PERGAMON

Transportation Research Part A 35 (2001) 695–719

TRANSPORTATION RESEARCH PART A

www.elsevier.com/locate/tra

How derived is the demand for travel? Some conceptual and measurement considerations

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Received 24 June 1999; received in revised form 20 January 2000; accepted 20 January 2000

Abstract

This paper contests the conventional wisdom that travel is a derived demand, at least as an absolute. Rather, we suggest that under some circumstances, travel is desired for its own sake. We discuss the phenomenon of undirected travel – cases in which travel is not a byproduct of the activity but itself constitutes the activity. The same reasons why people enjoy undirected travel (a sense of speed, motion, control, enjoyment of beauty) may motivate them to undertake excess travel even in the context of mandatory or maintenance trips. One characteristic of undirected travel is that the destination is ancillary to the travel rather than the converse which is usually assumed. We argue that the destination may be to some degree ancillary more often than is realized. Measuring a positive affinity for travel is complex: in self-reports of attitudes toward travel, respondents are likely to confound their utility for the activities conducted at the destination, and for activities conducted while traveling, with their utility for traveling itself. Despite this measurement challenge, preliminary empirical results from a study of more than 1900 residents of the San Francisco Bay Area provide suggestive evidence for a positive utility for travel, and for a desired travel time budget (TTB). The issues raised here have clear policy implications: the way people will react to policies intended to reduce vehicle travel will depend in part on the relative weights they assign to the three components of a utility for travel. Improving our forecasts of travel behavior may require viewing travel literally as a ''good'' as well as a ''bad'' (disutility).

Keywords: Travel attitudes; Travel time budget; Travel behavior; Excess travel

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0965-8564/01/$ - see front matter
PII: S0965-8564(00)00013-6

1. Introduction

Since the origin of transportation as a field of scientific inquiry, the tenet that "travel is a derived demand" has been accepted with little question. This view pervades modern transportation planning approaches. For example, in demand models travel is assumed to involve a disutility to be endured for the sake of achieving a desired destination, but one that is minimized. This disutility is modeled as a function primarily of time and cost, and is assumed to increase with each. In project evaluation, the assumed monetary value of travel time savings typically constitutes the largest share of the quantified benefits of a proposed improvement (e.g., Welch and Williams, 1997). Policies directed at the problem of urban congestion often attempt to reduce travel by increasing its cost (disutility) or by bringing destinations closer to origins (through denser and more mixed land use patterns or through information/communications technology (ICT) substitutes). And current efforts to improve regional transportation models take an "activity-based" approach whose premise is that to understand travel we need to understand the demand for the activities that generate the travel.

In a previous paper (Salomon and Mokhtarian, 1998), we reviewed some conceptual and empirical evidence challenging the derived demand paradigm as a behavioral absolute. This paper continues to reassess the assumption that the demand for travel is completely derived from the demand for spatially separated activities. It expands on and extends some of the concepts presented previously, and discusses some important measurement issues that need to be addressed if an intrinsic desire for travel is to be properly identified. As in that previous work, our discussion in this paper refers to personal travel rather than goods movement, but we place no restrictions on mode, purpose, or distance.

The organization of this paper is as follows. Section 2 discusses the phenomenon of undirected travel, and what it can tell us about more destination-oriented travel. Section 3 explores the role of the activity/destination in the demand for travel. Section 4 describes the tripartite nature of an affinity for travel and why it presents a measurement challenge, with survey respondents likely to confound their feelings about travel as an end in itself, with the benefits provided by travel as a means to an end. Section 5 illustrates those measurement difficulties while presenting some specific results, in the context of an ongoing empirical study of the desire for mobility. These results offer partial support for the claim of the existence of a desire to travel for its own sake, and point to productive directions for improving our ability to identify and understand that desire. Section 6 discusses non-travel alternatives for potentially achieving similar levels of utility, together with implications for the theory of a constant travel time budget (TTB). Section 7 summarizes the key points of the paper and makes some concluding observations.

2. The phenomenon of undirected travel

Clearly, the desire to engage in activities at different locations underlies a great deal of the demand for travel. But sometimes, can travel itself not be the activity that is demanded?

There are a variety of activities consisting of what might be called "undirected travel". Joyriding (simply "taking the car out for a spin") is one such activity, [2] but there are many others. Examples include traveling in an off-road vehicle, recreational boating or flying, taking a recreational vehicle cross-country, recreational walking/jogging/cycling/skating/skateboarding, horseback riding, hiking, skiing, hang-gliding, scuba diving, spelunking, taking amusement park rides, and others. These differ widely in terms of distance traveled, typical location, mode used, and impacts on the environment and energy consumption, but they are fundamentally similar in one respect – that travel *is* the activity, movement *is* the object, and a destination, if there is one (or more) in the usual sense of the word, is to varying degrees incidental. [3]

Even sports such as auto racing (or horse racing, 10 K or marathon runs, the Tour de France, or any other form of racing involving a human being driving, riding, or providing the motive power) qualify as undirected travel. Although in those cases the destination (finish line) is arguably of crucial importance, it is an arbitrarily chosen point that is meaningless as a destination in its own right (in that people would not travel to the finish line independently of the race). It is *traveling* to that arbitrarily selected destination in the context of the race (whether faster than others, faster than one's own record, or simply at all) that is the main point of the activity.

Vigorous physical effort is neither a necessary nor a sufficient condition for an activity to constitute undirected travel, although physical exercise may be one motivation for engaging in such an activity. To see that it is not necessary, note that in the list above, the activities involving operating or riding in a vehicle do not require much physical human energy. To see that it is not sufficient, note that there are essentially stationary alternatives to a number of the above activities (e.g., working out in a gym), which can involve considerable human energy expenditure. Movement through space, on the other hand, is a necessary but not sufficient condition for undirected travel. It is necessary, of course, because travel by definition involves movement through space. It is not sufficient because most travel, as has been repeatedly noted, is largely ancillary to reaching a desired destination and engaging in a desired activity. Thus, just "going for a walk" in the neighborhood after dinner is undirected travel; walking through the grocery store to purchase food is directed travel.

[2] Automobile advertisements still play to this phenomenon, sometimes in a nostalgic appeal. Consider the recent campaign for the Chevrolet Impala, appearing, for example, in a four-page foldout on the inside front cover of the 7 June 1999 issue of *Newsweek* magazine: "Remember how great it was just to get in your car and drive? We do. It didn't matter where you were going. All you needed was an open road and a full tank of gas. The world streaming by your window, wind in your hair, sun through the trees, tires humming and the radio on. Hot summer days, dusty dirt roads. Not a care in the world. Whatever happened to that? The pure joy of a long drive, a great car, and no particular place to go. Isn't it time somebody brought that back? The New Chevy Impala. Let's go for a drive". A similar theme is portrayed in a current television advertisement, with the 1964 Chuck Berry song "No Particular Place to Go" playing in the background: "Ridin' along in my automobile/My baby beside me at the wheel/I stole a kiss at the turn of a mile/My curiosity runnin' wild/Cruisin' and playin' the radio/With no particular place to go".

[3] In this context, it is important to distinguish between the general location of an activity and the micro-scale destination, or lack thereof, of the activity itself. For example, the general location at which scuba diving occurs is obviously not incidental: the Great Barrier Reef is preferable to the community swimming pool. But the actual activity of scuba diving may involve a more or less random path within a general area, with no particular spot being the target of the activity. Thus, travel *to* the Reef is directed, but the scuba diving activity itself represents undirected travel.

What characterizes undirected travel, then, is movement through space for which the *destination* rather than the travel is ancillary. Whereas the strict view of travel as a derived demand would hold that the destination is always 100% primary, we suggest that the set of all travel for which destination is primary is a fuzzy one (see, e.g., Smithson, 1987; Zimmermann, 1985). Stated another way, the relative proportions of "primariness" of the travel and the destination constitute a continuum, as shown in Fig. 1. These proportions can vary by person and situation, even for the same type of activity. For example, strolling through the shopping district of a foreign city may in one case be largely undirected (mainly to absorb the novel ambience), in another case largely directed (mainly to buy souvenirs), and in yet another case nearly equal parts of both. One message of this paper is that the relative degrees to which travel and the destination are ancillary are often difficult to measure, especially when the traveler/survey respondent herself may not have consciously articulated the distinction. As will be argued in Section 3, our predisposition to view travel as a derived demand may cause us to overestimate the degree to which travel is ancillary to the destination instead of a situation more toward the middle or even the opposite end of the spectrum.

