What Do Passengers Do During Travel Time? Structured Observations on Buses and Trains

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Abstract

Structured observation is one way to assess how public transport passengers actually use their travel time. This study reports on 812 adult passengers in Wellington, New Zealand. Researchers recorded passenger characteristics and behavior over a 4-minute period, on a range of routes and times, using 12 pre-set codes. Most passengers (65.3%) were "looking ahead/out the window" at some point in the observation period, more on buses than on trains. About one-fifth of all passengers observed were seen reading, more on trains. Other activities included listening on headphones, talking, texting, and sleeping/eyes closed. Activities were compared on the basis of gender, age group, mode, and time of day. Comparisons are made with recent observational and survey studies, with discussion of both methods and results.

Introduction

This article discusses structured observation as a method to assess what people do during their public transport travel time and reports on a study of bus and train passengers in New Zealand. Particular attention is given to some methodological

challenges of data collection on public transport, and methods and results are compared with other observational studies.

The standard way travel time is valued in transport appraisal, through valuation of travel time savings (essentially, travel time is treated as wasted time), provides the overall context for this research (Wardman 1998; Mackie, Jara-Díaz et al. 2001; Wardman 2001; Hensher 2001a; Hensher 2001b; Mokhtarian 2005; Metz 2008). The study reported here does not engage with the monetary valuation of travel time; it is a social and not an economic study. The lead researcher's Ph.D. research investigates how public transport passengers use and value their travel time and its impact on health and well-being. As a preliminary investigation, observations of bus and train passengers were undertaken in the Wellington area during November-December 2008.

Ways of Observing Passengers

There is little in the transport literature about observation of passengers during travel as a method. Clifton and Handy (2001) pointed out that participant observation "has not often been used in travel behaviour research, but it has a rich tradition in studies of behaviour in urban space" (Clifton and Handy 2001). Observation is not appropriate if we seek to know what passengers are thinking or feeling, of course; it can be used only to assess manifest behavior. Further, observed behavior cannot often be interpreted: for example, a person reading a novel could be doing so for leisure or for study, or even for work.

Several useful ethnographic observational studies of passengers have been carried out (Nash 1975; Delannay 2001; Fink 2006; Watts 2008; Jain 2009). That method, however, would not yield information about the range of activities among large numbers of bus and train passengers or show which behaviors were more common and how they were shared across different population groups and different modes.

Naturalistic observation is assumed to "not interfere with the people or activities under observation" (Angrosino 2005) and people "are free to vary their individual and social responses" (Sackett, Ruppenthal et al. 1978). Still, "people may behave quite differently when they know they are being observed versus how they behave naturally when they don't think they are being observed" (Patton 2002).

To systematically observe passengers in a completely covert way, a hidden video camera might be used. But there are methodological and cost reasons, as well as the more compelling ethical arguments, against this approach (Sackett 1978).

Structured observation is a "way of quantifying behaviour" (Robson 1993) as it "focuses on the frequency of … actions" (Gray 2004) and "employs explicitly formulated rules for the observation and recording of behaviour" (Bryman 2008). Unlike ethnographic studies, it produces quantitative data. The coding scheme and observation schedule are central to the method. At the time of the research, the team had not seen studies elsewhere using this method with passengers. Three reports since came to attention: Ohmori and Harata (2008), Timmermans and Van der Waerden (2008), and Thomas (2009). Comments on these studies, below, include remarks about methodology and data collection protocols.

Timmermans and Van der Waerden (2008) discussed the advantages and disadvantages of observation as opposed to surveys, diaries, and similar self-reports, which are common in time-use research. While self-reports may be useful and reliable for most activities and appropriate for questions about how people spend their time at home where observation is not feasible, travel activities may be rather different. Short-duration or non-routine activities while traveling may be especially subject to poor recall. Observation is economical and unobtrusive and yields a lot of fairly reliable data in a short time.

Problems with structured observation as a method may arise when there is more than one observer, in the degree of agreement between the observations (inter-rater reliability); but having more than one observer is desirable as reliability can be checked. An observer's attention may flag (affecting intra-rater reliability), or the consistency of observations over time by each observer may change (Martin and Bateson 2007). Hence "observer drift" (Robson 1993), "observer fatigue" (Martin and Bateson 2007) or "observer decay" (Hollenbeck 1978) are of concern. The ethnographer Watts (2008) described the challenge of maintaining the observer's role and location as a researcher.

Observational and Survey Studies of Passengers

In their study of 161 passengers on San Francisco trains, Timmermans and Van der Waerden (2008) found almost all were "doing nothing." Although this was a pilot study (Timmermans and Van der Waerden 2008) and the sample size was too small to detect significant effects, the authors reported differences in activities: "doing

nothing, sleeping, talking, reading and [listening to] music" by socio-demographic and contextual variables: gender, race, age, travel party (alone, couple or group), trip duration, and time of day. That almost all of the people observed were "doing nothing" "casts doubt on the prevalence of multitasking while travelling on trains, at least for this sample, which concerned travelling for relatively short distances" (Timmermans and Van der Waerden 2008).

