

Understanding the Value of Time: A Travel Time Analysis

ABSTRACT

To gain insight into the value of time, two train travel based studies explore the impact of arrival delays on utility and the value function. The studies find support for the double-kinked value function, but also identify a time style cluster of individuals who react substantially differently to delays.

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While some research on consumer valuation of time indicates that it can be viewed as an objectively measurable resource (Jacoby et al 1976), it is also understood to be subjectively evaluated by individuals (Lallement and Gourmelen 2018).

Time is a resource that can be used through activity to derive utility (Becker 1965; Festjens & Janiszewski 2015; Mogilner, Hershfield and Aaker 2018; Graham 1981). As such, an individual will experience decreased utility levels if blocks of time are lost to delays (Jacoby et al 1976; Okada and Hoch 2004). Because the value of a block of time is influenced by what can be achieved in that time, the size of a block of time is important. So the Value of Time (VT) is situational (Lallement and Gourmelen 2018). Because VT increases with improved opportunity for use and decreases with abundance, it is expected to follow a double-kinked value function (Festjens & Janiszewski 2015).

Time styles research indicates that individuals view time differently (Bergabaa 1990; Hirshmann 1987). Time styles recognize that time is subject to social and demographic influences (Cotte et al 2004; Tu and Soman 2014; Hornik 1984). So VT is also personal.

VALUE OF TRAVEL TIME (VTT)

VT is interesting within a travel context because travel can be discretionary or mandated (Woodside et al 2007; Shores and Scott 2007). Transportation research notes that there is an interplay between willingness to pay and VTT, so railways try to optimize travel time (TT) (Galetzka et al 2018). This implies that TT is a cost or disutility. If time spent traveling is primarily utilitarian, then delays are a loss of an asset (Cherlow 1981; Devarasetty et al 2012). VTT will increase when TT can be spent more productively or comfortably. This is particularly important given the digital revolution which allows individuals to enhance their time usage (Kouwenhoven and de Jong 2018).

Study 1: Travel Delays and Disutility

RQ-1: Does the double-kinked value function (Festjens & Janiszewski 2015) explain disutility caused by travel delays?

METHODOLOGY

Data Collection: In this pilot study, 68 complaints about travel delays on Amtrak train service were analyzed. The post-service complaints were posted on www.consumeraffair.com between June 2015 and February 2018. This represents 28.9% of all Amtrak comments.

Analysis: Once the data text had been established, multiple readings familiarized the researcher with the content. The text was then coded to unitize the text. This included a noting of reason for complaint, size of delay, etc. The text was then analyzed for context: travel party, timing, reason for travel, etc. Finally, the text was analysis was synthesized to draw out meaning from the comments.

Results: Five themes emerged from the analysis. Problems with on-board comfort (toilet disrepair and smells, temperature, seating, co-passengers) was the most frequent and intense issue exacerbated by the delays. On-board productivity (wifi, plugs) was moderately mentioned but did not coincide with emotion. Instead, a lack of staff-provided information about the delay had a strong impact on disutility. Staff friendliness/helpfulness had a direct impact on TT utility. Finally, the delay's impact on post-travel activities (connecting travel, meetings etc.) caused substantial on-board disutility.

While these themes address the research question, it did so generally in increasing disutility – though in some cases, positive train personnel did mitigate the disutility, as judged by the rating they gave.

This study found support for the disutility side of the double-kinked value function. Study two attempts to address both sides of the value function.

Study 2: Identifying Travel Delay/Utility Clusters

Study one identified comfort, productivity, information gaps, post-travel obligations and train staff friendliness as factors that impact TT disutility. Industry practice, however, indicates that train travel may be enjoyable. This is supported by the research of Hamilton and Alexander (2014) in their analysis of the Jacobite train through the Scottish Highlands. They demonstrate that a train is not simply a vehicle, but “provides a consumption experience in its own right.” (9:09).

RQ-2: Does the double-kinked value function explain (dis)utility associated with travel time?

Sperry et al (2011) showed that within a train travel context, it was possible to identify behavioral clusters. This is consistent with time styles research (Cotte et al 2004).

RQ-3: Is it possible to identify clusters of individuals who display (dis)utility associated with travel time?

