this has happened, actions are characterized as being undeliberative, unconscious, and akin to an impulse, though scholars are careful not to identify habitual responses as exactly identical to impulses [4].

Such a perspective seems to be in accord with our lived experiences: Not only with regard to driving, but other, routinised behaviors such as cleaning, exercise, and eating. However, it would seem to be at odds with a body of scholarly literature which makes clear that people have *reasons* for driving or using a car. Choice theory, for example, posits the individual as a utility-maximizing agent [5]; qualitative approaches make clear that drivers not only have reasons for driving, but are clearly aware of their reasons for choosing the car [6].

A tension between these psychological perspectives is clearly evident. This article will pose the research question: Is car travel behavior, as a subset of wider travel behavior and of human behavior in general, intentional, habitual, or both? It will aim to answer this question using an interdisciplinary approach, discussing insights from the monograph *Intention* of the philosopher Elizabeth Anscombe, as well as a body of research which has come to be termed as, among other things, the mobility biography literature. The concept of interdisciplinarity has been difficult to define in an easy and straightforward way [7], and in the case of this study it cannot be defined simply and merely as using two or more disciplines in a common intellectual endeavor. This is because the mobility biography literature cannot be strictly described as fitting into a discipline as such: More appropriate seems the broader notion of a field of research—or, as used elsewhere, a research ‘approach’ [8]. Huutoniemi and colleagues have devised a helpful typology of forms of interdisciplinarity; for present purposes, their category of theoretical interdisciplinarity appears to most appropriately describe the form of interdisciplinarity in this paper [9]. It is defined as “synthesizing or contrasting concepts, models, or theories from more than one field in order to develop new theoretical tools for interdisciplinary analysis. The function of integration is to create generic links between fields, inhabit a new territory of knowledge, or establish a new paradigm of inquiry.” (p. 84)

This article will be structured as follows: In Section 2, it will present the literature comprising the predominant socio-psychological theoretical paradigms used to understand car use and transport behavior, and a range of studies which apply their perspectives; it will also elucidate counter-perspectives. Section 3 will present the philosophy of Anscombe in *Intention* with a prelude on the philosopher Wittgenstein, who greatly influenced her approach to philosophy. Section 4 will draw out relevant insights from the mobility biography literature. Section 5 will reflect on aspects of the interdisciplinary approach. Section 6 discusses the implications of this paper’s insights and concludes with some comments for policy-makers.

2. Literature Review: Intentional and Habitual Decision-Making

2.1. *Intentional and Habitual Decision-Making in Transport and Car Travel Behaviour*

The question about the positions that the concepts of intention and habit occupy in the domain of human behavior—and, indeed, of what they even mean—has occupied scholars and researchers from a huge range of disciplines, including philosophy, psychology, and neuroscience [10–13]. In the field of transportation research, two perspectives have tended to predominate, informed by two tremendously influential theoretical frameworks from social psychology: The Theory of Planned Behavior (TPB) and the Theory of Interpersonal Behavior (TIB).

The Theory of Planned Behavior (TPB; [14]) was originally developed as the Theory of Reasoned Action [15,16], and has a strongly rationalist conception of human behavior. It coheres with theoretical frameworks both from economics and (neuro)psychology. It does so with regard to economics—and particularly expected utility models—in taking it as axiomatic that people, when faced with a range of alternatives, select one with the best behavioral consequences. People choose the best available option; they maximize (expected) utility [5]. Such an exposition does not as such provide a psychological

description of how people make decisions; one of the TPB's key principles, however, does: Which is that the immediately prior and determinative antecedent of any action is an intention, as is also argued to be the case in psychology and neuroscience [17]. An intention is influenced by three factors: Beliefs about the consequences of their actions, normative beliefs—normative expectations of important reference groups or people, and beliefs about how much control they have over their action—the efficacy with which they can translate action into results. In the specific case of transport, it would be postulated that people deliberatively weigh up the advantages and disadvantages of each of their travel choices, and form a conscious intention to choose the one they decide to be the best—which, for the most part, turns out to be the car. It is hard to switch people away from the car because of its intrinsic advantage relative to people's deliberative calculus.

The Theory of Interpersonal Behavior (TIB) was introduced by Triandis [18]. It has a very similar conceptual structure to the TPB; but it has two significant augmentations. Firstly, it introduces the following constructs as additional determinants of behavioral intention: Roles (hence, 'interpersonal'), self-concept, and emotions. Secondly, a dynamic or temporal dimension. It agrees with the TPB that intention precedes action, but only in situations that are new or unfamiliar. It diverges in positing that, if the setting in which decisions are made remains stable over time, an association between goals and behaviors is reinforced so that, eventually, the behavior becomes an automated response. On this understanding, habits can be defined as: "goal-directed behavioural patterns which have become sufficiently associated with specific cues as to be initiated automatically" [19] (p. 69). This does not however mean that habitual action is reduced to the level of an impulsive reaction or a mere automatic reflex; it is distinguished by virtue of its being undertaken to fulfil a goal (goal-directedness). Thus, people initially make conscious, intentional choices to use the car against its alternatives, and as they repeat using the car over time their choices cease to be intentional and become habitual. Changing car user behavior then becomes hard because of the strength of the association between the 'cue' and the automatic response.

Both the TPB and the TIB have been put forward as general theories of social behavior [20]. This, allied to their parsimonious specifications which lend them directly to quantitative modelling techniques with relatively large sample sizes, in particular the structural equation modelling (SEM) technique, have led them to be applied to a very wide range of domains, of which transport is only one [5,20–25]. As applied to the particular case of car use, they have been used for various purposes. Studies which make use of 'pure' TPB models (omitting habit, and presuming that only intention is to be spoken of) examine which of the TPB constructs are most significant in influencing people's car use decisions; they also attempt to test the statistical 'fit' of the TPB to evaluate its overall explanatory effectiveness [26–29]. 'Habit-based' studies might not exactly adopt the formal structure of the TIB, but in any case also examine how important the concept of habit is in explaining and predicting car use [3,4,30–36]; some studies have augmented the TPB to include habit as a predictive construct [37]. A very small number of studies have directly compared the TIB and TPB [20,38], or, at least, theoretical models with different specifications, some with habit and some without [39], and have attempted to find which framework is better at explaining behavior, again based on statistical fit. One found that the set of constructs contained in a standalone TPB was better than habit as a variable in predicting the mode of travel that people might choose [38]. Elsewhere, Gardner and Abraham [40] conducted a meta-analysis of a wide range of psychological correlates of car use, and found that while variables from the TPB had predictive utility, habit also strongly affected behavior.

From such studies, policy recommendations to reduce car use and thereby improve the environmental sustainability of people's travel behavior have tended to have a psychological rooting. If the TPB's account is accepted, changing people's behaviors requires changing the determinants of their behaviors: Namely, attitudes, subjective norms, or perceptions of behavioral control [41]. In the case of the car, that might involve policy measures to alter its attractiveness relative to other modes (e.g., increasing taxes on the car or subsidizing other sources of transport) or by persuading people to change their values, by the use of public information campaigns [42,43]. All of those would be

ultimately done with a view to “influenc[ing] the individual’s deliberate travel mode choice” [44] (p. 11). If the habit-based account of the TIB is accepted, on the other hand, then to change people’s behaviors one must not attempt to change people’s consciously chosen actions: One needs to break their habits. This can take place in a variety of ways. One perspective is that, given that habits are argued to be stable relative to a given context or environment, one ought to break the habit by changing the setting in which it is repeated. This could be done by, for example, introducing economic incentives such as pre-paid bus tickets [45]. Another suggestion has been to induce a deliberate process prior to behavior, such as making people deliberate upon various features of their trips, such as its duration, the amount of luggage to be carried, and the weather conditions that are likely to be experienced over its course [33,46].