Other activities discussed were sleeping (more common among women and non-Caucasians and in the morning commute, less common among 18-25 year olds, and almost half of the sample) and talking (more common among women and Caucasians).

A Japanese study by Ohmori and Harata (2008) included an observation of 84 and a survey of 503 passengers on "normal" and "high grade" trains. The observations showed sleeping and reading as the most frequent activities; sleeping was at a high rate (67%). But the observation study did not appear to include a "doing nothing" category. The ensuing survey evidently did have such a category, however, and a quarter to a third of passengers reported "thinking of something" for work or leisure. Some activities differed by trip length: the longer the trip, the more likely passengers were to be sleeping or reading, especially if they had a seat. Not having a seat did not prevent sleeping, though.

Thomas's recent New Zealand study (2009) included observations of 1,703 passengers on Wellington buses and trains. Thomas was not examining the range of behaviors *per se* but looked at passenger characteristics, seat selection, movement within the vehicle, verbal interaction, and "defensive behaviors," in which category he included listening to music, reading, etc. (Thomas 2009). Results showed that about a quarter of passengers had verbal interactions, and a quarter engaged in activities, the most common being reading/writing (11% of the total sample) and listening to music (9%).

In a large British survey (N=26,221 train passengers) about different activities while traveling, reading for leisure (34%), window gazing/people watching (18%), and working/studying (13%) were the frequent activities reported by passengers (Watts and Urry 2008). For British passengers, unlike those in the U.S. observational study, sleeping/snoozing happened more on the "return" journey (Lyons and Chatterjee 2008). Window-gazing was high on short journeys (Lyons, Jain et al. 2007), and the authors suggest there may be "a possible travel duration threshold below which there is not a suitable amount of time to do other than window gaze/people watch" (Lyons, Jain et al. 2007).

In Norway, Gripsrud and Hjorthol's (2009) train survey (N=1196) found well over a third of passengers using travel time for work, with nearly a quarter of commuters having their travel time paid as work time.

Aim

The aim of this study was to assess the frequency of passenger activities during bus and train travel using structured observations of passengers in a purposive sample of bus and train routes and times in the Wellington area.

Method

Observing Passengers in Wellington: The Setting

Car ownership is high in New Zealand (2,306,921 cars in a population of under 4.2 million in 2009) (New Zealand Transport Agency 2010), but public transport also is used. In Wellington, 17 percent of residents used buses, trains, and harbour ferries to get to work in 2006, with about twice as many trips by bus as by train (Metlink). In New Zealand overall, about 5 percent of all travel time is on a bus or train (Ministry of Transport 2008). Wellington, the capital city, is set mostly on hills around a harbor.

There is only one class of carriage on any train route in New Zealand; except for the long-distance trains, those in Wellington were old and noisy. The train system was neglected and run-down in the 1990s. Replacement rolling stock is expected from 2011 (Greater Wellington Regional Council 2010). The most comfortable and well-equipped train observed was on the two-hour commuter trip between Wellington and Palmerston North, with power-points for computer connections; tables or trays; comfortable, well-padded seats; and food and drink available (the only service observed with such facilities). The buses in Wellington include older and newer vehicles. They are single-deckers and run either by overhead trolleys or diesel.

Sample

A purposive sample of bus and train routes and times was selected. Purposive sampling is a type of non-probability sampling that provides for a "strategic" sample (Bryman 2008). Bus and train routes selected were short (20-minute) or long (up to 2-hour) distances, downtown and suburban routes, encompassing wealthier and poorer areas (according to the NZ Index of Deprivation, Salmond, Crampton et al. 2007) and included routes where passengers had a clear choice of bus or train

mode. Observations also were made opportunistically, e.g., while en route by bus to the Wellington railway station to begin collecting train data.

Both morning (before 9.00 AM) and evening (3.00 PM to 6.30 PM) peak commuting times (New Zealand Transport Agency 2008) were included for observations, as were several night and midday times.

Data Collection

Public transport providers were contacted to explain the research, including Go Wellington (a bus company owned by Infratil) and KiwiRail (the recently re-nationalized provider of local Tranz Metro rail services). The managers of both operations generously provided free passes for the two researchers and a covering letter of support. The two researchers worked together for safety reasons and avoided late night trips.

Developing a reliable and workable way to gather data was the most challenging aspect of this research. Some of the issues are described below and compared with methods described in other research reports.