METHODOLOGY

Data Collection: Over a two week period, interviews were conducted with individuals traveling between three major North American cities -- two of the cities were two hours apart, and they were each five hours away from the third.

The first day, on five hour journeys, a total of 25 short interviews were undertaken. The interviews ranged from 5-15 minutes. They were specifically designed to elicit the words used by passengers, and to inform the long interviews of days 2 and 3.

Based on responses from the first three days, two additional evening trips were added in. In total, days 2-5 resulted in 17 interviews ranging in time from 20-70 minutes. Nineteen one-way trips encompassing over 60 hours on-board were completed.

Analysis: Once the data text had been established, multiple readings familiarized the researcher with the content. The text was then coded to unitize the text. This included a noting of reason for complaint, size of delay, etc. The text was then analyzed for context: travel party, timing, reason

for travel, etc. Finally, the text was analysis was synthesized to draw out meaning from the comments.

Results: Analysis of the interview data indicated the presence of two distinct reactions to time delays in train travel. Each group includes individuals traveling for business or pleasure. The groups are split largely, but not exclusively, based on ridership in coach or business class. This purchase decision will be discussed following the cluster description.

Cluster 1: The Train Gets Me There

The first group treats the train trip as a utilitarian good. It believes that time on-board is an expense. A delay is an increase in that expense, so a decline in trip value.

Laura is taking the train because she doesn't like driving without her husband. Besides there is only one car in the family and her husband generally uses it for work locally. Laura is visiting her mother, and this is a convenient way to travel at a reasonable price. She pays for her own travel. On-board prices are high, so she brings coffee from home.

Time on-board is a necessity. It is simply a way to get from A to B. Price is important – a key factor in determining the value of the trip. This group includes college students returning to school.

Price sensitive, this group avoids extra on-board spending. Free WIFI is an important feature for these passengers. They complain about the instability of the network, but they still use it, even if it means losing their connection periodically. They have data limits on their phones.

A short delay is accepted – maybe even expected – but if that delay gets beyond 15-20 minutes, they become frustrated. Any extended delay increases the rate of frustration, at increasing rates. They feel that they are wasting time. They will complain.

Business travelers in this cluster display similar behaviors and time views.

Annie, a mid-level manager, travels every week. Her company covers the travel costs, but she has to justify the expense to her supervisor. She takes the early train to make the meetings setup for her. She doesn't buy coffee on-board. She uses the time on social media or to sleep. The train is running 20 minutes late. Annie is stressed that she will be late for her first meeting. This is a problem for her.

This is the group of professionals who travel by train because it is cheaper than flying, but they would prefer to fly. They believe that 'work' will only begin once they arrive at the destination city.

Most arrive at the destination with a tight schedule – over which they have little control. They will hear about it from supervisors and clients if they are late. Avoiding delay is a priority. Asked about the implications of arriving early, and the consensus was clear. They would be thrilled.

This group is quiet on board. Though the WIFI could be improved, they are not about to use up their personal data plans. Thirty minutes into the trip, most are asleep. So they do not really experience the travel time. They will, however, be awake in time to experience the delay.

As shown in Figure 1a, Cluster 1 demonstrates strong support for the double-kinked value function.

FIGURE 1a HERE

Cluster 2: Time On-Board is Productive

This group recognizes the hedonic aspects of the trip. It believes that time on-board is an asset to be used/enjoyed. A reasonable delay actually increases the asset's value.

Mary travels frequently and pays for her own travel. She enjoys the train ride. It allows her to read, watch the scenery and socialize. She enjoys sharing her stories with other travelers and learning about their stories. Mary loves the food and the friendliness of the crew. As we speak, she has a refill of her coffee and explains that she prefers the afternoon and evening trains because she loves her wine. She sometimes naps, but it is not her ideal...it wastes enjoyable time. The train is on time today, but she wouldn't mind if it were late. She is finishing a book, an extra half hour would be nice.

For this group, the time onboard is a pleasant experience augmented by the comfort, food and staff. They read, converse or watch something on their iPad. Part way through the trip, some nap, but they have no desire to sleep the trip away.