Almost by definition, undirected travel is for the most part a leisure activity (except for the relatively few professional practitioners of each type). This is not however to dismiss its importance as an indicator of the positive utility of travel in general, for three reasons. In the first place, rather than diminishing that importance, it strengthens it to realize that so many people, for so much of their limited discretionary time, choose to spend it not just traveling to activities, but on traveling *as* an activity. Just how many people, and how much time, is difficult to determine from current data collection instruments that do not distinguish travel as a (leisure) activity from either travel to an activity or other leisure activities. It would be valuable to make that distinction in the future.

Second, contrary to popular complaint, leisure time in developed countries does not seem to be declining. For the US, Robinson and Godbey (1997) report that the average weekly hours of free time (which would include stationary free-time activities, undirected travel as an activity, and travel to free-time activities) rose from 35 in 1965 to 40 by 1985, remaining approximately stable since then. In Germany, Chlond and Zumkeller (1997) note that increases in paid vacation time and decreases in weekly work hours have resulted in greater leisure time. Further, total travel is growing and travel for leisure purposes appears to be a growing share of total travel. Anable (1999), Lanzendorf (1999) and Tillberg (1999) indicate that leisure activities currently account for

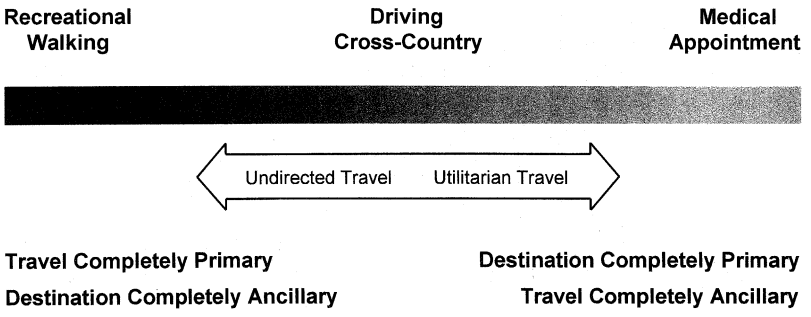

Fig. 1. Relative degrees to which destination and travel are primary.

half of total distance traveled in the UK, Germany, and Sweden, respectively. Robinson and Godbey find that only 3 h a week are spent on all free-time travel, out of 10 h a week total travel time, but as indicated above, much undirected travel is likely to be classified as an activity rather than as travel. Even so, the amount of time spent on undirected travel is doubtless small now, and apt to remain a small proportion of the total. However, it is also likely to increase in the aggregate over time, as rising incomes continue to result in rising amounts of leisure time and leisure travel (Schafer and Victor, 1997; Tanner, 1981).

Third, the fundamental nature of undirected travel may hold to some degree for more directed travel. The examples of undirected travel given above serve to illustrate some of the aspects intrinsic to travel that contribute to its positive utility: the sensation of speed, the exposure to the environment and movement through that environment, the ability to control movement in a demanding and skillful way, the enjoyment of scenic beauty or other attractions of a *route*, not just a *destination* (Hupkes, 1982). It is likely that those same positive aspects of travel apply, to some extent, to ancillary or directed travel as well. Many authors (Berger, 1992; Flink, 1975; Marsh and Collett, 1986; Sachs, 1992; Wachs and Crawford, 1992) have commented on the sense of independence, control, expression of status or identity, and mastery of a skill afforded by driving a personal automobile. Individuals who place a high value on those attributes may, for example, choose to drive to work in a congested central business district even when public transportation is actually both faster and cheaper. A desire for exposure to and movement through the environment is doubtless partially responsible for some people choosing not to telecommute even when they are able to do so (Mokhtarian and Salomon, 1997). The beauty or novelty or some other characteristic of a particular route may motivate an individual to travel that route even when it is not the shortest way to a desired destination. These outcomes are examples of excess travel in the sense that lower cost, time, and/or vehicle-kilometers-traveled alternatives are available but not chosen because of an intrinsic desire (or a positive utility) for travel. (We define excess travel more formally in Section 4.4. Here, we make the following semantic distinction: undirected travel is a subset of excess travel, but excess travel can also constitute or, more often, augment a trip that is basically directed or utilitarian, as in the examples above.)

3. Which came first, the activity or the trip?

In the previous section we pointed out that the destination of a trip may in some cases play a more ancillary role to the trip itself. In this section we discuss further the role of the destination in the demand for travel.

Conventional trip distribution (Papacostas and Prevedouros, 1993) or destination choice models (Barnard, 1987; Jones, 1978) consider the utility of a given destination to be inversely related to the generalized cost of reaching it and directly related to some measure of the attractiveness of the destination. Hence, a tradeoff between the disutility of travel and the utility of the activity at the destination is explicit, and the choice of a more distant destination is completely consonant with the concept of travel as a derived demand when the increased attractiveness of that more distant destination outweighs the increased disutility of travel required to reach it. Thus, for example, a more distant shopping center may be chosen if it has more variety or better

prices or a particular hard-to-find item. A more distant restaurant may be chosen when the decision-maker is in the mood for the kind of food it serves, or the atmosphere it possesses.

However, we suggest that there are situations in which a more distant destination is chosen, not entirely because the utility of its inherent attractiveness exceeds the disutility of travel, but because a positive component to the utility for travel contributes to making the net utility of that destination–trip combination the highest among the alternatives. Consider the situation in which, in a dense urban environment, there are a number of franchises of the same "favorite" restaurant or coffee house. Only one is "nearest". Yet an individual may habitually visit more distant ones as well as the closest, not because of an intrinsic greater attractiveness of the more distant franchises (in fact they may look and "feel" virtually identical to the nearest one), nor even particularly because of a greater attractiveness of the neighborhoods in which the more distant facilities are located, nor because of trip chaining economies, but purely out of a variety-seeking impulse.

In this example, a variety-seeking orientation leads to excess travel. It should be understood that the attribute "contributes variety" is not entirely intrinsic to the destination itself nor to the vicinity of the destination – to the extent that it is, variety can be considered part of the attractiveness measure of the destination. Instead, at one extreme, variety is a property of the route rather than the destination, and hence (apparently) excess travel is an inevitable accompaniment to the achievement of variety.

What about another prevalent human characteristic, curiosity? Curiosity (often, to be sure, mixed with more directed goals such as the search for physical resources or commercial opportunities) may be the trait that launched a thousand ships, and pedestrian forays, and horses, and covered wagons, and airplanes, and rockets. One could argue that novelty or uncertainty should be part of the attractiveness measure of the (often unknown) destination, but it seems at least equally useful to view curiosity (in its particular manifestation as an exploration impulse) as a generator of what must surely be considered excess travel. Today, curiosity still impels us to travel "out of our way", whether to see a new development on the other side of town or to visit an intriguing location on the other side of the planet, and stimulates us to dream of traveling to the other side of the solar system and beyond.

Thus we see that there are several related traits such as variety- (or adventure- or novelty-) seeking and curiosity that have the result of increasing the utility of more distant destinations and/or inevitably generating travel in order to satisfy those traits. We suggest that in many of these situations, the demand for travel is not so much derived from the demand for a specific activity at a specific location, but that both the travel and the activity/location are derived from the demand to satisfy the impulse in question.

This in turn suggests that viewing the desire for a particular activity as antecedent to and causative of the demand for traveling to that activity may not always be accurate – although it is presumably the most common situation. But in some cases, as just indicated, the demand for both travel and activity may be caused by a third set of factors. And in other cases, the complete reverse of the usual situation may occur: the demand for an activity may arise *as a consequence* of the desire to travel.

Consider, for example, the choice to eat out instead of eating at home, even though ample food is available at home. In some cases, eating out may be preferred because a certain type of food or a certain neighborhood or a certain ambience is actively desired. In these situations, the decision to eat out and the destination may be chosen simultaneously, and the utility of a *particular*

destination–travel combination (the net of the positive attractiveness of the destination and the putatively negative utility of travel) exceeds the utility of the home alternative (the net of a lower attractiveness plus zero travel). In other cases, the disutility of cooking and cleaning up is the primary motivation for going out to eat, and the destination may be a secondary choice. In the present context, it is a third type of situation that is of interest. In these cases, also involving a sequential rather than simultaneous choice, the desire just to get out and go *somewhere* (another form of variety-seeking) manifests itself in deciding to eat out instead of staying at home. The destination/activity becomes an excuse or justification for the desired travel. Many other such examples are possible, in which the (perhaps subconscious) decision to travel is made first, and then a destination/activity is invented to support that decision and yes, increase its utility. The "Sunday drive", which was so common during the early popularization of the automobile, probably often fit this situation, although a desire to see the scenic countryside was often a destination-specific motivation as well (Muller, 1986).