Who and What to Observe: Passenger Types and Activity Categories

The coding scheme for structured observations is very important—exactly what and who will be observed? Interestingly, there was considerable accord between the categories of train passenger activities used in studies in Japan (using observation and a self-report survey) (Ohmori and Harata 2008), the U.S. (using observation only) (Timmermans and Van der Waerden 2008), and New Zealand (Thomas 2009) and those from two surveys (*not* observational studies) in Great Britain (Lyons, Jain et al. 2007) and Norway (Gripsrud and Hjorthol 2009). Of these, only the British study was available the schedule was designed. The activity categories were worded with subtle differences, e.g., the activity called "window gazing/people watching" in the British study (Lyons, Jain et al. 2007) is called "seeing advertisements, scenery and people" by Ohmori and Harata (2008). In addition, categories may reflect different cultural practices (the Japanese study includes "singing" as an activity) and varying national regulatory differences (for example, about smoking). Table 1 lists the activity categories used by six studies.

Gender, race and age of passengers were noted by Timmermans and Van der Waerden (2008). In the observational part of their study, Ohmori and Harata

Table 1. Activity Categories in Studies from Japan, U.S., UK, Norway, and New Zealand

Passenger Activity Categories	Ohmori & Harata (2008)	Timmermans & Vander Waerden (2008)	Lyons et al. (2007)	Gripsrud & Hjorthol (2009)	Thomas (2009)	Russell et al. (present study)
Reading for leisure/ newspaper/book/etc.	*	*	*	*	*	*
Talking to other passengers socially	*	*	*	*	*	*
Sleeping/snoozing	*	*	*	*	*	*
Listening to music/radio	*	*	*	*	*	*
Window gazing/watching people, advertisements, scenery	*		*	*		*
Working/studying			*	*		
Talking on phone	*	*	*	*	*	*
Text messaging	*	*	*	*	*	*
Nothing/staring ahead		*				*
Personal care		*				
Work computer		*			*	*
Game (various)		*	*			
Romancing		*				
Eating/drinking	*		*			*
Smoking cigarettes	*					
Singing songs	*					
Thinking	*		*	*		
Using PC/PDA, playing video game, watching video	*		*	*		
Care of children			*	*		
Knitting, needlework				*	*	
Writing					*	*
Handling wallet, equipment, etc.						*
Being bored			*			
Being anxious about the journey			*			
Planning onward or return journey			*			
Other (describe)				*		*

(2008) seem not to have noted passenger characteristics. Thomas (2009) noted gender and age group.

In deciding what to observe in the New Zealand study, we used our own and advisors' local knowledge and noted some of the items from Gray's list of high-level "features of social situations as a basis for observational data sources" (Gray 2004). Categories were developed, based on Lyons et al.'s work, but we added the category "handling wallet, equipment, etc." after a pilot study, having observed people rummaging in their bag, wallet, or purse apparently rearranging, examining, or stashing objects. As the list was plainly not exhaustive, we also added the category "Other (describe)."

In the study, only adults were observed. Gender and broad age group were noted (young = about 18 to 30-35; middle age = 35 to 60; older = over 60). In New Zealand, it is considered inappropriate to guess at people's ethnicity, which is constructed as meaningful only through self-identification (Statistics New Zealand 2005), so race or ethnicity were not included.

How to Observe: Field Work

There are many ways to conduct observations of passengers, as the literature shows. It was initially intended that two researchers sit or stand together on the public transport vehicle, then, at an agreed time and beginning with the same passenger, separately observe and record (using pen and paper) all the passengers in the vehicle. For each passenger, their general age range and their gender would be noted, as would whether or not they appeared to be a "single" or a "with" (meaning "with other people" [Goffman 1963]) and what they were doing. This is the general method described by Timmermans and Van der Waerden (2008) and similar to that used by Thomas (2009).

During the pilot period, the proposed method was found to be unworkable, even after repeated attempts. First, the buses, even when half full, were very busy with people getting on or off at stops every few minutes, and researchers' note-taking could not keep up. Second, there was a marked lack of inter-rater agreement on a range of points, but particularly about passengers' age group. An age gap of 32 years between the two observers probably contributed to this divergence. Third, in a crowded vehicle, the researchers could not see all of the passengers or had a partial view only. This was even more challenging in long train carriages (seating over 70).

Observing Passengers Over Time

Aware from the pilot that people varied their activities over time, and on suggestion from advisors, the researchers elected to observe individuals five times over a period of four minutes, noting passenger characteristics beforehand, and then, once per minute, viewing the passenger and immediately recording what the passenger was doing at that instant. Martin and Bateson (1986) call this approach "instantaneous sampling," "point sampling," or "fixed interval time point sampling"; they also advise on choosing the sample interval. The length of time for observing each passenger (four minutes) allowed us to record some of the variability in behavior and was long enough to obtain a large amount of data. However, it was not so long that many passengers were lost to observation in the frequent, busy movement of people on and off buses in particular.