In the morning, they have a coffee and wait for the breakfast service -- generally talking or enjoying the landscape. On afternoon trips, they order a drink. Bar service is quick, and they appreciate it. Once the dinner is served, they eat at a leisurely pace. They are happy to have their wine glass refilled.

This group wants to socialize. Consider Chantal. She wants to talk to her seatmate. She loves learning about people's trips and lives. Within minutes, she has explained where she was born, her husband's occupation, why he retired last year, and her thoughts of the town she works in.

The prospect of arriving early does not excite this group. In fact, two people expressed concern that if the train were too early, they would actually feel robbed of some of the time they had purchased.

Business travelers in this cluster display slightly different behaviors, but similar time views.

Tina, a telecom professional, travels monthly. Her company pays for the travel. She works on the morning trip using her cellphone as a hotspot. Her preference is to work without being disturbed so that she can do her prep-work for afternoon meetings. On the way home, she enjoys the quiet of the ride – surrounded by a group of similar people, a glass of wine in hand. She is willing to talk to a seatmate on the return trip....but ideally only during dinner. On this return trip, the train will be late. Tina doesn't really care.

For this group, the morning trip is about productivity. Once on board, they receive their first coffee and wait for the breakfast service. Once the breakfast is served, they eat quickly. They are happy to have the tray removed. Their laptops are out immediately. The screens show reports, excel sheets and email systems. Alone within their on-board office space, they work.

The passengers are quiet. Asked if he talks to others on-board, Robert replies: "I say hi to the person next to me." Does he initiate conversations? "No." He smiles as if to say 'are you kidding?' His hands wave like someone declining an offer. Conversation is tolerated, not appreciated.

They appreciate the small table between the seats – it is a buffer. Space is important. As Robert describes it, he uses his hands to point to the seat roominess, the legroom, the window space: “It’s like a home office.”

One passenger explains that he has done the math. On the five train hour trip, he has four hours of productive time. The same trip by plane is only one hour in the air, but 60-90 minutes extra for airport security and an hour to get downtown -- and no productivity at any point: “Flying is faster, but provides no work time.”

Unexpectedly, there was strong consensus that time delays were unimportant. On-board productivity outweighs time lost to delay. Susan, a regular traveler, explains that time is “a variable in determining my productivity. Any delay simply means that I have more time to work.” Her meetings are booked for general times, not for a rigid schedule: “I tell them that I will be there around 9:30, not at 9:30.” She is not a slave to time.

For these business travelers, the return trip typically starts at 5:00 pm or later -- and is almost identical to the leisure travelers in this cluster. This trip is about winding down. They appreciate the bar service, the pace of the dinner, and then relaxing with a book or movie.

On the morning trip up, the train was their office. On the evening return trip, it is their den.

Cluster 2 displays a value function that is substantially different from the double-kink value function (see Figure 1b).

IMPLICATIONS

While the research results shows some examples of differences between passengers traveling in coach and business, that was not a true separating variable between the clusters. Instead, there were many in coach who fully understood the positive aspects of time on board, but faced cost constraints that resulted in the purchase of a coach ticket. There was also a small group of travelers who were in business class because they could afford it, but demonstrated all of the time frustration noted in cluster 1.

There was support for the double-kinked value function when VTT was assessed as a utilitarian good. Increasing disutility was pronounced when confronted with travel delays. This was heavily influenced by environmental issues on the train and ability to make of the time. In study 1 this was exacerbated by a lack of available information about the delay.

FIGURE 1b HERE

In contrast, study 2 clearly shows that differing time styles can result in changes to the structure and inflection points of the value function.

LIMITATIONS & FUTURE RESEARCH

This research provides initial evidence of behavioral clusters in time. This combines extends the understanding of the value of time and time styles. Future research could attempt to better understand the underlying factors that create those clusters. For example, there is some evidence in study 2 that travel experience has an impact on setting expectations. Research that explores the link between travel experience time styles may provide insight into cluster development.

Study 2 provided insight though long interviews. It relied on the self-evaluations of individuals over a short period of time. It is possible that individuals traveling at important times (Christmas, Mother's Day, etc.) would shift the value functions.