Such cases may arise more often than we realize, because we have not tried to measure them as such. We see that a destination is reached and an activity is carried out, and we assume that activity to have generated the trip. Instead it may be the trip that generated the activity!

4. The tripartite nature of the affinity for travel

If a positive utility for travel exists at all, it is important to understand it better than we do now. How does such a positive regard for travel differ by personality type and other individual characteristics, by travel purpose, by mode and trip length? Can we identify the impact a positive utility for travel has on the objective amount an individual travels – that is, its contribution to excess travel?

Measuring an individual's affinity or liking for travel is a fundamental first step in this process. If travel affinity can be appraised in some generic way, it becomes possible to explore causes and effects of that affinity. Obtaining a reliable measurement of travel liking, however, is a non-trivial matter. This is because an individual's expressed affinity for travel is likely to be a composite of positive utilities for three different elements, in unknown and varying proportions. These three elements are conceptually distinguishable but empirically apt to be confounded. They are:

1. the activities conducted at the destination;
2. activities that can be conducted while traveling;
3. the activity of traveling itself.

We briefly discuss each of these elements in turn, and then use them to define excess travel.

4.1. Activities conducted at the destination

When a respondent reports that she "loves" vacation travel, it is unlikely that she is referring to the 15 h in one or more crowded and noisy airplanes, the 6 h waiting in uncomfortable airports eating overpriced and unpalatable food, and the 3 h of ground access travel in peak-period urban traffic. It is more likely that a halo effect (Sommer and Sommer, 1997) is at work, so that she is confounding the positive appeal of the destination with the travel required to reach it (the halo effect is a type of response bias identified by survey researchers, in which the respondent bases the

answer to a specific question on a general impression about the subject). The implication, to which we return in Section 6, is that if she could forgo the travel to the destination, she would. However, it is also possible to be cognizant of the unpleasant aspects of travel itself but for those to be outweighed by the positive aspects *of travel* (not just the destination), such as those discussed in Sections 4.2 and 4.3.

4.2. Activities that can be conducted while traveling

In reporting an affinity for traveling, individuals may in part be considering the utility of activities they can conduct while traveling. In some cases, it is in fact the "anti-activity" (or the absence of other activities) that is important – that is, the ability to use the time for relaxing or thinking, including "shifting gears" mentally between the origin and destination activities and roles. As one analyst put it, "Thanks to the construction of interstate highways, the entry of women into the work force, and several other social revolutions, driving has become America's most important source of quiet time" (Edmonson, 1998, p. 46). In other cases, the concomitant activity is external: making and receiving mobile phone calls (including shopping and checking stock quotes on or off the Internet, as well as engaging in conversation); reading; listening to music, talk shows, or books on CD, radio, or cassette; watching television or videos (not only in airplanes but now in some personal vehicles such as the Oldsmobile Silhouette Premier and the Ford Econoline Conversion Van). The phenomenon of "carcooning" is one manifestation of this aspect, in which the personal vehicle is customized for the traveler's comfort, almost as a sanctuary-escape from the world (Crawford, 1992; Larson, 1998). [4] But as the preceding list indicates, this aspect of a liking for travel is not restricted to the automobile; in fact some people prefer public transportation to the private auto precisely because not having to operate a vehicle offers the opportunity to engage in other activities while traveling. Cycling and walking as modes of directed travel also offer opportunities for quiet time, listening to music, and the additional benefit of physical exercise while traveling.

Several researchers have noted that for some people the commute to work fulfills various positive roles (Richter, 1990; Salomon, 1985; Shamir, 1991; Mokhtarian and Salomon, 1997). Some of these roles relate to the utility of the commute as a desired transition between work and home, which allows for the types of activities and anti-activities described above. Work-related travel for mobile professionals often fulfills similar functions. Anecdotally, a number of such professionals have remarked that long trips represent "the only time for thinking" they have, or "the chance to catch up" on reading or other neglected but important tasks.

[4] A recent advertisement for the Toyota 4Runner sport utility vehicle (appearing, for example, on the inside back cover of the 7 June 1999 issue of *Newsweek*) plays to this component of utility: "Escape. Serenity. Relaxation. The 1999 Toyota 4Runner Limited puts them all well within your reach. With features like a leather-trimmed interior, a CD sound system as well as more than a dozen new refinements, you might actually find the journey to be as rewarding as the destination".

4.3. The activity of traveling itself

The third element of a liking for travel is a consequence of intrinsic aspects of travel itself. These include the characteristics discussed in Section 2: the sensation of speed, movement through and exposure to the environment, the scenic beauty or other attraction of a route. Arguably, only this element represents a true affinity for travel itself. Whereas in the other two categories travel is valued as a means to an end (either performing activities at a fixed destination or performing activities in transit), in this case travel is (at least in part) the end in itself (Reichman, 1976). [5] For instance, an individual may in fact actively choose 24 h of traveling in an automobile or recreational vehicle over a much shorter time of travel in an airplane to the same farthest point, for the opportunity to see many sights on the way to a "final" destination. In cases where there is not so much a single major destination as many linked ones, the airplane may not even be a realistic alternative. This situation is discussed further in Section 6.1.

Traveling in response to a variety-seeking or curiosity impulse may represent a somewhat more indirect relationship, since those personality traits may be less specific to travel than attitudes directly related to characteristics of travel such as movement and speed. However, these personality and attitudinal impulses are similar in that (a) both have alternate, non-travel ways of potentially satisfying them (as discussed in Section 6.3), but (b) in both cases, travel for its own sake is likely to be an often-preferred way of satisfying them. Thus the personality traits of variety-seeking or curiosity are possible causal variables generating a liking of travel for its own sake, just as the attitudes of "loving speed" or "loving scenic beauty" are other possible causal variables for travel affinity.

4.4. A definition of excess travel

If it is considered desirable to try to quantify the impact that a positive utility for travel has on an individual's objective amount of travel, then it is important to be clear about what constitutes such "excess travel". Simply equating "excess" to "unnecessary" is problematic. Leisure activities are discretionary, and hence in some sense unnecessary. Is all travel for leisure activities excess? We do not adopt that extreme a view: we would not classify as excess a shortest-path trip generated by the pre-existing demand for a leisure activity, although it may be unnecessary.

Some examples of excess travel were offered in Section 2: cases in which lower-VKT (or lower-time/cost) alternatives were available but not chosen because of a positive utility for travel. This implicit definition can now be made more explicit based on the foregoing discussion of the components of an affinity for travel. Namely, we specify excess travel to be that portion of travel that is prompted by the second and third elements of an affinity for travel, that is, any travel not derived from the utility of the destination itself. Thus, excess travel would include the subset of leisure activities identified as undirected travel in Section 2, which are a manifestation of the third element – a positive utility for travel itself. But it would not include the travel *to* those activities,

[5] Again, automobile advertisements frequently play to this concept. A 16-page Chrysler ad in the center of the 18 October 1999 issue of *Newsweek* included tag lines such as: "Because driving should be a destination in itself" and "it does something no other minivan can: make you wish the journey were a bit longer."

which is derived from the demand to be in a location where the undirected travel can be performed.

This definition may make sense theoretically, but it is not easy to operationalize it. For one thing, without perfect knowledge of a person's choice set (the alternatives that are truly feasible under the circumstances), it is impossible to know whether the chosen alternative is in fact lowest-VKT or not – it may only appear to involve excess travel (a longer route, a non-optimal mode) to the analyst. Second, as indicated in Section 3, despite the utility of the destination itself, it may not always be the most important generator of the trip. This is especially true for leisure activities, but as previous examples have shown, it can also be true for mandatory activities (commuting even when telecommuting is feasible) and maintenance activities (eating out as a solution to "cabin fever"). Third, in assessing and reporting the attractiveness of a destination, a respondent may be partly influenced by his utility for the second and third elements of an affinity for travel. Thus, even some travel which appears to fit the derived demand paradigm may be "excess" in ways that are difficult to disentangle.

5. Empirical indications

5.1. Background

The preceding discussion has made clear some of the difficulties associated with empirically measuring the existence and impact of a positive utility for travel. Nevertheless, the importance of the issues raised here makes the measurement challenge worth undertaking. One goal may be to quantify the amount of excess travel that occurs, and under what circumstances. Such insight could inform the design of policies more responsive to natural inclinations (including policies that attempt to influence or channel inclinations in socially beneficial ways), and improve our predictions of the reaction to various policies.