2.2. Alternative Perspectives on Habitual Behaviour

The widespread proliferation of both the TPB and the TIB appears unsurprising. Both appear to capture apparently fundamental insights that seem unarguable and certainly strongly relevant to the case of transport choices. Transportation choices involve costs that are significant and would surely involve some sort of deliberation. Yet it would seem equally true that real-world choices do not involve deliberation at each and every turn.

The predominance of these theories has prompted critiques and counter-critiques, both from within the theoretical background and outside it [47,48]. Consequently, other scholars have sought to suggest alternative perspectives on travel behavior. In particular, social practice theory has argued that excessively privileging cognitive phenomena misses things out: Rather than having the deliberating, rational individual as the focus for any inquiry into social phenomena, it would be better to use that of a ‘practice’ and its elements [49,50]. One of its key proponents, Shove, has been critical of what she has termed the ‘ABC’ paradigm (attitude, behavior, and choice) for understanding and affecting environmentally-affecting behaviors, of which using the car less is certainly a part [49]. She traces the ABC paradigm directly to ‘theories of planned behavior’, which of course includes the TPB, as well as the TIB which built further upon it. It makes individual behavioral choice the central focus of policy and implies that “the conceptual and practical task of [effective policy] is to identify and affect the determinants of pro-environmental behaviour” (p. 1275). Amongst her criticisms, she says that such a paradigm creates blind spots in identifying possible changes in practices and sustains certain forms of governance that may make changes more difficult [49]. Elsewhere, in a study also relevant to low-carbon mobility, Schwanen, Banister [12] also argue that existing conceptions of habit tend to neglect the role of active agency, and argue that to understand habit one must go beyond a simple ‘Cartesian’ conception of the contemplative individual.

This research article aims to contribute to this debate, and seeks to shed light on conceptual issues surrounding the notions of intention and habit. It will next go on to discuss the work *Intention* of Anscombe, as well as a body of research in the transport literature which comes under the term ‘mobility biography’.

3. Anscombe’s Intention

Elizabeth Anscombe’s monograph *Intention* is arguably one of the most significant philosophical works of the twentieth century, so much so that philosopher Donald Davidson termed it “the most influential account of action since Aristotle.” It can be said to have effectively launched the field of the philosophy of action. Since Anscombe’s *Intention*, alternative accounts of the concept of intention have been proposed, not only including by Davidson, but also Bratman [51]. Other accounts, not only from philosophy, but other fields like psychology and neuroscience, offer views that are congruent with those offered by the TPB and TIB, in positing that intentions are essentially to be understood by reference to mental or psychological processes or events. Within philosophy, ‘causalist’ views would hold that intentions are among a number of mental items that cause actions [52,53]. Elsewhere, Marcel notes that within psychology, there is an assumption that intentions are, by nature, conscious

things [17,54]. For example, Wegner, while denying that intentions cause actions as such, holds that intentions are ideas which feature in people's consciousness right before they do what they intend [55]. Going even further, neuroscientists aim to physically pinpoint intentions to specific places in the body's nervous system. One study identified that "functional imaging studies of intentional actions typically show activation in the basal ganglia and supplementary motor area" [56] (p. 190); another, that intentions "are initially encoded in at least some of the cortical areas within the PPC [posterior parietal cortex]" [57] (p. 695–696) (both as quoted by Mele [17]). As will be seen, such newer views are at odds with Anscombe's; nonetheless, interest has increasingly returned to her work, with new scholarly attention and publications perhaps reflecting the work's enduring insights.

Before examining Anscombe's arguments in *Intention*, it will be helpful to discuss another philosopher who had a profound influence on her: Wittgenstein. This is because Anscombe's book is perplexing and challenging, both in its style and organization. Based on a series of lectures, *Intention* does not follow a clear, linear path: It begins with a short investigation of the concept of 'intention' as such, and then, finding that fruitless, focuses on the concept of 'intentional action', reaching its central and defining sentence, its definition of intentional actions: "the actions to which a certain sense of the question 'Why?' is given application; the sense is of course that in which the answer, if positive, gives a reason for acting." Teichman admits that this seems quite arbitrary: No justification is given for this definition, no background explanation is given as to how she has reached this formulation, and Anscombe says that her answer is merely suggested, rather than asserted [58].

Wittgenstein is fruitful here for two reasons; content and style. As regards the first, Wittgenstein's seminal *Philosophical Investigations (PI)* [59] contain aphoristic comments relating to intention that, despite their cursory nature, began a huge amount of research on intentionality, indeed inspiring such philosophers and scholars as Anscombe [60]. One of his points, relevant to the philosophy of psychology, was that when we speak of someone intending or meaning something, we do not so by reference to any thought-processes or 'ostensive' acts (mentally directing one's attention to a given thing). Intentional verbs thus "do not signify phenomena." [61]. This is firstly because intentional verbs do not have 'genuine duration': They:

- "Cannot take a course, unfolding in different ways.
- Cannot be spot-checked or observed continuously.
- Cannot be clocked by a spot-watch.
- [Are] neither interrupted by a break of consciousness or a shift of attention, [nor] endure continuously" [61].

Secondly and more fundamentally, because mental or physical processes or states "are neither necessary nor sufficient for believing, intending, or meaning something." [61] It may well be allowed that there are empirical correlations between such phenomena and intentional attitudes that might inform psychologists about 'subconscious' or 'unconscious' intentions. However, as far as the concept of intention is concerned, they do not "determine the content of intentional attitudes: what someone intends or means." As Hacker [60] argues: "just as willing is not a mental act or event that precedes acting voluntarily, so too intending is not an antecedent mental act or experience (feeling, thought, or sensation) that precedes acting intentionally." Likewise, he argues that intention is not:

- A sensation or feeling,
- A mental act or activity engaged in,
- Thinking,
- An experience,
- An accompaniment of action.

It is simply that there is a category difference between mental phenomena and intentional attitudes as concepts. What this means is that if the essential feature of intention is no longer held to be an 'intentional thought', and that of habit is held to be its absence, the putative dichotomy between

intention and habit breaks down altogether. Stating that an action has been performed out of habit, or as a matter of habit, does not license one to rule out that it was performed intentionally.