Thomas (2009) appeared to observe all the passengers who boarded the vehicle (behavior sampling). Ohmori and Harata's observer recorded six to eight passengers' activities every minute (Ohmori and Harata 2008). Our study showed a researcher can comfortably observe two people at a time. More than two passengers at a time would be feasible in our view, but we think eight per minute would be demanding. The two-passengers, four-minutes, five-observations protocol was appropriate to elicit a large amount of data and gave as broad a sample as possible within the time and research resources available.

Each of the observers, taking one side of a vehicle, usually selected the passengers nearest to her, but also bore in mind a wish to observe roughly equal numbers of men and women, and sometimes individuals were purposefully selected on the basis of gender.

There were still difficulties, as, for example, when passengers boarded and stood in the aisle at peak times, completely blocking the researchers' view of passengers already under observation. One of the observers noticed that even if the observer could not see the passenger directly, bus and train windows had reflecting glass, which, especially at night, was useful in reflecting adequately what passengers were doing.

An attempt was made to address observer fatigue by taking breaks and ending a session when the researchers were tired. On the basis of this experience, a half-hour break after two hours is recommended for this kind of work, as well as doing no more than five hours of observations at a time.

During the four-minute observation period, a passenger might be recorded as carrying out only one or more than one activity at a time (multitasking), for example, reading a book while wearing headphones or texting while eating. In addition, a passenger might undertake several different activities sequentially over the observation period, for example, reading at Times 1 and 2, talking at Time 3, and texting at Times 4 and 5. Or a passenger might have alighted after two minutes. To accommodate this diversity, the data analysis refers to the numbers of passengers who were "ever observed" doing the activity. A passenger reported as "ever-texting" may have been reading at four of the times she was observed and texting only at the fifth, or eating while texting.

An effect of the "ever observed" approach may be to inflate some of the data. For example, in virtually every journey, a passenger is likely to look ahead or out the window at some point, and our method may count this activity more than its duration in reality would suggest. Results around this, therefore, could be an artefact of the method. Another category where a behavior is so integral a part of the journey that it may be distorted in the study is the handling of a wallet or purse. This is especially the case where passengers have a ticket clipped or pay cash in exchange for a paper ticket, thus handling their wallet or purse, removing money, or stowing a clipped ticket. Note, however, that many passengers in Wellington on both buses and trains show a pre-paid token and do not present cash or require change.

The differences in methods, as well as cultural and other differences in the studies from the U.S. and Japan, render the comparison of results unhelpful, but the Wellington study by Thomas is of considerable interest. Thomas did not fully explain his method, but it included, for most of his observations, one person observing all the passengers boarding a bus or one half of a train carriage, noting any subsequent seat changes and departure, gender, age, couple relations, seat location(s) and patterns, as well as activities such as verbal interaction, bag placement, and activities (reading, headphones, etc). Without greater detail than is given in his thesis, it is difficult to know exactly how this was accomplished but since he observed 1,142 bus passengers on 38 trips, an average of 30 people observed per trip; on trains, the average would be 24 people per trip. Hence, different results between Thomas's and the current study may arise from the different methods used.

Table 2 compares the observational studies reported by Timmermans and Van der Waerden (2008), Ohmori and Harata (2008), Thomas (2009), and the current study.

Table 2. Comparison of Scope of Four Observational Studies

	Timmermans & Van der Waerden (2008)	Ohmori & Harata (2008)	Thomas (2009)	Russell et al. (present study)
Area	San Francisco, U.S.	Tokyo Metropolitan Region, Japan	Wellington Region, New Zealand	Wellington Region, New Zealand
Mode	Train	Train	Train and bus	Train and bus
Vehicles and Routes	Bay Area Rapid Transport; line not specified; both directions	Odakyu Support #60, from Machida to Shinjuku on Odakyu Odawara line	Randomly selected bus service numbers; 4 train lines	5 bus routes 4 train routes
Time Period	1 day in June 2007; early morning peak, middle of the day and early evening commute	11 weekdays in November-December 2003; morning commute trips: 0630 AM to 0704 AM	8 weekdays in winter; 38 trips (bus), 23 trips (train); 0630 AM to 0600 PM	9 weekdays in November-December 2008; 24 trips (bus) 22 trips (train); early morning from 0700 AM; mid-late morning, early evening, night (to 1000 PM)
Method	Observer used layout map of carriage to record each passenger in sequence; passenger age, gender, race and activities; what station they got on and off; activities after each of the frequent stops; new passengers getting on were added and recorded	Observer recorded activities of only 6-8 passengers simultaneously every 1 minute from start to end of route	1 observer except for observations of n=31; train carriages treated as 2 for convenience; observer placed to view passengers boarding, sequentially recorded each passenger movement, gender, age, seat location, who sat next to, couple/single, defensive behaviors, vehicle percent full, weather, interpersonal distance	2 observers in each bus/carriage or separate carriages if few passengers; each took one side of the bus/carriage; selected 2 nearest visible adult passengers; recorded gender, age; activities once every minute for 4 minutes (5 times); then selected next 2 passengers; attempt to select approx. equal numbers of men and women; noted weather
People Observed	161	84	1,703 Buses: 1,142; Trains: 561	812 Buses: 353; Trains: 459