Train travel attracts a certain demographic. It is possible that the selection of train travel fails to draw out some additional insights. So it may prove fruitful to test these findings in non-train travel. Are people who fly when train is an option more focussed on time?

REFERENCES

- Becker, Gary (1965), "A Theory of the Allocation of Time," *Economic Journal*, 75(September), 493-517.
- Beesley M.E. (1965), The Value of Time Spent in Travelling," *Economica*, 32, 174-185.
- Bergadaa, Michelle (1990), "The Role of Time in in the Action of the Consumer," *Journal of Consumer Research*, 17(December), 289-302.
- Cherlow, Jay (1981), "Measuring Values of Travel Time Savings," *Journal of Consumer Research*, 7(March), 360-371.
- Cotte, June, S. Ratneshwar, and David Glen Mick (2004), "The times of Their Lives: Phenomenological and Metaphorical Characteristics of Consumer Timestyles," *Journal of Consumer Research*, 31(September), 333-345.
- Devarasetty, Prem Chand, Mark Burris, and Douglas Shaw (2012) "The Value of Travel Time and Reliability – Evidence From a Stated Preference Survey and Actual Usage," *Transportation Research Part A*, 46, 1227-1240.
- Festjens, Anouk, and Chris Janiszewski (2015), "The Value of Time," *Journal of Consumer Research*, 42, 178-195.
- Galetzka, Mirjam, Ad Pruyn, Mark van Hagen, Martijn Vos, Brit Moritz, and Floor Gostelie. "The psychological value of time." *Transportation research procedia* 31 (2018): 47-55.
- Graham, Robert (1981), "The Role of Perception of Time in Consumer Research," *Journal of Consumer Research*, 7(March), 335-342.
- Hamilton, Kathy, and Matthew Alexander (2014) ,"Consuming Journeys: Exploring Place in Motion", in NA - *Advances in Consumer Research* Volume 42, eds. June Cotte and Stacy Wood, Duluth, MN : Association for Consumer Research, Pages: 757-757.
- Hirschman, Elizabeth (1987), "Theoretical Perspectives of Time Use: Implications for Consumer Research," *Research in Consumer Behavior*, 2, 55-81.
- Hornik, Jacob (1984), "Subjective vs Objective Time Measures: A Note on the Perception of Time in Consumer Behavior," *Journal of Consumer Research*, 11(June), 615-618.
- Jacoby, Jacob, George Szybillo, and Caol Kohn Berning (1976), "Time and Consumer Behavior: An Interdisciplinary Overview," *Journal of Consumer Research*, 2(March), 320-339.
- Kouwenhoven, Marco, and Gerard de Jong. "Value of travel time as a function of comfort." *Journal of choice modelling* 28 (2018): 97-107.
- Lallement, Jeanne, and Andrea Gourmelen. "The time of consumers: A review of researches and perspectives." *Recherche et Applications en Marketing (English Edition)* 33, no. 4 (2018): 92-126.
- Mogilner, Cassie, Hal E. Hershfield, and Jennifer Aaker. "Rethinking time: Implications for well-being." *Consumer Psychology Review* 1, no. 1 (2018): 41-53.

- Okada, Erica M. and Stephen J. Hoch (2004), "Spending Time versus Spending Money," *Journal of Consumer Research*, 31 (September), 313-23.
- Sperry, Benjamin, Kristopher Ball, and Curtis Morgan (2011), "Cluster Analysis of Intercity Rail Passengers in Emerging High-Speed Rail Corridor," *Transportation Research Record: Journal of the Transportation Research Board*, 2261, 31-38.
- Shores, K., & Scott, D. (2007). The relationship of individual time perspective and recreation experience preferences. *Journal of Leisure Research*, 39(1), 28-59.
- Tu, Yanping, and Dilip Soman (2014), "The Characterization of Time and its Impact on Task Initiation," *Journal of Consumer Research*, 41(October), 810-822.
- Woodside, A. G., Caldwell, M., & Chebat, J. (2007). Advancing theory for understanding travelers' own explanations of discretionary travel behavior. *Journal of Travel & Tourism Marketing*, 22(1), 15.

FIGURE 1: TIME VALUE FUNCTIONS