The second point relates to style. As earlier noted, *Intention* has been acknowledged as a difficult read: It is hard to make sense of what Anscombe is trying to do and how she justifies herself. However, when one considers Wittgenstein's approach to philosophy, this is made easier. Ultimately, being a philosopher, Wittgenstein's concern—and, indeed, Anscombe's—is all about concepts. Rather than propounding a particular philosophical theory, however, Wittgenstein is distinguished by his particular methodological approach, the influence on Anscombe of which is clearly evident. Some elements of this style can be described as follows. Concepts are not prior to language; language is prior to concepts; a language is presupposed by the very existence of concepts; concepts are only possible within language. Concepts, moreover, are tools, linguistic tools: Their meaning is in their use as tools within language. The concepts that we use are concepts in our language, and our language just so happens to be full of irregularities, quirks, and nuances. Any philosophical investigation into the meaning or sense of a particular concept must therefore describe how it is used in language. The following quote from *PI* (109) describes well Wittgenstein's approach to philosophy: "And we may not advance any kind of theory. There must not be anything hypothetical in our considerations. We must do away with all explanation, and description alone must take its place" Wittgenstein's approach in *PI* is therefore to gain a surview or overview (Übersicht) by looking at a concept from different perspectives [62], travelling 'over a wide field of thought, criss-cross in every direction' (*PI*, preface). Anscombe in *Intention* also adopts this circumnavigatory aspect, but rather than taking snapshots of a landscape from various angles, her approach seems more akin to tracing—defining, even—the borders of a particular territory. Thus, in *Intention*, she could be said to be, painstakingly, navigating the scope or domain of the concept of intention, with all its irregularities, singular qualifications, awkward exceptions, and particular cases. She makes use of discrete examples case-by-case, and the appeal to 'wider circumstances' in clarifying the sense of an expression. She is also happy to make rough generalizations and to acknowledge grey areas of language, a language which, as Wittgenstein noted in his earlier *Tractatus Logico-Philosophicus*, has its 'enormously complicated tacit conventions'. However, while Wittgenstein's account is aphoristic and for the most part negative, saying what we can't say about intention, Anscombe's is positive, saying what we can. Anscombe also uses Aristotelian conceptual architecture to buttress the notion of intentionality she propounds—a highly un-Wittgensteinian move. Stoutland [63] summarizes as follows: "it is fair to say that Anscombe read Wittgenstein in the light of Aristotle, and Aristotle in the light of Wittgenstein—and then went her own way."

One now returns to Anscombe's formulation of intentional actions as "the actions to which a certain sense of the question 'Why?' is given application; the sense is of course that in which the answer, if positive, gives a reason for acting." If this account of intentionality is accepted, then it becomes clear that any cognitive, mental, deliberative mental processes instantaneously prior to an act do not actually figure in intentional action. Therefore, intentionality cannot be denied to an action performed habitually, one without a rational deliberation preceding it. Even if someone is performing an action out of habit, not directly paying attention to what they are doing or even performing it on auto-pilot, as long as one can subsequently ask them 'Why?' and they then give their reason for having acted, their action would count as having been intentional. This would certainly seem to apply to the case of driving the car, as observed by Gardner and Abraham [6]. In fact, Anscombe later on points out that answers to 'Why?' need not be specific reasons for their corresponding actions to count as intentional: "I don't know" and "No particular reason" can, in some cases, be perfectly valid answers. With reference to the earlier discussion about the TIB, actions don't have to be goal-directed to be differentiated from mere impulses or reflexes (someone can 'automatically' gaze out of the window without a particular reason and later offer "No reason, really" as a perfectly legitimate avowal of intentionality). Thus, intentionality and habituality (understood here in the sense of an unthinking, repetitive, triggered response in a stable decision setting) are not antitypical to each other; this is

because they do not sit on the same conceptual plane. In fact, far from being antitypical to each other, they may, as far as the case of travelling by car is concerned, run in the same direction. Unreflective habituality may in fact be the natural accompaniment of settled intentionality.

In addition, Anscombe, like Wittgenstein, argues that the mere presence of an antecedent mental event, thought, or process is not a criterion for intention, although her argument is more general and applies to any criterion that only concerns itself with what happens at or before the intentional action takes place. Her arguments are different, however. One point is that intentionality is not about a particular feature that accompanies an action which thereby distinguishes intentional actions from non-intentional actions by their absence, in the way that two mechanically identical cars would be distinguished by the stamp of their marques, or two switches distinguished by being on or off (i.e., the quality of ‘intentionalness’). Her critical point is that intentionality is a form of description, and that actions can be intentional under some descriptions and not intentional under others. For example, John might board a train (intentional action); this might also be describable as an unintentional action (John boarded the wrong train), an involuntary action (John’s left leg twitched while he boarded the train), and even under a non-intentional form of description (John’s leg muscles moved in accordance with certain electrical impulses). The point with this is that intentionality is not an ‘objective’ or ‘discoverable’ feature of an action as such: It is rather how we characterize a situation depending on what our point of interest is of it. If we accept this, then her argument is that it could not be some feature is as follows. If it were some feature (for example, a spasm or some electrical activity), nothing about that feature could determine the content of the particular description of the intentional action. It would just be by happy accident, which would be unsatisfactory: Surely we would not only want there to be a relationship, but an *effect*. Her point seems to be that ‘discoverable features’ and ‘forms of description’ are in different conceptual categories, and there is no obvious way to make an explanatorily meaningful or significant connection between them. Another way she tries to rule out the idea that we can determine the content of an intentional action merely by referring to some feature that ‘stamps it’ when it is taking place is to argue that, for intentionality to be meaningful, it must in some way refer to the possibility of future action. That is, it cannot be something that can exclusively be given content by reference to the present. One point she makes is that if we commit ourselves to saying that what ‘stamps’ the action with the mark of intention is something that can only be found by reference to the present (or the ‘proceedings-in-a-given’ description), then it would be impossible for anyone who was clearly seen to say that they did not know what they were doing, without lying. If it were not a ‘stamp’ or a ‘style’, but still was some feature of the action done at the time it was done, and therefore without any relevance to anything taking place in the future, then we would end up with a very thin and etiolated concept of intentionality: It would mean that, for example, there would be no point in criticizing people for their motives.

Anscombe’s insight that an action can come under various descriptions has further relevance. She gives the famous example of someone pumping poison in a well in order to kill some people. This action can come under four descriptions: Pumping one’s arm up and down (A), operating the pump (B), replenishing the water supply (C), and poisoning the people (D). All of these actions could be said to be intentional: Yet the question arises as to which is the intention *with which* all these actions are performed? Anscombe’s answer would be that it is D: The intention to poison the people; this, she says, “swallows up” all the other intentions. The relevance of this to the case of driving would seem to be as follows. When someone drives—say—drives to work, what they are doing can also be said to come under various descriptions. They are physically operating the car (manipulating all of its physical functions), they are actually driving the car, or they are, more broadly speaking, going to work. So-called ‘activity models’ do in fact simulate and predict people’s travel patterns by making the work or activity the basic function that people try to meet, and they schedule their trips and vehicles, etc. based on this [64–66]. Such a view of car use and travel in general as purely being a ‘derived demand’ undoubtedly would fail to do justice to the complexity of real-life, because people do have strong attachments to cars in their own right and may enjoy travelling in its own right [67]. Nonetheless, if

the ‘derived demand’ case is considered, we might think that not all ‘intermediate’ descriptions of the action need involve some process of deliberation [67]. Consider the use of tools (toothbrushes) or obviously utilitarian vehicles like tractors and forklifts, which are no more than an intermediate means to the broader goal. Thus, it might be perfectly reasonable not to expect the actor to have a particular ‘intentional thought’ for, at the very least, intermediate descriptions of the action (i.e., “I intend to change gear”, “I intend to use my car today”, etc.).

What sense, then, can be made of the notion of actions that are both intentional yet performed out of habit? Anscombe’s response would be that ‘the question does not normally arise whether a man’s proceedings are intentional’—which is why it is frequently ‘odd’ to call them that. For example, we would not usually say of someone that they crossed the road intentionally; yet this doesn’t mean that this would not be an acceptable example of intentional action. Indeed, when we ask someone whether they did something intentionally, it is usually because, for example, there is some doubt as to whether they knew what they were doing. The default is that people act intentionally, or, as Anscombe says: “Roughly speaking, a man intends to do what he does. But of course that is *very* roughly speaking” (Section 25).