Independently of attempting to calculate kilometers of excess travel, however, it is useful to explore further the general concept of travel affinity and its distribution in society. We have developed and administered a survey with that second goal in mind. As is often the case, our thinking has continued to evolve after the completion of the survey, so that many of the ideas presented here were not fully articulated at the time of data collection. Further, as is also often the case, in designing the survey we consciously traded off depth against breadth, in this context favoring breadth. That is, we chose to obtain somewhat general data on a large number of concepts of interest, rather than situation-specific data in a more narrowly-defined context. The latter approach is probably essential to a goal of quantifying the amount of excess travel, but the former approach is consistent with our goal of increasing understanding of general concepts (although with limitations even in that respect). As a consequence of these factors, we can (and do) suggest a number of ways in which future related studies can build on and refine the data collected in this one. Nevertheless, we believe that the preliminary empirical results reported here are still strongly suggestive, even if not definitive.

Our 14-page questionnaire collects data on general attitudes toward travel and related issues, affinity for travel, objective and perceived amounts of travel, satisfaction with one's amount of travel, personality traits, lifestyle orientation, and demographic characteristics. The questions

relating to affinity for travel and amounts of travel distinguish between short distance and long distance (more than 100 miles one way, consistent with the definition of long distance leisure travel in the American Travel Survey), and within each of those categories obtains an overall measure and separate measures for several different purposes and modes.

Some 8000 surveys were sent to residents of three communities in the San Francisco Bay Area, representing a variety of land use patterns. With an overall response rate of more than 25%, after discarding responses with too much missing data we retained about 1900 cases for further study. Due to sampling biases (in the selection of particular neighborhoods, although sampling within neighborhoods was entirely random) and self-selection in responding, the sample (and hence the distributions of variables discussed here) cannot be assumed to be perfectly representative of the general population. Nevertheless, the findings serve to support the existence of a positive utility for travel, even if the precise distribution of that utility across the population is uncertain.

Detailed analysis of the data is underway, and future papers will present results from a variety of empirical explorations. Here, we focus on a few summary results that illustrate some of the issues we have presented in this paper. As background to interpreting the results, it should be noted that in the cover letter to the survey, travel was defined as "moving any distance by any means of transportation – from walking around the block to flying around the world." In questions relating to the amount of travel conducted or desired by respondents, they were asked (borrowing wording from the American Travel Survey) to exclude "travel you do as an operator or crew member on a train, airplane, truck, bus, or ship".

5.2. Travel affinity

To directly measure the affinity for travel, the question was asked, "How do you feel about *traveling* in each of the following categories? We are *not* asking about the activity at the destination, but about the travel required to get there". Respondents were then asked to rate short and long distance travel, overall and by purpose and mode, on a five-point scale from strongly dislike to strongly like. Despite our attempt to alert respondents to distinguish the destination activity from the travel, it is likely that even many of those who actually read the instructions (and more of those who did not) were unsuccessful at doing so.

Clear differences between overall ratings for short and long distance travel emerge, as shown in Fig. 2(a) (where for economy of presentation the five-point scale has been collapsed to the three points dislike, neutral, like). Levels of dislike are similar for both short distance (13%) and long distance (11%) travel. But a majority (55%) of respondents are neutral about short distance travel, whereas an even larger majority (63%) are positive about long distance travel. Thus, there is clearly a stronger affinity for long distance travel, but even short distance travel is not viewed negatively.

Differences are also apparent by purpose and mode, in the expected directions. Figs. 2(b) and (c) show that, for short-distance travel, respondents have greater affinity for entertainment/recreation/social activity-related travel than for travel related to other kinds of activities, and greater affinity for travel by personal vehicle and walking/jogging/bicycling than for travel by public transportation. For long distance travel (Fig. 2(d)), respondents like travel for entertainment/recreation/social activities far more than travel for work, and travel by plane somewhat more than travel by car. Again, it is probable that respondents are partly confounding the utility

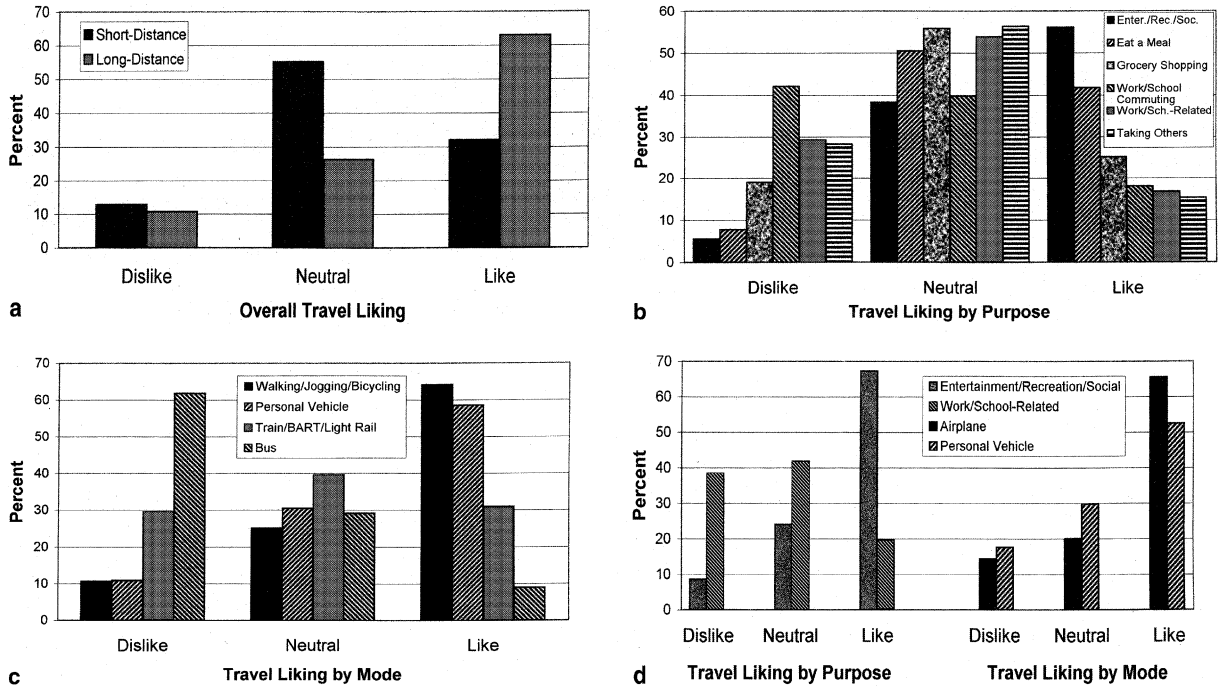

Fig. 2. (a) Overall travel liking by distance category ($N = 1904$). (b) Liking for short-distance travel by purpose ($N = 1904$). (c) Liking for short-distance travel by mode ($N = 1904$). (d) Liking for long-distance travel by purpose and mode ($N = 1904$).

for the activity at the destination with the utility for the travel required to reach the destination, as well as potentially including the second element, utility for activities conducted while traveling. For example, vacation travel may be better liked than work travel if one brings work to do on the work trip but novels to read or knitting to do on the vacation trip. Being with family members on the vacation may also increase its utility for many.

It is tempting to argue that the mode-specific ratings are more indicative of a true travel affinity (the third element of utility) than are the purpose-specific ones. Theoretically, "travel is travel" – if differences in destination activity and in activities conducted while traveling are factored out, a 10-h flight is a similar physical experience whether it is for work or for leisure. Differences in liking for travel by auto and plane, on the other hand, may reflect genuine differences in comfort, convenience, control, and other attributes intrinsic to those modes. However, the situation is not that simple. First, even the mode-specific ratings are not immune to confounding with utility for activities conducted while traveling: for example, an airplane flight may be more conducive to relaxing or multitasking and hence have higher utility than a trip of comparable length as a solo automobile driver. Second, likely interaction effects between purpose and mode complicate making the appropriate inference. A higher expressed affinity for plane than for auto may be partly based on the fact that for the respondent in question, plane is more often associated with leisure travel and auto is more often associated with work travel. Conversely, a higher rating of leisure travel compared to work travel may reflect a higher content in leisure travel of those

undirected travel activities (often by unusual modes) described in Section 2, in which attributes intrinsic to travel contribute heavily to utility. But the desirability of obtaining ratings for each mode–purpose combination must be traded off against the added burden on the survey respondent.