Analysis

Data were entered into Excel and analyzed in SPSS. Bus and train data were amalgamated to produce a single dataset, and the five time intervals were listed in a single column for analytical purposes. Computation of descriptive statistics using SPSS was carried out, followed by binary logistic regression analysis for the association of observed activity against the covariates (gender, approximate age group, transport mode, and peak/off-peak travel time). Odds ratios from the logistic regression are reported to examine the relationship between the covariates and each activity. A critical P-value of .05 and 95% confidence intervals were included to test for significance.

Results

Age and Gender of Passengers Observed

Table 3 shows the age-groups and genders of passengers by mode. Although no formal inter-rater reliability check was made, a lack of agreement about passengers' age was noted during informal checking: the reliability of coding in the "middle-age" and "older" groups is doubtful. From a cursory view, there seemed much better agreement about the "young" assessments (people age about 18 to 30-35) than about the middle-age group (35 to 60 years) and the older group (over 60). Accordingly, a conservative approach was taken in the statistical analysis: the middle-age and older groups were combined, providing a comparison between these and younger passengers.

Activities: How Did Passengers Spend Their Travel Time?

Table 4 shows the number and percentage of passengers observed doing different activities on buses and trains. The most striking result shown here is that nearly two-thirds of the passengers observed spent some of their travel time looking ahead or out the window (65.3%), but this was seen more on the bus (76.5% of bus passengers) than on the train, where just over half of train passengers (56.6%) were looking ahead or out at some point during the observation. About a fifth of the passengers were observed reading (21.7% overall), with more than twice the proportion seen reading on the train (28.8%) than on the bus (12.5%). A similar proportion was seen with headphones on (20.9% of train passengers and 17% of bus passengers). Slightly more people were observed talking to other passengers on the train (16.8%) than on the bus (13.6%). Texting was more commonly observed (9.2% of all passengers) than talking on a cell phone (1.5%). Activities observed more frequently on trains than on buses were reading, using a computer, sleeping/eyes closed, writing, and handling wallet, bag, etc. Writing included using a pen or pencil to work on crosswords or puzzles as well as writing in notebooks or on printed sheets.

Table 3. Age Group and Gender of Passengers Observed on Buses and Trains (N=812)

	Buses		Trains		Total Passengers	
	Count	*% of Total Sample*	*Count*	*% of Total Sample*	*Count*	*% of Total Sample*
Women						
Young	76	9.4	88	10.8	164	20.2
Middle-Age	72	8.9	126	15.5	198	24.4
Older	23	2.8	17	2.1	40	5.0
Totals	171	21.0	231	28.4	402	49.5
Men						
Young	77	9.5	61	7.5	138	17.0
Middle-Age	82	10.0	119	14.7	201	24.8
Older	23	2.8	48	5.9	71	8.7
Totals	182	22.4	228	28.1	410	50.5
Total	**353**	**43.4**	**459**	**56.6**	**812**	**100**

Table 4. Ever-Observed Activities on Bus and Train (N=812)

Activities	Bus		Train		Total	
	Number	*% of Total Sample*	*Number*	*% of Total Sample*	*Number*	*% of Total Sample*
Looking ahead/out window	270	76.5	260	56.6	530	65.3
Reading	44	12.5	132	28.8	176	21.7
Headphones in	60	17	96	20.9	156	19.2
Talking	48	13.6	77	16.8	125	15.4
Texting	29	8.2	46	10	75	9.2
Sleeping/eyes closed	15	4.2	57	12.4	72	8.9
Handling wallet, etc.	16	4.5	42	9.2	58	7.1
Other	15	4.2	28	6.1	43	5.3
Eating/drinking	13	3.7	25	5.4	38	4.7
Using computer	1	0.3	34	7.4	35	4.3
Writing	4	1.1	22	4.8	26	3.2
On phone	6	1.7	6	1.3	12	1.5

The observers could not always tell if two people talking together were acquainted before getting on the bus or train, although, in some cases, it was clear from behavior or overheard conversation that they were a couple, a group of friends, or strangers who started chatting en route.

The category "Other" included some rarely seen activities, for example, a group of four women, each accompanied by small children, began taking photographs of each other. Applying makeup, brushing hair, rocking a baby's push-chair, nose-blowing, looking at a watch, buying a ticket from the guard, and drumming with a stick were among "other" activities recorded.