4. The Mobility Biography Literature

The second disciplinary approach through which the concepts of intentional and habitual travel behavior will be considered is the mobility biography literature [68,69]. More properly considered a methodological approach than a theoretical framework, it is related to the broader ‘life course perspective’ in which “any point in the life span must be viewed dynamically as the consequence of past experience and future expectation as well as the integration of individual motive with external constraint.” [70] (p. 12). Central to any study of travel behavior with such an approach is the consideration of peoples’ life courses in their entireties.

The earliest contribution particular to transport was by Salomon and Ben-Akiva [71], who developed much of the conceptual elements and applied them to quantitative data. They deployed the notion of a ‘life-style’, defined as “a pattern of behavior under constrained resources which conforms to the orientations” (p. 623). According to their conceptual framework, the decisions households made in their lives were structured hierarchically, coming into the following three categories: Life-style choices, mobility choices, and activity and travel choices. Life-style choices were in the supreme category, sitting at the very top of the hierarchy, and were related to such questions as to family formation, participation in the labor force, and orientations towards leisure. Below this, mobility choices were concerned with the choice of where to work and live and whether or not to own a car. At the bottom of the hierarchy were day-to-day activity and travel choices, such as the decision to walk or drive to work. Choices in each category are assumed to be made jointly with each other, and are conditional or determined by those higher in the hierarchy, although Scheiner [72] argues that lower-category decisions could in theory take priority over higher-category ones (for example, people with cars have more options of where to live, and long-distance commutes are serious burdens on households; long-distance commuters tend to change where they live or work more) and that the assumed direction of determination might depend on what one is trying to explain.

More recent contributions to the literature have offered a more flexible and fluid approach to studying people’s lives. They tend to be interested in the longitudinal, dynamic, drawn-out process of life and its changes, rather than the impacts caused by, and the relationships between, life events in discrete categories. Sattlegger and Rau [73] distinguish between ‘first wave’ studies, which take a ‘linear-realist’ conception of life and focus on how singular events lead to behavioral changes that people can access from memory [74–76]; and ‘second wave’ studies, which use more narrative-inductive approaches and acknowledge that ‘mobility practices and their complex and interrelated changes over lifetime’. Some outright reject the idea that these categories or domains in life are hierarchically related to each other [8], implying that general values and imaginaries of the good life—expressions of top-level ‘life-style’ aspirations—need not always change for mobility decisions to be altered. Others

recognize how they are complex and interrelated, how clear-cut chains of decision-making may not always manifest themselves in practice, “and that slower, long-term processes of change . . . may have onsets cannot be easily pinned to a specific event or occasion” [73] (p. 23).

For the most part, this paper uses Salomon and Ben Akiva’s framework, though principles and insights from the mobility biography literature considered more broadly may certainly have application. In any case, without touching directly on intention and habit themselves, it becomes clearer that their framework implies a rather different and more complex picture of intention, deliberation and action than the linear TPB and TIB models. Instead of the solitary, discrete, standalone, and determinate travel choice made in isolation, people could in some sense be said to be making choices between configurations of life styles which might have some indeterminate outcomes. Thus, it is not as such a question of mode choice on an individual basis; it could be, for example, between Job A, House X, and a seasonal railway ticket, and between Job B, House Y, and a car. Indeed, even travel decisions are not to be considered in isolation of each other: In particular, the adoption decision and the daily usage decision may affect each other (people’s choice of car may depend on their current travel mileage, and how their mileage changes in the future may depend on the car they eventually choose to get), reflected in travel forecasting studies which use simultaneous equation modelling techniques [77,78]. People do not, as such, make travel choices standalone: These choices are conditional on actually having adopted a car (or having purchased a travel card) in the first place—rather related to the notion of path dependence, where an initial commitment may condition subsequent choices [2]. Another point to make is that of a very different relation between intentional thought, and deliberation, and action. It is probably reasonable to surmise that people do not necessarily have clear intentions of what sort of life styles they want; indeed, of what jobs they want and how they will then make their travel choices. They may take much time deliberating over what they really want before taking action.

As regards its methodological rootedness in the person’s entire life course, it implies that we should expect travel behavior to be in some sense habitual anyway; some scholars in this field of research have explicitly agreed that travel behavior best comes under that description [69]. The nature of life and its rhythms: Daily life, quotidian life—should be expected to be routine. Insofar as transport decisions are considered to be a subset of life decisions and are to be made in conformity to its dictates, we should indeed expect them to exhibit the very regularity and routineness we would find in the rhythms of life [79]. Psychological processes and deliberation are not actually that central, and should not be expected to be that central, to the question of day-to-day car usage as such.

Another implication which seems to emerge and which mirrors something previously discussed is that travel is for the most part a derived demand, being dependent on the higher-order life decisions. In short, transport is a means to other ends. It then could be said to make it reasonable to call travel behavior both intentional and habitual in a similar way to Anscombe, just in a way that is explicitly applied to transport. In one sense, yes, they did drive to work, but the relevant choice might have been for the place of work. Taking the chain of ‘Why?’ questions even further, as with Anscombe, one might find answers such as: ‘To support my family’/‘It was just the job I needed’ etc., with the car use being merely a resultant given.

Another insight that appears to emerge from this framework is that a household can be in a position where they appear constrained, ‘locked-in’, and do not have any reasonable transport alternatives to the car, but that this is because of rational choices and, indeed, voluntary commitments, not because of a constraining or coercive force of habit. Indeed, this recalls back the definition of “a pattern of behavior under constrained resources”. Some recent research has examined the phenomenon of ‘transport poverty’, wherein households do not have a ready or viable alternative to the car, even if it means using significant shares of their income on travel alone, to the detriment of their welfare [80]. Nonetheless, the nature of the household decision-structure, with the long-term life-style choices, and medium-term mobility choices, implies that households will indeed make substantial, costly, commitments which may be difficult if not impossible to reverse, but which are nonetheless rational, intentional, and

wanted. In other words, how people might perform travel behavior routinely and unreflectively, 'resist' change away from this routine, and yet would agree that they do it intentionally.

Related to the previous point is the idea that intention, or, indeed, commitment, may long precede the action or series of actions that may take place. For example, someone may accept a job position which starts twelve months later and which also involves a significant relocation away from their existing home. They envisage a long commute and prepare to buy an economical diesel commuter. Thus, in the interim, they continue commuting with their existing petrol-powered car; as the job move approaches, they eventually sell their petrol and commute by electric bike as a stop-gap measure. Finally, they make the move and commute by car every day without really thinking of it. This repetitive, unconscious behavior would probably be reasonably described as a travel 'habit', but it took place without any repetitive build-up and no particular deliberation or intentional thought need have preceded the act of driving. Thus, intentional thought is not necessarily to be expected. It must however be pointed out that no single action need have been 'determinately' performed [12].