Nevertheless, the extent of the affinity for travel across most of the categories is striking. We have already discussed some reasons why commuting may have positive utility, but even trips for activities that most people would consider chores (chauffeuring, grocery shopping) are liked by 15–25% of the sample. The most disliked type of travel is that which takes place in a bus, but even that is rated neutrally or positively by more than a third (38%) of the sample. (However, some proportion of the neutral responses may simply reflect a lack of experience of the respondents with that mode, rather than a considered opinion.)

5.3. Indicators of excess travel

Individuals with a liking of travel should manifest that predisposition in their travel behavior. To help assess that behavioral outcome, the survey asked respondents about their participation in 13 different indicators of excess travel. The question was kept as mode- and context-neutral as possible. Specifically, respondents were asked, "Keeping in mind that travel is going any distance by any means, how often do you travel . . ." in each of the 13 ways shown in Fig. 3, with possible responses of never/seldom, sometimes, and often.

For two of the indicators shown in Fig. 3 – to explore new places and to see beautiful scenery – it could be argued that the utility of the destination is prompting the travel behavior. It may therefore not be particularly surprising that those were the two most popular choices based on combining the "sometimes" and "often" responses (only 13% of the sample "never" did each of those two indicators). Some other indicators (to relax, when time is needed to think, to clear one's head, and mainly to be alone) are based on the utility of what can be accomplished while traveling. These represent the 6th, 8th, 10th, and 11th most common choices, respectively. The remaining seven indicators are intended to reflect a desire to travel for its own sake – and appear to be quite common although perhaps not universal. For example, traveling "just for the fun of it" was ranked 4th, done sometimes or often by three-quarters of the sample. Traveling "by a longer route to experience more of your surroundings" ranked 5th, done by nearly two-thirds of the sample. Going "to a more distant destination than necessary, partly for the fun of traveling there" was 7th, done by more than half of the sample.

Overall, more than half of the sample sometimes or often engaged in seven or more of these 13 indicators. More than one-fifth did 10 or more. Only 2% of the sample never did any of them. Focussing only on the seven measures most purely indicative of a desire to travel for its own sake, half of the sample engaged in four or more of those seven, and only 6% never did any of them.

5.4. Personality traits

The survey asked respondents to rate 17 personality characteristics in terms of how well each one described them. Again collapsing a five-point scale into a three-point scale, Fig. 4 presents the

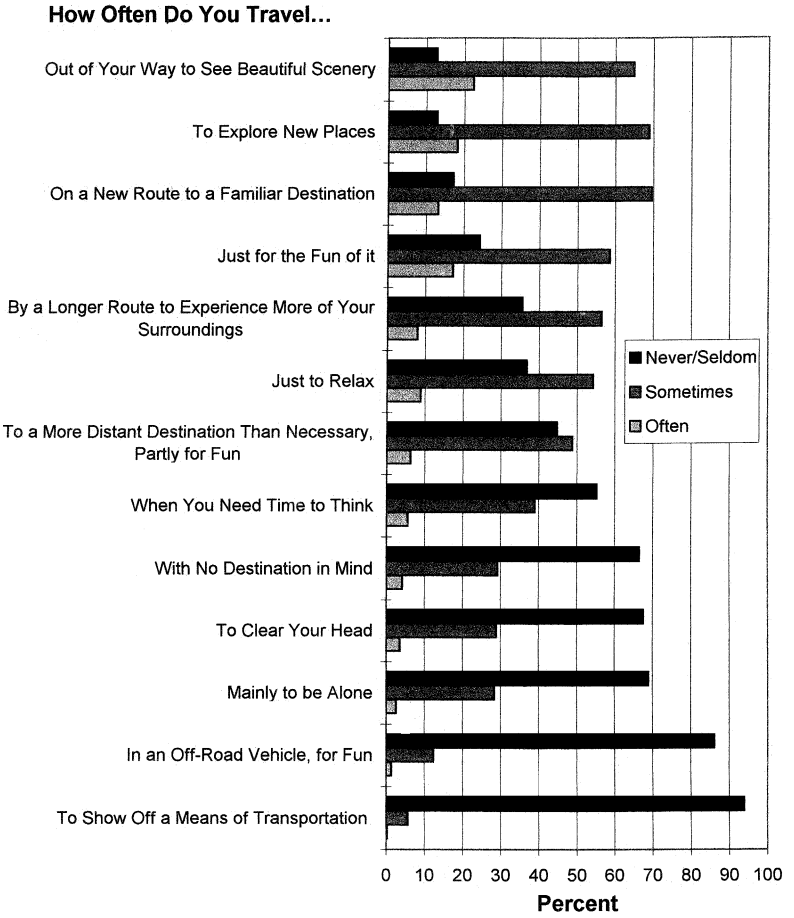

Fig. 3. Engagement in excess travel ($N = 1904$).

responses to five of the traits most relevant to the discussion in this paper. More than half the sample felt that "variety-seeking" or "adventurous" described them very well or almost completely. A third described themselves as liking to move at high speeds, and nearly a fifth considered themselves restless. Only 18% "liked to stay close to home", while more than a third of the sample felt that phrase described them not very well or hardly at all.

Apparently, the raw ingredients for an impulse to travel for its own sake are present in a sizable portion of the sample. The extent to which this is the case is probably overestimated due to a social desirability bias (Dillman, 1978) toward traits perceived to be positive. However, such a bias is unlikely to account for all the responses of that type, especially since sizable portions of the sample were willing to describe themselves in the opposite way (indicating the absence of such a bias for at least those respondents, and presumably others). In future research, a specialized survey could be designed to measure these traits more indirectly, through responses to a variety of questions or statements related to each trait. Such an approach would minimize response bias compared to the direct self-classifications elicited here.

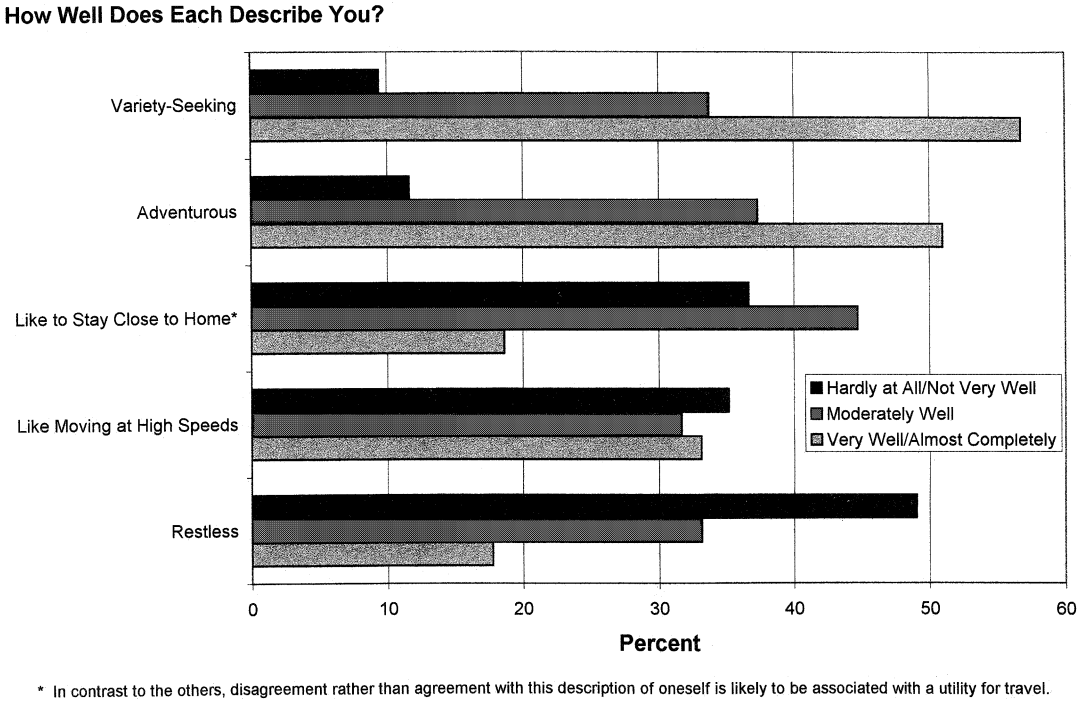

Fig. 4. Distribution of key personality traits ($N = 1904$).