Table 5 shows the results of the logistic regression models for each activity, with odds ratios for the explanatory variables: gender, age, transport mode, and time of day. An odds ratio compares whether the probability of an event is the same for two groups; an odds ratio of 1 means that the event is equally likely for each group.

The difficulty about age group in the data collection was described above. Here, older adults are contrasted with the "young" group—adults who appeared to be up to about 35 years of age (the reference category). The time of day compares off-peak with peak time (the reference category).

The results in Table 5 show how activities interacted with the demographic and contextual factors of gender, age, mode, and time of day. Women were significantly more likely to be talking and less likely to be using a computer than men. Older people were significantly less likely to be texting, using headphones, eating/drinking, or looking ahead/out window than younger people but significantly more likely to be reading. As noted above, more people were looking ahead/out window on buses than on trains, and the odds ratio for this showed a statistically significant difference. Train passengers were significantly more likely to be reading, using a computer, sleeping/eyes closed, writing, and handling their wallet or belongings than bus passengers. Time of day reveals fewer clear-cut differences, with passengers significantly more likely to use a computer at peak travel times and more likely to be looking ahead/out window at off-peak times of day.

Of interest is the extent of multitasking by passengers. The observations showed some passengers were doing one, two, or three other activities at the same time as traveling. As an example, Figure 1 shows data from the Time 1 observations only of the numbers of passengers ever-observed undertaking two activities: listening on headphones and one other activity. Although this count is for Time 1 only, the numbers were not markedly different from the other observation points.

Table 5. Odds Ratios (OR) and 95% Confidence Intervals from Logistic Regression for Ever-activity according to Gender, Age Group, Transport Mode, and Time of Day

Activities	OR Gender: Female	OR Age: Older	OR Mode: Bus	Time of day: Off-peak
Looking ahead/out window	1.018 (0.760;1.363)	**0.564** (0.413;0.770)	**2.490** (1.831;3.386)	**2.523** (1.617;3.938)
Reading	1.236 (0.879;1.738)	**2.732** (1.837;4.063)	**0.353** (0.242;0.513)	0.668 (0.415;1.074)
Headphones on	0.797 (0.556;1.143)	**0.332** (0.232;0.476)	0.774 (0.542;1.107)	1.521 (0.939;2.464)
Talking	**2.070** (1.391;3.080)	0.812 (0.549;1.201)	0.781 (0.528;1.154)	0.774 (0.436;1.373)
Texting	0.709 (0.563;1.479)	**0.333** (0.204;0.544)	0.804 (0.494;1.308)	1.469 (0.771;2.799)
Sleeping/eyes closed	0.853 (0.524;1.388)	1.040 (0.628;1.723)	**0.313** (0.174;0.563)	0.756 (0.392;1.456)
Handling wallet, etc.	1.596 (0.924;2.756)	0.926 (0.535;1.602)	**0.471** (0.260;0.853)	0.811 (0.386;1.702)
Other	**1.909** (1.001;3.638)	0.631 (0.340;1.172)	0.683 (0.359;1.300)	1.271 (0.559;2.889)
Eating/drinking	1.077 (0.559;2.076)	**0.464** (0.240;0.896)	0.664 (0.335;1.317)	1.260 (0.530;2.998)
Using computer	**0.205** (0.084;0.500)	1.590 (0.730;3.464)	**0.036** (0.005;0.261)	**0.238** (0.071;0.792)
Writing	1.238 (0.564;2.717)	1.658 (0.687;4.000)	**0.228** (0.078;0.667)	0.768 (0.277;2.128)
On phone	1.033 (0.329;3.239)	1.190 (0.354;3.999)	1.305 (0.417;4.083)	1.327 (0.240;7.334)

Results significant at $p < .05$ are indicated in bold.

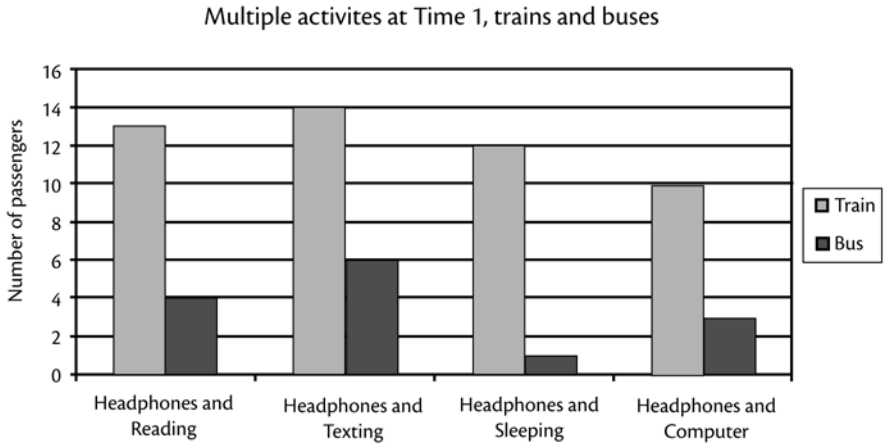

Figure 1. Number of bus and train passengers observed carrying out multiple activities at time 1 (n=812)