A final point is that having a view of habit which includes intentionality (or, at the very least, does not exclude it) means that we have a different understanding of what might be involved in behavior change. The idea of habit being anti-intention, or an anti-correlate of intention, or beyond the field of intention, or of intention fading away as habituality secures its stronghold, has implied that, essentially, one must fight impulse with impulse. It presents a rather passive picture of people, as effectively being inertial automata who must be acted upon from outside, without consideration of their life plans and projects. The change of external circumstance, or an external 'shock' or 'nudge' is what is proposed to change people's behaviors [81]. If, however, we accept the hierarchy of life choices as reasonable, then actually the truth is that intentionality and rationality never really leave: In that people might be expected to have some idea of what they want with their lives, however vague, even if they are not reflective of them at every instant. The mobility biography literature has found 'life events', such as changing a job or having a child, to be associated with the number of cars in a household [82,83]. Life events are then proposed as causing behavior change, or as windows of opportunity to encourage behavior change. However, an alternative interpretation which bears intentionality in mind is rather that the people themselves 'originated' the life event, such as the child birth or change of house or job—and then changed their travel behavior (although it need not always be the case—e.g., someone being forced to move house). That is, apparent changes in habits do not happen with intentionality absent from the picture, changes were not necessarily due to external actings upon people, but could have been because of the person's very own intentions (they originate from the people themselves). As another example, the London Olympics, an unplanned-for 'shock' which cannot be reasonably said to have figured in household's rational life plans, did result in changes in travel patterns, but most households reverted back to their usual travel patterns, reflecting perhaps their longer-term conceptions and intentions about what sort of lifestyle they might have wanted [84] (this does not however mean they needed to have explicitly posed themselves this question, nor that they must have conceived of their 'lifestyle' as a single, unitary thing).

5. On Interdisciplinarity: A Reflection

This section reflectively discusses what it was like to perform interdisciplinary research, drawing from two quite different fields.

One difficulty involved was getting to grips with *Intention* itself, which is acknowledged as obscure and challenging even by specialists. This was helped by the growing secondary literature, and also by simply taking the time to read (and re-read) it slowly and patiently. Defining the limits of what was to be discussed was also difficult, because diverse points of discussion seemed frequently to emerge. It is noted that methodologically, this paper did not go into great depth with the concept of habit—and did not attempt to define it as such. It is felt that this was justified, as it seemed the treatment of intention was also justified, and Wittgenstein's brief mentionings of 'habit' in *PI* seems simply to take for granted that the meaning of habit is to be understood depending on the circumstances. This is in fact the point

that his notion of ‘family resemblance’ makes: A given concept or term can have various senses which, like members of a family, may have certain similarities and differences. Thus, a driving habit is to be contrasted with a smoking habit, an exercise habit, etc. At any rate, a full conceptual investigation is beyond the scope of this paper.

One surprise was how relatively smooth a transition was to be had from a discussion of Anscombe to the mobility biography literature, and how Anscombe’s insights could be interspersed into arguments relevant to the mobility biography literature, supporting points made. Rather unexpectedly, it was felt that both disciplines had two common features.

Firstly, they paid attention to people’s lived lives as such (or, in Anscombe’s case, their lived languages). The mobility biography literature, of course, is by nature and definition focused on people’s lives. In the case of Anscombe, as noted earlier, while she does not totally replicate Wittgenstein’s approach to philosophy, she is far from uninfluenced by it. As far as go the matter of lived lives, or lived languages, her approach acknowledges that language is first and foremost a tool that is used in people’s lives. Thus, she is happy to recognize that language is messy and not always clear-cut. She also uses everyday examples to illustrate her points (e.g., shopping lists, routine conversations), rather than pursuing abstract definitions and essences. It is incidentally to be noted, following Foucault [85,86], that when matters of language and life are involved, there are always, potentially, questions about discourse and power, which might determine the articulation, manifestation, or materialization of language and truth. This is to say that meanings and expressions within language itself might be said to be determined by power-conflicts between agencies. If such a view is allowed, the meaning of language and its various interpretations cannot necessarily be taken for granted; categories of language whose boundaries are blurred might be subject to continual negotiation or dispute, and it may be latent power structures which finally settle their in-fact articulations. To undertake an in-depth analysis of the issues would be beyond the scope of this paper, but various relevant applications can be sign-posted, for example in the case of ‘infrastructure as text’ [87] and environmental policy-making more broadly [88–92].

Secondly, neither approaches were strictly theoretical, distinguishing themselves by their methodological features, with the mobility biography literature giving a concrete application to the transportation context. This may explain why it was felt that coherence was possible when these two perspectives were combined (nonetheless, the term theoretical interdisciplinarity is used in place of the equally available methodological interdisciplinarity [9] to describe the form of interdisciplinarity present in this paper, because the focus here is on concepts rather than methods. It is simply how they are named within that particular typology).

It should also be noted that the argument of this paper is not that deliberative behavior in travel is not, as such, bereft of any interest, or does not merit any further study or investigation: Deliberative behavior may become more important in the future, because of the advent of Mobility as a Service (MaaS), where it is conceived that people face a menu of travel mode choices on a single (electronic) platform. It is conceivable that people in the future would deliberate over their options. The point is that as far as the concept of intention goes, deliberation or thought prior to action is not a criterion for calling an action intentional.

6. Conclusions

This paper posed the research question: Is car travel behavior, as a subset of wider travel behavior and of human behavior in general, intentional, habitual, or both? To answer this question, it used an interdisciplinary approach to examine the concepts of intention and habit as have been deployed in transportation research, drawing on the philosophy of Anscombe in *Intention* and the mobility biography literature. It has argued that it is reasonable to speak of behavior in general, and (car) travel behavior in particular, as being intentional and also habitual, and gave illustrative examples of the senses in which this might be said to be the case.

Although this purely conceptual point might seem to be a distinction without a difference, its significance appears to be far from trivial. A minor point is that by eschewing a strict dichotomy between intention and habit, we have a logically consistent basis for keeping the doors open to policy interventions which presuppose that human behavior is described by either one of those concepts. Thus, we prevent ourselves from ruling out certain policy interventions which would be irrelevant if we argued that the concepts were mutually exclusive. There is however a deeper point. To deny of an action that it is intentional has broader logical consequences than immediately apparent. Without intentions, there are no reasons. Without reasons, we cannot speak of persuading people, appealing to their interests, objectives, and goals. We are led to an image of passive inertiality, wherewith people can only be changed from the outside, be it by their being transplanted into a new setting or by a colliding impulse which jolts them off their preordained and predestining path. This leads to the collapse of agency that Schwanen et al. have critiqued [12].

An even broader point has been made here than merely to challenge the dichotomy: It is a challenge of what might be termed a Cartesian picture of total mental priority, which restricts one into such narrow conceptual categories. Its view, in sum, is that mental events, activities, and processes have total priority as far as explanation and conceptual clarification goes. Or, if you want to know what is going on, you have to, first of all, look inside people's heads. This leads to the narrowness of which Shove and Schwanen, amongst others, have raised issues with [12,49], and has meant that policy recommendations for changing behavior have tended to focus only on interacting with the psychology of the individual. In particular, an excessively cognitive focus (i.e., on mental phenomena and processes), and choosing a picture of a contemplative agent presented with a menu of options, would seem to mean focusing on 'instrumental-hedonic' attributes, such as cost, speed of travel, comfort [93]. These are agential attributes, framed by reference to first-person psychology and motivation. And, crucially, because they are framed in terms of the first-person perception or evaluation of the travel choice, they do not directly relate to things in the broader picture which in particular the mobility biography framework brings out: Jobs, housing, and, crucially, the transport infrastructure mentioned at the very beginning of this article, which might all be said to have their equivalents in the 'materials' of Shove's social practice theory [50]. If one now considers that people make whole-life choices, that housing might supersede transport in importance, that these sort of choices might involve some sense of long-term, relatively irreversible commitment and that these choices are certainly intentional, though not in the same way as other choices, then the importance of infrastructure emerges clearly, in a way that it doesn't with more mentalist perspectives [49]. That is, if one focuses only on the picture of the individual person making the travel decision and the co-occurrent psychological activities or processes, it simply is not straightforward to account for how important people's wider life choices, such as where to live and work, are in shaping or having shaped those decisions. One might even say that a lot of the instrumental-hedonic attributes are in fact derivative of the extent of the infrastructure, and certainly not the other way around: Infrastructure (which actually need not be limited to transport infrastructure, but could include the entire gamut of housing and land use) has explanatory priority. Due to the systematic, non-linear, and layered nature of infrastructure, however, it is difficult to focus the node of explanation of transport actions to a single point; and that is certainly not the aim of this paper.