5.5. Attitudes toward travel

Additional evidence for both the second and third elements of a positive utility for travel is found in a series of attitudinal statements to which responses were measured on a five-point Likert-type scale. Fig. 5 presents the responses to the statements from this section that relate to those aspects of the utility for travel, collapsed to a three-point scale of disagree, neutral, agree. With respect to the ability to conduct other activities while traveling, more than four-fifths of the sample sees value in linking errands to the commute trip. Nearly half disagree that travel time is generally wasted time. More than a third see their commute trip as a useful transition, and use that time productively. With respect to traveling itself, more than two-thirds of the respondents disagree that "the only good thing about traveling is arriving at your destination", and nearly half agree that "getting there is half the fun".

These latter responses in particular suggest the existence of a large group of people seeing at least some intrinsic utility for travel. Clearly, however, responses to these and many of the other attitudinal statements of this section (primarily relating to disadvantages of travel) are likely to vary by mode and purpose, whereas we only obtained a "generic" response. Future research may need to narrow the focus of these statements in order to obtain data that may relate more strongly to specific travel outcomes.

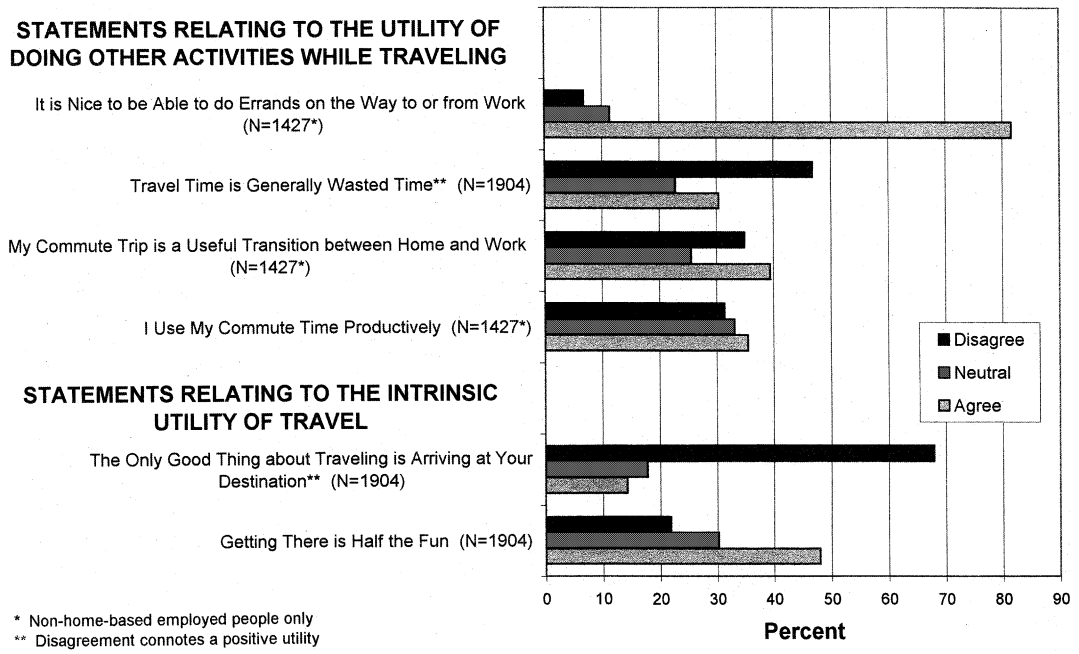

Fig. 5. Attitudes toward travel.

5.6. Ideal commute time

Another measure that is likely to be a complex function of all three elements related to a positive utility for travel is a respondent's ideal commute time. An individual's ideal commute time may be different from 0 because (as seen in Section 5.5) she values the transition between home and work and the ability to use the time productively (the second element), or because she values the opportunity to drive a status-oriented automobile or the chance to experience the environment by traveling (the third element), or because she values a non-home destination for work due to the social/professional interaction opportunities, the scenic location, or the shopping and other locational amenities it offers (the first element).

The ideal commute time question in our survey was placed immediately following the series of attitudinal questions relating to both positive and negative aspects of travel, so that respondents would be more likely to have a range of attributes in mind when they answered this question. The wording of the question itself also attempted to project a balanced perspective: "Some people may value their commute time as a transition between work and home, while others may feel it is stressful or a waste of time. For you, what would be the ideal one-way commute time?"

For the 1384 current workers who responded to this question, the average reported ideal one-way commuting time was just over 16 min. Only 3% desired a 0–2 min commute, suggesting that entirely eliminating the commute does not resonate with most people as a desirable aspect of telecommuting – for any or all of the three reasons described above. Almost one-half of the respondents preferred a commute of twenty minutes or more. Further analysis of this variable is found in Redmond and Mokhtarian (1999). In future studies, it may be valuable to obtain data on

satisfaction with a range of commuting times (i.e., to obtain an entire satisfaction curve), similar to the approach of Young and Morris (1981), rather than obtaining just the single maximum point of the curve.

6. What are the alternatives?

6.1. Applying the teleportation test

It is important to try to distinguish the three elements of an affinity for travel discussed in Section 4, both in our conceptual formulation of the subject, and in our measurement of individuals' possession of that affinity. A stated preference approach could prove helpful in the latter regard, allowing the analyst to systematically vary one of the three elements while keeping the other two fixed. Another, whimsical but potentially useful, way to help make the distinction – in either the conceptual or the empirical context – may be to apply the "teleportation test". The question is, "if you could snap your fingers or blink your eyes and instantaneously teleport yourself to the desired destination, would you do so?"

For the three elements described in Section 4, the answers seem to be yes, maybe, and no, respectively. That is, in circumstances where an expressed utility for travel actually derives completely from the activity at the destination (the first element), a person should not hesitate to eliminate the undesired travel while still achieving the desired spatial separation from the origin. In circumstances where utility is derived from multitasking while traveling (the second element), the answer might depend on the perceived ability to accomplish the same tasks without the travel, as discussed in Section 6.3.

In circumstances where there is a utility to traveling itself (the third element), a person would choose to travel even if a teleportation alternative were available. For example, the 48% of Section 5.5 who agreed that "getting there is half the fun", or the 68% who disagreed that "the only good thing about traveling is arriving at your destination", may not be receptive to teleportation. The individual who wants to tour the US by car, or Europe by rail, may selectively teleport himself between some desired destinations, but complete teleportation from spot to spot is unlikely to appeal to those who want a sense of connectivity between locations, linkage to the surrounding geographical and cultural context, and/or enjoyment of a route as well as a destination. This orientation contributes to a preference, for some people in some circumstances, of ground-based alternatives over air travel (which begins to approach teleportation in its disconnection between origin and destination).

Of course, neither the utility nor the response to the teleportation test must fall into only a single one of the three categories we have identified – another case of fuzzy membership. An individual's utility for her activity set (and even for any single activity) may have all three elements to varying degrees, and hence with a teleportation alternative, travel would be eliminated or retained in similarly varying degrees.

Applying the teleportation test is more than just an exercise in futile fantasy; it offers insight into the likely reaction to real changes in travel that move us closer to the teleportation extreme. As lower-cost, higher-speed travel alternatives become available, will individuals take advantage of these improvements to travel the same distances but at less time and lower cost? To the

contrary, some aggregate studies indicate that people increase the amount they travel under such circumstances (Bieber et al., 1994; Chlond and Zumkeller, 1997), although at least one disaggregate study (Kitamura et al., 1997) reported that only 3.6% of a 10-min savings in travel time would be spent on additional travel.

6.2. TTB, or not TTB? That is the question

The idea that, when travel becomes faster, people will travel longer distances in the same amount of time rather than equal distances in less time is consistent with the theory of a constant TTB (Hupkes, 1982; Marchetti, 1994; Zahavi and Talvitie, 1980). Some researchers (Goodwin, 1981; Gunn, 1981) have questioned this theory, citing the relative variability in daily travel times at the disaggregate level. We believe that the empirical evidence on both sides of this debate may fit a modified version of the TTB theory, grounded in the considerations presented here.

Specifically, we hypothesize the existence of an unobserved desired level of mobility, that varies both across individuals (as a function not only of the demographic characteristics usually used to model TTBs at the disaggregate level, but also of the travel-related attitudes and personality traits described in this paper), and within the same individual across time. Rather than uniformly trying to minimize travel, people seek to decrease their travel if it exceeds the desired optimum, but seek to increase travel if it falls short of their ideal amount.