Other Observations

On the suggestion of passengers encountered on the long-distance Wellington-Palmerston North train, one of the researchers returned to travel part of the trip on this train on the last Friday evening before Christmas in 2008. Although many passengers appeared to undertake usual activities, others were partying around tables that, in parts of each carriage, unite four seats in pairs facing each other, sometimes with another four across the aisle. Seven or eight groups in different carriages had laid out bottles of wine and glasses, Christmas cake, and other party food; others added Christmas party hats, paraphernalia, and tinsel draped overhead and across the carriage lintel. These were groups of friends or acquaintances who regularly traveled and socialized together, usually celebrated on the Friday night train, and were making especially merry at Christmas. Evidently, considerable planning had gone into the preparations.

A further insight from the field work expands on Timmermans and Van der Waerden's (2008) reference to a travel time activity they call "romancing." During the observations, we saw couples and others traveling with a loved one and developed a conception of bus and train travel time as "relationship time" (Russell 2010), referring not only to romantic/couple relationships but also to other close relationships, those relationships that in Granovetter's terms are "strong ties" rather than "weak ties" (Granovetter 1973, 1983). Traveling with a loved one on public

transport may be precious and meaningful for the relationship (Russell 2010). This extends beyond romantic relationships to traveling with one's child, parent, sibling, or close friend when there may be both physical closeness and significant emotional intimacy even in such a public place as a bus or train.

Discussion

Discussion of Results

The passenger activity data reported here arose from a purposive sample of routes and times of day, allowing a comparison between bus and train trips in the Wellington region. The study explored the association of activities performed on public transport with demographic variables (gender, age), and transport variables (mode of transport and time of day.)

Observational studies in Japan (Ohmori and Harata 2008) and the U.S. (Timmermans and Van der Waerden 2008), a large British survey (Lyons, Jain et al. 2007), and a Norwegian survey (Gripsrud and Hjorthol 2009) were all studies of train passengers only. Thomas's (2009) Wellington study, like ours, included both bus and train passengers. The considerable differences in data collection and analysis preclude direct comparisons with our findings, but contrasting some of the results enables us to better understand the challenges of the method and contributes to future work.

Some findings are in accord with other studies and are not startling, in particular, that many people appeared to be "doing nothing," "thinking," "window gazing/people watching," or, in our terminology, "looking ahead/out the window." Our results for activities differ from Thomas's for basically the same population; for example, he found about a quarter of Wellington passengers engaged in "verbal behavior," reducing to 15 percent if couples were excluded, whereas we observed 15 percent altogether talking. Thomas observed a quarter of his sample engaged in "activities," whereas we found a quarter on buses but nearly a half on trains doing something other than looking ahead/out the window. Our observations of reading (22%) and listening on headphones (19%) were much higher than Thomas's, at 11 percent and 9 percent, respectively. It is unclear whether these differences relate to different times of year (we collected data in summer, Thomas in winter), different times of day, or, more likely, methodological differences.

The study found people on the bus were much more likely than train passengers to be looking ahead/out the window. Some of the differences between bus and train

passenger activities may be owing to the frequency of the service, the nature of the vehicle, or the length of the trip, as suggested by Lyons et al. (2007) above. On a short journey, one may not bother to get out a book or newspaper. Wellington trains run less frequently than many buses. Eating and drinking is formally prohibited on buses and some trains. In Wellington, many of the bus routes are through winding, hilly roads, possibly discouraging passengers who are even slightly subject to motion sickness from reading or writing. Activities also are constrained by whether or not one has a seat; it is difficult to read a newspaper while standing on a moving bus. The train offers a smoother ride, and more people were reading on the trains. The two-hour commuter train provided power-points and tables/trays, facilitating computer use and writing.

Another possible explanation comes from the notions put forward by Jain and her colleagues of the "equipped" passenger (Lyons and Urry 2005; Jain and Lyons 2008) and by Watts and her colleagues of the "packed" traveler, who comes prepared for the journey and unpacks in the vehicle, whose "bags and belongings" (Watts 2008) contain objects (book, pen, phone, food) that enable the journey to be spent in some way other than "doing nothing." Gripsrud and Hjorthol trace a link between passengers' enjoyment of travel and their "degree of preparedness, as measured by the number of items" they bring (Gripsrud and Hjorthol 2009).

A possible reason for smaller numbers of older passengers being observed is that the data collection mostly concentrated on peak-hour travel. Older people would be less likely to travel at this time if they are retired or in part-time employment, and the SuperGold Card, allowing free travel to New Zealanders 65 years and over, may be used only outside peak hours.