Once infrastructure is allowed its due importance, the responsibility of policy becomes apparent. As transport economists recognize, transport is 'special': Like energy, it exhibits peak and off-peak demand, network effects and constraints, and, crucially, it depends on infrastructure for its provision [94]. Insofar as the extent of infrastructure provision has remained mostly the prerogative of policy-makers—again, not only including roads and railways, but housing and other buildings—transport is utterly inextricable from policy. In the United Kingdom transport sector, for example, despite privatization and a very complex governance network of actors and groups, it is ultimately public bodies who have the hard authority and power to decide what actually gets built and how much money gets spent [95]. This is not only the case in transport, but in broader domains of responsibility which overlap with and affect

it, like land use [96] (for the particular case of parking, which very clearly relates both to transport and land use, see [97]).

A mentalist conception of decisions, insofar as it obscures this importance of wider infrastructure via its focus on agential deliberation, therefore understates the importance of this issue, concentrating on relatively smaller-scale actions that center on the agent's psychology. An historical assessment will reveal that the role of policy in infrastructure, and transport more widely, has been far from passive or inert: It has been contingent, deliberate, and, if this word be allowed, intentional [98]. It is not by any means suggested that there are easy answers to the problems in transport, but by casting a light on the importance of infrastructure in addition to discrete individual motives as such, it is hoped that policy-makers will be encouraged to take a broader view of possible remedies.

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References

1. Anable, J.; Brand, C.; Tran, M.; Eyre, N. Modelling transport energy demand: A socio-technical approach. *Energy Policy* **2012**, *41*, 125–138. [[CrossRef](#)]
2. Whittle, C.; Haggard, P.; Whitmarsh, L.; Morgan, P.; Xenias, D. *Decision-Making in the UK Transport System*; Government Office for Science: London, UK, 2019.
3. Verplanken, B.; Aarts, H.; Van Knippenberg, A.; van Knippenberg, C. Attitude versus general habit: Antecedents of travel mode choice. *J. Appl. Soc. Psychol.* **1994**, *24*, 285–300. [[CrossRef](#)]
4. Verplanken, B.; Aarts, H. Habit, attitude, and planned behaviour: Is habit an empty construct or an interesting case of goal-directed automaticity? *Eur. Rev. Soc. Psychol.* **1999**, *10*, 101–134. [[CrossRef](#)]
5. Lucas, K.; Blumenberg, E.; Weinberger, R. (Eds.) *Auto Motives: Understanding Car Use Behaviours*; Emerald Group Publishing Ltd.: Bingley, UK, 2011.
6. Gardner, B.; Abraham, C. What drives car use? A grounded theory analysis of commuters' reasons for driving. *Transp. Res. Part F Traffic Psychol. Behav.* **2007**, *10*, 187–200. [[CrossRef](#)]
7. Nissani, M. Fruits, Salads, and Smoothies: A Working Definition of Interdisciplinarity. *J. Educ. Thought Revue Pensée Éducative* **1995**, *29*, 121–128.
8. Müggenburg, H.; Busch-Geertsema, A.; Lanzendorf, M. Mobility biographies: A review of achievements and challenges of the mobility biographies approach and a framework for further research. *J. Transp. Geogr.* **2015**, *46*, 151–163. [[CrossRef](#)]
9. Huutoniemi, K.; Klein, J.T.; Bruun, H.; Hukkinen, J. Analyzing interdisciplinarity: Typology and indicators. *Res. Policy* **2010**, *39*, 79–88. [[CrossRef](#)]
10. Pollard, B. Can Virtuous Actions be Both Habitual and Rational? *Ethical Theory Moral Pract.* **2003**, *6*, 411–425. [[CrossRef](#)]
11. Gardner, B. A review and analysis of the use of 'habit' in understanding, predicting and influencing health-related behaviour. *Health Psychol Rev.* **2015**, *9*, 277–295. [[CrossRef](#)]
12. Schwanen, T.; Banister, D.; Anable, J. Rethinking habits and their role in behaviour change: The case of low-carbon mobility. *J. Transp. Geogr.* **2012**, *24*, 522–532. [[CrossRef](#)]
13. Barandiaran, X.E.; Di Paolo, E.A. A genealogical map of the concept of habit. *Front. Hum. Neurosci.* **2014**, *8*, 522. [[CrossRef](#)] [[PubMed](#)]
14. Ajzen, I. The theory of planned behavior. *Organ. Behav. Human Decis. Process.* **1991**, *50*, 179–211. [[CrossRef](#)]