Previous work (Mokhtarian et al., 1997) has classified potential individual responses to congestion as travel-maintaining, travel-reducing, or long-term lifestyle/location changes (assumed to reduce travel). But even areawide congestion will not impact every individual to the same degree, and we further suggest that even an individual who faces congestion may still wish to increase travel (although not necessarily at peak periods). Thus, it would be fruitful to consider responses to dissatisfaction with travel time in *either* direction, and extend the types of responses analyzed to travel-increasing strategies as well, including relocations that result in longer trips for work and non-work purposes than before. Again, the challenge is to distinguish the extent to which such strategies are adopted for reasons other than an intrinsic utility for travel (e.g., because the greater attractiveness of the new location outweighs the negative utility of the increased travel).

From the perspective of this paper, the TTB becomes an unobserved, variable ideal toward which people strive rather than an observed, stable quantity. The instinct that the demand for travel is not purely derived may account for the persistent appeal within the profession of the concept of the TTB. The empirical regularities that have been found may be due to the fact that, at the aggregate level, fluctuations on either side of the ideal will tend to cancel. On the other hand, the possibility that desired mobility both varies as a function of seldom-measured internal characteristics, and is not always achieved due to constraints, can account for the lack of stability that is often found at more micro-scales of analysis.

If there is a "desired TTB", it is useful to measure what that budget is. It is also difficult to do so: a direct question is unlikely to elicit a reliable response, at least for travel time in total. One specific context in which the direct question may obtain useful answers is for the repetitive and familiar case of commuting: the ideal commute time discussed in Section 5.6 is in fact a subset of an individual's desired TTB. That question on our survey appears to have produced meaningful and interesting results, notably that the desired commute time is greater than 0 for nearly the entire sample (see also Redmond and Mokhtarian, 1999).

We did not otherwise attempt to measure a desired TTB in minutes per day. Instead, following Ramon (1981), we obtained measures that she referred to as travel satisfaction, and that we now refer to as relative desired mobility. Specifically, our survey asked how much respondents would like to travel compared to what they do now, with a five-point response scale ranging from "much less" to "much more". As with the travel liking question, the relative desired mobility question was asked separately for short distance and long distance, and within those two categories it was asked "overall", and by purpose and mode. The results are shown in Fig. 6.

The numbers following each label in the legend of the figure are the correlations of each variable with its travel liking counterpart in Fig. 2. As might be expected, the correlations are positive and strongly significant, ranging from 0.3 to 0.6. One implication is that the analysis of travel affinity in Section 5.2 roughly applies to relative desired mobility as well. Another implication is that the more a person likes to travel in a particular category, the more he wants to increase his travel in that category – even without controlling for how much he already is traveling.

Further study of these data will undertake more sophisticated analysis of the relationships among travel liking, objective, perceived, and relative desired mobility, together with the attitudinal, personality, lifestyle, and demographic variables measured by the survey. The key point at this stage is that the results do lend some support to the concept of a desired TTB, with respondents indicating a number of circumstances under which they want to maintain or increase the travel they are doing now. If travel were purely a derived demand, we would expect a much

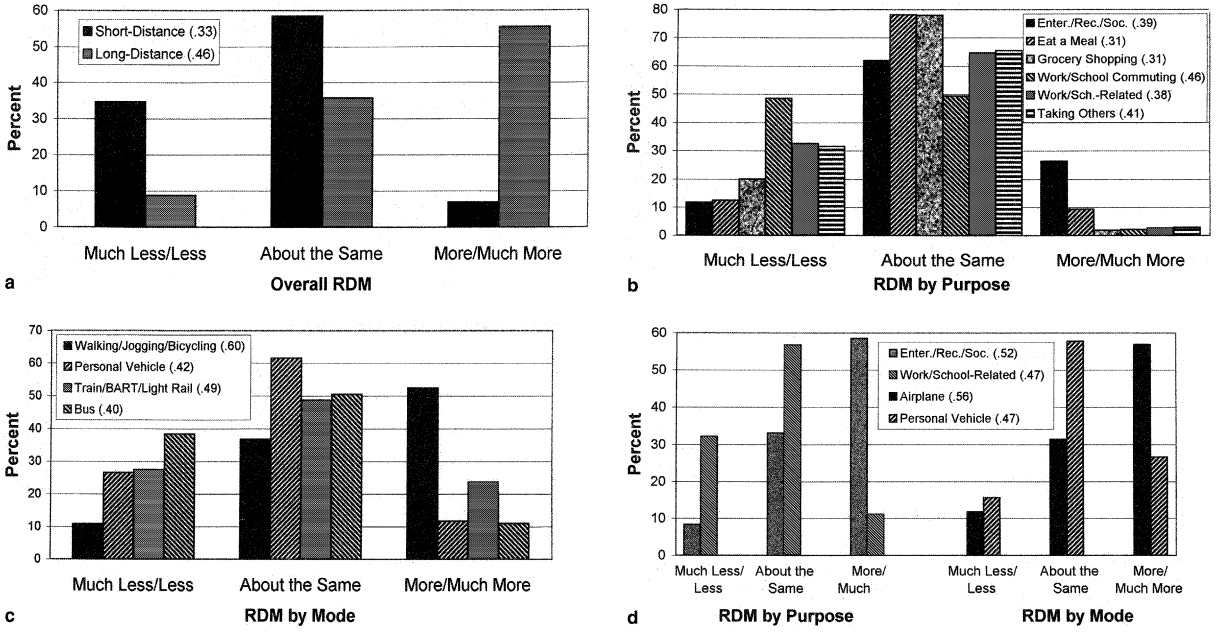

Fig. 6. (a) Overall relative desired mobility by distance category ($N = 1904$). (b) Relative desired mobility for short-distance travel by purpose ($N = 1904$). (c) Relative desired mobility for short-distance travel by mode ($N = 1904$). (d) Relative desired mobility for long-distance travel by purpose and mode ($N = 1904$). The numbers following each label in the legends are the correlations of each relative desired mobility variable with its travel liking counterpart in Fig. 2.

more universal desire to decrease it. Even if respondents are partially confounding the travel itself with the benefits of being at the destination, these results at a minimum point to substantial latent demand for those benefits, and hence for the travel required to achieve them. However, future studies should more carefully attempt to distinguish the respondent's desire to travel in order to engage in certain kinds of activities from his desire to travel for its own sake, perhaps through application of some form of the teleportation test.

6.3. Alternatives to a travel–activity combination

Applying the teleportation test leads naturally to an examination of alternatives within an individual's choice set. Understanding the choice set is crucial to modelling or predicting a behavioral response (Genç, 1994; Thill, 1992). That is, to be able to predict a choice, we need some knowledge of the competing alternatives. In particular, for policy reasons we are interested in identifying non-travel or lower-travel alternatives that may appeal to an individual.

A person's logical alternatives differ depending on the source of her utility. Consider each of the three elements of Section 4 in turn. Again, for simplicity we discuss each case as if it were "pure", but in reality the utility for a particular travel–activity combination may be composed of all three elements to varying degrees. Hence, all three elements should be considered in identifying alternatives in a specific choice context, and in evaluating the individual's utility for each alternative.

When utility is based entirely on the activities conducted at the destination, the scenario resolves to a conventional activity/destination choice. In the absence of a teleportation alternative that would potentially render network congestion moot (but may in fact result in considerable "point" congestion at desirable locations), a typical policy action to reduce congestion is to bring origins and destinations closer together through land use planning, or to promote the adoption of ICT-based activities that do not require travel. Such policies should be effective (1) if the individual derives little or no utility from the other two elements, and (2) if the utility of the nearer destination or the ICT alternative is similar to that of the original alternative. Such policies will be less effective than expected if either condition fails. The first condition fails if the other two sources of utility are important to the individual but overlooked by the policymaker, as this paper contends may be the case more often than we realize. The second condition fails if the reduction in travel for the nearer destination (or the no-travel ICT alternative) is more than outweighed by the lower attractiveness of the nearer destination. Thus, for example, placing a small food market within walking distance of a residential neighborhood may not eliminate auto trips to a more distant supermarket with larger variety and lower prices. Telecommuting from home may be less attractive for some than working at a conventional location because the need for human interaction or visibility to management may outweigh the disutility of the commute.

When utility is derived from activities conducted while traveling, the question becomes, how easy or likely is it to conduct those same activities in connection with a non-travel or lower-travel alternative? If the answer is "not very", the individual may still prefer the higher-travel alternative for its multitasking opportunity. For example, suppose a "carcooner" highly values the opportunity of listening to his favorite music at elevated decibel levels during the daily commute. Telecommuting may not offer an equivalent utility if the presence of others in the household prohibits exercising that particular proclivity at home. The traveler who values the opportunity to think or read while traveling may recognize that without the enforced physical idleness and

isolation of traveling, those activities would be crowded out by competing demands for attention. It can be noted in passing that the Intelligent Transportation Systems goal of vehicle automation will have the effect of conferring some of the "category 2 appeal" currently characteristic of public means of transportation (that is, the opportunity to conduct other activities while traveling without having to operate a vehicle) onto the personal automobile, thus further increasing the attractiveness of auto relative to transit for some. For others, however, surrendering control of their vehicle might materially diminish the utility of driving.