Differences in ticket purchasing on buses and trains may explain the difference in the extent of "handling wallet, etc." On buses, the ticket is shown or bought on entry, but on the Wellington trains, passengers' tickets are checked or sold by the train manager/conductor while the train is in motion, so some of the rummaging we observed may relate to this.

Discussion of Structured Observation as a Method

Using structured observation as a method for travel time use research was challenging. The vehicles have their set course and time frames, passengers are intent on their own lives and needs, and observers must work around these. The U.S. study seemed to gloss over some of the difficulties of data collection, stating that "because the data collection involves field observations, some mistakes will be

made" (Timmermans and Van der Waerden 2008). Our experience on the Wellington buses and trains suggests that the field observation method described by these authors would be almost impossible to carry out, particularly at peak time. Ohmori and Harata (2008) note more realistically that "it would be difficult to conduct the on-board observation in highly congested normal trains where seats are full and many passengers are standing" (Ohmori and Harata 2008). Reviewing the methods sections of some observational studies, and knowing the practical challenges of working in crowded vehicles, we were sometimes puzzled as to how exactly data were collected in the time available.

As ethnographers of travel time have already shown (Nash 1975; Delannay 2001; Fink 2006; Watts 2008), actually getting out and about on public transport with a researcher's eye can yield rich information about how people behave and spend their time on the bus or train. We developed the new category "Handling wallet, etc." because we saw how frequently passengers were doing this. This shows the value of observation, as a passenger who is asked an open question about travel time use may be unlikely to spontaneously mention this activity, and even if it is suggested as a category, it may not register as meaningful. This activity, perhaps, relates to Watts' (2008) "packed" traveler in the very act of unpacking or repacking.

Strengths, Limitations, and Further Research

This study adds to existing knowledge about travel time use. The strengths of the study are its size, the comparison of bus and train passengers, the attention to method and frankness about methodological challenges, and the inclusion of a pilot phase. A limitation of the study is that each passenger was observed by only one researcher. Another is that waiting time activities were not observed. Waiting is a significant and often overlooked component of travel time.

An underlying limitation of the study is the nature of the method itself. Recording observable behavior cannot reveal people's intentions, attitudes, or feelings. Hence, the main question arising from the research concerns the meaning and value of activities. What are the 65 percent of passengers observed looking ahead or out the window really doing? From the outside, it appears that these people are "doing nothing," not reading, writing, or listening on headphones, not talking or eating, just sitting or standing there. Are they really "doing nothing," and, if so, how do they feel about that time? Are they bored, anxious, or content? Or are they "doing something"—thinking, planning, remembering, praying, daydreaming—and, if so,

what does that mean for them in their everyday life? Is Thomas (2009) correct in identifying reading, wearing headphones, etc., as essentially "defensive" activities? How do passengers themselves understand travel time and how it affects their well-being? These questions can be answered only by asking passengers themselves. Future research will use qualitative methods to answer some of these questions, and further quantitative (survey) research will assess any differences between self-reported travel time use and the observational data reported here.

Conclusion

Adult passengers on buses and trains in the Wellington region, New Zealand, were engaged in a range of activities. While most spent some or all of their time simply "looking ahead/out the window," many were reading, sleeping/eyes closed, talking, using a computer, or listening on headphones, among other activities. In some cases, passengers appeared to be doing several things at once. There were differences between activities on buses and trains, with more people observed simply "looking ahead/out the window" on buses than on trains. This may relate to the length of trips or to the hilly and winding terrain covered by buses in Wellington, compared to trains, or the extent to which passengers come prepared for the journey.

Structured observation is a challenging but rewarding method for researching passengers' use of travel time. Greater frankness about methods and more detail about data collection protocols would be a welcome contribution in the literature.

The prevailing assumption in transport planning and transport economics that travel time is a "disutility to be minimised" (Mokhtarian 2005) is open to challenge. Passengers are not always "doing nothing" while traveling, and even if they are, this inactivity may have value for them. Similarly, the activities many engage in while traveling also may have value to them as individuals and in terms of wider economic and social wellbeing. Further research is needed to explore and explain the meaning and value of public transport travel time use and to develop ways in which transport planners and economists can address these realities.

Acknowledgments

Thanks to Juliet Jain and Patricia L. Mokhtarian for their comments and encouragement. Thanks also to two anonymous reviewers who made very useful comments on an earlier version of the article.

Funding Sources

Ms. Russell's research was supported by a scholarship from SPEaR Social Policy Evaluation and Research, New Zealand Ministry of Social Development. Ms. Price was sponsored by the Maurice and Phyllis Paykel Trust. Mr. Gerring's work was supported by the Wellington City Council. The funders had no involvement in the research.

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