15. Fishbein, M.; Ajzen, I. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*; Addison-Wesley: Boston, MA, USA, 1975.
16. Ajzen, I.; Fishbein, M. *Understanding Attitudes and Predicting Social Behaviour*; Prentice-Hall: Upper Saddle River, NJ, USA, 1980.
17. Mele, A.R. *Effective Intentions: The Power of Conscious Will*; Oxford University Press on Demand: Oxford, UK, 2009.
18. Triandis, H.C. *Interpersonal Behavior*; Brooks/Cole Pub. Co.: Monterey, CA, USA, 1977.
19. Gardner, B. Modelling Motivation and Habit in Stable Travel Mode Contexts. *Transp. Res. Part F Traffic Psychol. Behav.* **2009**, *12*, 68–76. [[CrossRef](#)]
20. Bamberg, S.; Schmidt, P. Incentives, morality, or habit? Predicting students' car use for university routes with the models of Ajzen, Schwartz, and Triandis. *Environ. Behav.* **2003**, *35*, 264–285.
21. Sheeran, P.; Taylor, S. Predicting Intentions to Use Condoms: A Meta-Analysis and Comparison of the Theories of Reasoned Action and Planned Behavior. *J. Appl. Soc. Psychol.* **1999**, *29*, 1624–1675. [[CrossRef](#)]
22. Kaiser, F.G.; Gutscher, H. The proposition of a general version of the theory of planned behavior: Predicting ecological behavior. *J. Appl. Soc. Psychol.* **2003**, *33*, 586–603. [[CrossRef](#)]
23. Valois, P.; Desharnais, R.; Godin, G. A comparison of the Fishbein and Ajzen and the Triandis attitudinal models for the prediction of exercise intention and behavior. *J. Behav. Med.* **1988**, *11*, 459–472. [[CrossRef](#)]
24. Godin, G.; Valois, P.; Jobin, J.; Ross, A. Prediction of intention to exercise of individuals who have suffered from coronary heart disease. *J. Clin. Psychol.* **1991**, *47*, 762–772. [[CrossRef](#)]
25. Forward, S. The prediction of travel behaviour using the theory of planned behaviour. In Proceedings of the International Conference of Traffic and Transport Psychology, Bern, Switzerland, 4–7 September 2004.
26. Elliott, M.A.; Armitage, C.J.; Baughan, C.J. Using the theory of planned behaviour to predict observed driving behaviour. *Br. J. Soc. Psychol.* **2007**, *46*, 69–90. [[CrossRef](#)]
27. De Groot, J.; Steg, L. General Beliefs and the Theory of Planned Behavior: The Role of Environmental Concerns in the TPB. *J. Appl. Soc. Psychol.* **2007**, *37*, 1817–1836. [[CrossRef](#)]
28. Abrahamse, W.; Steg, L.; Gifford, R.; Vlek, C. Factors influencing car use for commuting and the intention to reduce it: A question of self-interest or morality? *Transp. Res. Part F Traffic Psychol. Behav.* **2009**, *12*, 317–324. [[CrossRef](#)]
29. Lindstrom-Forneri, W.; Tuokko, H.; Rhodes, R.E. Getting Around Town: A Preliminary Investigation of the Theory of Planned Behavior and Intent to Change Driving Behaviors Among Older Adults. *J. Appl. Gerontol.* **2007**, *26*, 385–398. [[CrossRef](#)]
30. Gärling, T.; Axhausen, K.W. Introduction: Habitual travel choice. *Transportation* **2003**, *30*, 1–11. [[CrossRef](#)]
31. Gärling, T.; Fujii, S.; Boe, O. Empirical tests of a model of determinants of script-based driving choice. *Transp. Res. Part F Traffic Psychol. Behav.* **2001**, *4*, 89–102. [[CrossRef](#)]
32. Ouellette, J.A.; Wood, W. Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychol. Bull.* **1998**, *124*, 54. [[CrossRef](#)]
33. Verplanken, B.; Aarts, H.; Van Knippenberg, A.D.; Moonen, A. Habit versus planned behaviour: A field experiment. *Br. J. Soc. Psychol.* **1998**, *37*, 111–128. [[CrossRef](#)] [[PubMed](#)]
34. Verplanken, B.; Aarts, H.; Van Knippenberg, A. Habit, information acquisition, and the process of making travel mode choices. *Br. J. Soc. Psychol.* **1997**, *27*, 539–560. [[CrossRef](#)]
35. Verplanken, B.; Walker, I.; Davis, A.; Jurasek, M. Context change and travel mode choice: Combining the habit discontinuity and self-activation hypotheses. *Br. J. Soc. Environ. Psychol.* **2008**, *28*, 121–127. [[CrossRef](#)]
36. Verplanken, B.; Wood, W. Interventions to Break and Create Consumer Habits. *J. Public Policy Mark.* **2006**, *25*, 90–103. [[CrossRef](#)]
37. Chen, C.-F.; Chao, W.-H. Habitual or reasoned? Using the theory of planned behavior, technology acceptance model, and habit to examine switching intentions toward public transit. *Transp. Res. Part F Traffic Psychol. Behav.* **2011**, *14*, 128–137. [[CrossRef](#)]
38. Bamberg, S.; Ajzen, I.; Schmidt, P. Choice of travel mode in the theory of planned behavior: The roles of past behavior, habit, and reasoned action. *Basic Appl. Soc. Psychol.* **2003**, *25*, 175–187. [[CrossRef](#)]
39. Nordfjærn, T.; Şimşekoğlu, Ö.; Rundmo, T. The role of deliberate planning, car habit and resistance to change in public transportation mode use. *Transp. Res. Part F Traffic Psychol. Behav.* **2014**, *27*, 90–98. [[CrossRef](#)]
40. Gardner, B.; Abraham, C. Psychological correlates of car use: A meta-analysis. *Transp. Res. Part F Traffic Psychol. Behav.* **2008**, *11*, 300–311. [[CrossRef](#)]

41. Ajzen, I. Behavioral interventions based on the theory of planned behavior. 2006. Available online: <https://people.umass.edu/aizen/pdf/tpb.intervention.pdf> (accessed on 11 December 2019).
42. Bamberg, S.; Fujii, S.; Friman, M.; Gärling, T. Behaviour theory and soft transport policy measures. *Transp. Policy* **2011**, *18*, 228–235. [[CrossRef](#)]
43. Bamberg, S.; Schmidt, P. Theory-driven subgroup-specific evaluation of an intervention to reduce private car use. *J. Appl. Soc. Psychol.* **2001**, *31*, 1300–1329. [[CrossRef](#)]
44. Eriksson, L.; Garvill, J.; Nordlund, A.M. Interrupting habitual car use: The importance of car habit strength and moral motivation for personal car use reduction. *Transp. Res. Part F Traffic Psychol. Behav.* **2008**, *11*, 10–23. [[CrossRef](#)]
45. Thøgersen, J.; Møller, B. Breaking car use habits: The effectiveness of a free one-month travelcard. *Transportation* **2008**, *35*, 329–345. [[CrossRef](#)]
46. Garvill, J.; Marell, A.; Nordlund, A. Effects of increased awareness on choice of travel mode. *Transportation* **2003**, *30*, 63–79. [[CrossRef](#)]
47. Sniehotta, F.F.; Pesseau, J.; Araújo-Soares, V. Time to retire the theory of planned behaviour. *Health Psychol. Rev.* **2014**, *8*, 1–7. [[CrossRef](#)]
48. Ajzen, I. The theory of planned behaviour is alive and well, and not ready to retire: A commentary on Sniehotta, Pesseau, and Araújo-Soares. *Health Psychol. Rev.* **2015**, *9*, 131–137. [[CrossRef](#)]
49. Shove, E. Beyond the ABC: Climate change policy and theories of social change. *Environ. Plan. A* **2010**, *42*, 1273–1285. [[CrossRef](#)]
50. Shove, E.; Pantzar, M.; Watson, M. *The Dynamics of Social Practice: Everyday Life and How it Changes*; Sage publications: Thousand Oaks, CA, USA, 2012.
51. Bratman, M. *Intention, Plans, and Practical Reason*; Harvard University Press: Cambridge, MA, USA, 1987; Volume 10.
52. Wilson, G.M. *The Intentionality of Human Action*; Stanford University Press: PressPalo Alto, CA, USA, 1989; pp. 483–489.
53. Mele, A.R. Introduction. In *the Philosophy of Action*; Mele, A.R., Ed.; Oxford University Press: Oxford, UK, 1997.
54. Marcel, A.J. *The Sense of Agency: Awareness and Ownership of Action, in Agency and Self-Awareness: Issues in Philosophy and Psychology*; Roessler, J., Eilan, N., Eds.; Clarendon Press: Oxford, UK, 2003; pp. 48–93.
55. Wegner, D.M. *The Illusion of Conscious Will*; MIT Press: Cambridge, MA, USA, 2002.
56. Andersen, R.A.; Buneo, C.A. Intentional maps in posterior parietal cortex. *Annu. Rev. Neurosci.* **2002**, *25*, 189–220. [[CrossRef](#)] [[PubMed](#)]
57. Haggard, P.; Clark, S. Intentional action: Conscious experience and neural prediction. *Conscious. Cogn.* **2003**, *12*, 695–707. [[CrossRef](#)]
58. Teichmann, R. *The Philosophy of Elizabeth Anscombe*; Oxford University Press: Oxford, UK, 2008.
59. Wittgenstein, L. *Philosophical Investigations*; Macmillan: New York, NY, USA, 1953.
60. Hacker, P.M.S. *Wittgenstein: Mind and Will, Volume 4 of An Analytical Commentary on the Philosophical Investigations*; Wiley-Blackwell: Hoboken, NJ, USA, 2000.
61. Glock, H.-J. *A Wittgenstein Dictionary*; Blackwell Reference: Oxford, UK, 1996.
62. Hacker, P.M.S. Philosophy. In *A Wittgenstein Dictionary*; Glock, H.-J., Ed.; Blackwell Reference: Oxford, UK, 1996.
63. Stoutland, F. Introduction: Anscombe’s Intention in context. In *Essays on Anscombe’s Intention*; Ford, A., Hornsby, J., Stoutland, F., Eds.; Harvard University Press: Cambridge, MA, USA, 2011.
64. Timmermans, H.J.P.; Zhang, J.Y. Modeling household activity travel behavior: Examples of state of the art modeling approaches and research agenda. *Transp. Res. Part B Methodol.* **2009**, *43*, 187–190. [[CrossRef](#)]
65. Zhang, J.; Timmermans, H.J.P.; Borgers, A. A model of household task allocation and time use. *Transp. Res. Part B Methodol.* **2005**, *39*, 81–95. [[CrossRef](#)]
66. Kang, J.E.; Recker, W. An activity-based assessment of the potential impacts of plug-in hybrid electric vehicles on energy and emissions using 1-day travel data. *Transp. Res. Part D Transp. Environ.* **2009**, *14*, 541–556. [[CrossRef](#)]
67. Mokhtarian, P.L.; Salomon, I. How derived is the demand for travel? Some conceptual and measurement considerations. *Transp. Res. Part A Policy Pract.* **2001**, *35*, 695–719. [[CrossRef](#)]