When utility is drawn from the activity of traveling itself, it is possible to identify non-travel alternatives that may offer a similar experience. The characteristics described earlier – the sensation of speed, the experience of and movement through the environment, operational skill, scenic beauty – can all be simulated through various applications of virtual reality. Driving or flight simulators can provide an increasingly realistic operational experience. Multimedia tours of museums and scenic attractions are increasingly available on the Internet. The question is, will these ersatz alternatives be as satisfactory as the real thing? Clearly, there may be situations in which constraints such as cost, time, or physical ability have the result that the utility of the virtual alternative exceeds that of the real one. But it seems probable that for many people under many circumstances, the real thing will continue to have an edge no matter how realistic the virtual alternatives become (Kenner, 1998). Indeed, the possibility cannot be overlooked that the growing reality and pervasive availability of virtual alternatives may increasingly stimulate the appetite of society in the aggregate for the real thing. If that is true, then the closer we get to teleportation (that is, the faster and cheaper travel becomes), the more local congestion is likely to escalate in especially desirable locations and along especially desirable/scenic routes. Already, our ability to offer ecologically sustainable tourism opportunities, in an era of rising global prosperity and hence rising demands on fragile environments, is a matter of serious concern (see, e.g., Williams, 1998).

7. Summary and conclusions

This paper contests the conventional wisdom that travel is a derived demand, at least as an absolute. We do not dispute the principle that most travel is derivative, but we also argue that humans possess an intrinsic desire to travel, a point previously made by a number of researchers in a variety of disciplines and geographic locations. We discuss the phenomenon of undirected travel – cases in which travel is not a byproduct of the activity but itself constitutes the activity. We note that while undirected travel is predominantly a leisure activity, it is relevant to our understanding of directed travel as well. For example, the same reasons why people enjoy undirected travel (a sense of speed, motion, control, enjoyment of beauty) may motivate them to undertake excess travel even in the context of mandatory or maintenance trips.

One characteristic of undirected travel is that the destination is ancillary to the travel rather than the converse which is usually assumed. We argue that the destination may be more or less ancillary more often than is realized. The paradigm of travel as a derived demand requires that we view the destination/activity as generating the trip, when on some occasions it may be the desire to travel that prompts the invention of a spatially-removed activity to satisfy that desire. It is impossible to distinguish those opposite directions of causality without further insight into attitudes toward traveling.

The share of total travel that is completely undirected is presumably relatively small, although we do not know how small because travel/activity/time use diaries are likely to classify such travel (sailing, skiing, etc.) as a leisure activity rather than as undirected travel. However, it is theoretically straightforward to modify standard data collection instruments to make that distinction, if it is deemed worth doing. It is not at all straightforward to identify the extent of excess travel undertaken in connection with destination-oriented activities, including mandatory and maintenance ones. The total is probably still small, but it may be large enough to matter at some level, and it may also be growing (as a function of improving economic conditions worldwide).

Even if the amount of excess travel is small, it is important to clarify our understanding of individuals' basic motivation to travel. If travel has a positive utility to some extent, it is desirable to develop ways to measure the extent and circumstances for which that is true. But in self-reports of attitudes toward travel, respondents are likely to confound their utility for traveling itself with their utility for the activities conducted at the destination and for activities conducted while traveling. Despite this measurement challenge, preliminary empirical results from a study of more than 1900 residents of the San Francisco Bay Area provide suggestive evidence of a positive utility for travel. For example, more than three-quarters of the sample reported sometimes or often traveling "just for the fun of it". More than two-thirds disagreed that "the only good thing about traveling is arriving at your destination".

Instead of the constant (observed) TTB favored by some transportation analysts, we hypothesize the existence of an unobserved desired TTB, which varies by attitudes, personality traits, demographic variables, mode, and purpose. The individual's ideal commute time is a subset of this desired TTB; the average ideal one-way commute time in our sample was 16 min. Measures of relative desired mobility (the amount an individual wants to travel compared to the present) identified a variety of circumstances under which our respondents wanted to maintain or increase their travel.

With the current data collection instrument, we are only imperfectly able to distinguish the three components of a utility for travel mentioned above. For example, our measurements of travel affinity, ideal commute time, and relative desired mobility probably confound all three elements. However, future analyses of the data will focus on modelling these variables as functions of other indicators of the presence of each of those three elements. Doing so will help identify the extent to which each element influences the dependent variable. It would also be desirable to search for segments within the sample who weight the three elements differently. These initial results and further analyses of these data will provide valuable insight into the desire to travel, and will point the way to refinement of future data collection instruments having similar goals.

The concepts presented here may raise some questions about the current practice of transportation planning. For example, one might ask whether, if people are not time-or cost-minimizers when it comes to travel, using travel time savings as a basis for valuing capacity enhancements is valid. Our results do not necessarily point to discarding that approach (although other legitimate concerns have been expressed in this regard, especially about the practice of monetizing time savings; see, e.g., Atkins, 1984; Calfee and Winston, 1998; Welch and Williams, 1997). Suppose people do have a non-zero desired TTB. Then, first, many people will be exceeding that desired budget, and even though they would not want to eliminate all time spent traveling, they still want to reduce the time they are currently spending. Second, even those people who are currently traveling their desired amount probably want to minimize their exposure to congested

travel conditions. Hence, they would value a capacity enhancement that reduced the time they spend in congestion – even if they then allocated that time savings to additional travel in order to fill up their desired budget. All things considered, then, travel time savings probably still serve as a useful, measurable proxy for the theoretically superior but nebulous and impracticable "increase in utility" that is the real measure of traveler benefit.

On the other hand, it may be productive to pursue a more nuanced approach toward the treatment of travel time in regional modelling. The literature has already identified considerable variation in the monetary value of travel time by characteristics of the trip and the traveler. Mode choice models typically differentiate between in-vehicle travel time and out-of-vehicle travel time, with the latter considered more onerous (and therefore having a more negative coefficient in the utility function). Hupkes (1982) takes this a step farther by distinguishing the "derived" component of travel utility from its "intrinsic" component, and suggesting that both of them initially rise with travel time (at different rates), and then fall after the point that is optimal for each component. Under this conceptualization, travel time would not always be assumed to have a negative impact on utility (as is currently the case even for those studies that identify different coefficients of travel time under different circumstances); rather a non-linear function is obtained, containing a segment over which the net impact of travel time on utility is positive.

In sum, the issues raised here have important implications for transportation planning in general and travel demand analysis in particular. The way people will react to policies intended to reduce vehicle travel will depend in part on the relative weights they assign to these three components of a positive utility for travel, and on whether they desire more or less mobility than they currently experience. Only in cases in which the positive utility derives completely from the activities conducted at the destination will a lower-travel alternative be preferred, *ceteris paribus*. Although non-travel alternatives are available that may partially satisfy each of the three components of utility, those alternatives will often not be as desirable as traveling. Ultimately, improving our forecasts of travel behavior may require viewing travel literally as a "good" as well as a "bad" (a disutility), and modelling the demand for that good as we do for other goods. As we have seen, the demand for travel is a function of fundamental human characteristics as well as the external variables typically measured, and those relationships need to be understood much better than we do at present.

Acknowledgements

This work is funded by the University of California Transportation Center and the Daimler-Chrysler Corporation. Michael Bagley provided early input to the survey design. Lothlorien Redmond has done an outstanding job of managing the survey design and production, and has carefully overseen the data collection, entry, cleaning, and analysis to date. She has been recently assisted by Richard Curry, who also prepared the graphics for this paper. Naomi Otsuka has ably and intelligently assisted with data entry and cleaning, and literature searches. Some of the ideas presented in this paper have been sharpened by discussion with participants at the European Science Foundation/National Science Foundation conference on Social Change and Sustainable Transport, Berkeley, CA, 10-13 March 1999, and by discussions with Qiuzi (Cynthia) Chen and Hani Mahmassani. Insightful comments from Rick, Lorien, Naomi, two referees, and Associate Editor Yossi Berechman were most helpful in improving earlier drafts.

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