68. Chatterjee, K.; Scheiner, J. Understanding Changing Travel Behaviour over the Life Course: Contributions from Biographical Research. In Proceedings of the 14th International Conference on Travel Behaviour Research, Windsor, UK, 19–23 July 2015.
69. Lanzendorf, M. Mobility biographies: A new perspective for understanding travel behaviour. In Proceedings of the 10th International Conference on Travel Behaviour Research, Lucerne, Switzerland, 10–15 August 2003.
70. Giele, J.Z.; Elder, G.H. *Methods of Life Course Research: Qualitative and Quantitative Approaches*; Sage: Newcastle upon Tyne, UK, 1998.
71. Salomon, I.; Ben-Akiva, M. The use of the life-style concept in travel demand models. *Environ. Plan. A* **1983**, *15*, 623–638. [[CrossRef](#)]
72. Scheiner, J. Mobility biographies: Elements of a biographical theory of travel demand (Mobilitätsbiographien: Bausteine zu einer biographischen Theorie der Verkehrsnachfrage). *Erdkunde* **2007**, *61*, 161–173. [[CrossRef](#)]
73. Sattlegger, L.; Rau, H. Carlessness in a car-centric world: A reconstructive approach to qualitative mobility biographies research. *J. Transp. Geogr.* **2016**, *53*, 22–31. [[CrossRef](#)]
74. Clark, B. Understanding How Household Car ownership changes Over Time. Ph.D. Thesis, University of the West of England, Bristol, UK, 2012.
75. Ohnmacht, T.; Axhausen, K.W. Wenn es billiger ist als die Bahn-na ja, warum nicht?: Qualitative Auswertung zu Mobilitätsbiographien, Mobilitätswerkzeugen und sozialen Netzen. *Arb. Verk. Raumplan.* **2005**, 327. [[CrossRef](#)]
76. Miles, A.; Moore, N.; Muir, S. Mobility biographies. Studying travel and transport behaviour in the context of the life course. *Strateg. Sustain. Mobilities Oppor. Chall.* **2013**, 173–188. [[CrossRef](#)]
77. Mannering, F.; Winston, C. A dynamic empirical analysis of household vehicle ownership and utilization. *RAND J. Econ.* **1985**, *16*, 215–236. [[CrossRef](#)]
78. Train, K. *Qualitative Choice Analysis: Theory, Econometrics, and an Application to Automobile Demand*; The MIT Press: Cambridge, MA, USA, 1985.
79. Axhausen, K.W.; Zimmermann, A.; Schönfelder, S.; Rindsfuser, G.; Haupt, T. Observing the rhythms of daily life: A six-week travel diary. *Transportation* **2002**, *29*, 95–124. [[CrossRef](#)]
80. Lucas, K.; Mattioli, G.; Verlinghieri, E.; Guzman, A. Transport poverty and its adverse social consequences. *Proc. Inst. Civ. Eng. Transp.* **2016**, *6*, 353–365. [[CrossRef](#)]
81. Sunstein, C.R. Nudging: A very short guide. *J. Consum. Policy* **2014**, *37*, 583–588. [[CrossRef](#)]
82. Clark, B.; Chatterjee, K.; Lyons, G. *Towards a Theory of the Dynamics of Household Car Ownership: Insights from a Mobility Biographies Approach*; Springer: Berlin/Heidelberg, Germany, 2015; pp. 97–114.
83. Clark, B.; Chatterjee, K.; Melia, S. Changes in level of household car ownership: The role of life events and spatial context. *Transportation* **2016**, *43*, 565–599. [[CrossRef](#)]
84. Transport for London. *Olympic Legacy Monitoring: Personal Travel Behaviour during the Games*; Transport for London: London, UK, 2013.
85. Foucault, M. *Madness and Civilization*; Routledge: Abingdon, UK, 2003.
86. Foucault, M.; Daniel, J. *Les Mots et les Choses*; Gallimard: Paris, France, 1966; Volume 42.
87. Molden, O.C.; Meehan, K. Sociotechnical imaginaries of urban development: Social movements around “traditional” water infrastructure in the Kathmandu Valley. *Urban Geogr.* **2018**, *39*, 763–782. [[CrossRef](#)]
88. Tellmann, S.M. The constrained influence of discourses: The case of Norwegian climate policy. *Environ. Politics* **2012**, *21*, 734–752. [[CrossRef](#)]
89. Feindt, P.H.; Oels, A. Does discourse matter? Discourse analysis in environmental policy making. *J. Environ. Policy Plan.* **2005**, *7*, 161–173. [[CrossRef](#)]
90. Sharp, L.; Richardson, T. Reflections on Foucauldian discourse analysis in planning and environmental policy research. *J. Environ. Policy Plan.* **2001**, *3*, 193–209. [[CrossRef](#)]
91. Richardson, T. Foucauldian discourse: Power and truth in Urban and regional policy making. *Eur. Plan. Stud.* **1996**, *4*, 279–292. [[CrossRef](#)]
92. Bacchi, C. Policy as Discourse: What does it mean? Where does it get us? *Discourse Stud. Cult. Politics Educ.* **2000**, *21*, 45–57. [[CrossRef](#)]
93. Batra, R.; Ahtola, O.T. Measuring the hedonic and utilitarian sources of consumer attitudes. *Mark. Lett.* **1991**, *2*, 159–170. [[CrossRef](#)]
94. Button, K. *Transport Economics*; Edward Elgar Publishing: Cheltenham, UK, 2010.

95. Greg Marsden, I.D. *Governance of UK Transport Infrastructures. Future of Mobility: Evidence Review*; Government Office for Science: London, UK, 2019.
96. Organisation for Economic Co-operation and Development. *The Governance of Land Use, United Kingdom, Land-use Planning Systems in the OECD: Country Face Sheets*; Organisation for Economic Co-operation and Development: Paris, France, 2017.
97. Marsden, G. Parking policy. In *Parking Issues and Policies*; Emerald Group Publishing Limited: Bingley, UK, 2014; pp. 11–32.
98. Gunn, S. Ring Road: Birmingham and the collapse of the motor city ideal in 1970s Britain. *Hist. J.* **2018**, *61*, 227–248. [[CrossRef](#)]



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