# Why the trip home is shorter, but not faster

Charlton, S. G. & Starkey, N. J.

Traffic and Road Safety Research Group, School of Psychology, University of Waikato, Hamilton, New Zealand.

Email for correspondence: samiam@waikato.ac.nz

## Abstract

When we travel by car the trip home often seems shorter than the initial trip away from the place of origin. This perceptual phenomenon (called the Return Trip Effect) has been noted in many contexts and its existence has puzzled drivers and researchers alike since the distance travelled and time spent traveling are usually identical. It has recently been proposed that the reason for this effect may be due to the fact that the outward trip has more unpredictable elements which make the initial trip seem longer. An alternative interpretation is that drivers pay less attention to familiar tasks (like the trip home) and our sense of trip duration is shorter when we are engaged in task-unrelated thoughts. In this paper we provide data from a driving simulator experiment that contrast these two interpretations as well as determine actual travel times as drivers complete return trips on familiar roads. The results indicate that there is no difference in participants' travel times on the two legs of the journey (i.e., the return trip is not actually faster). When elements of the scene are changed to include new elements and change existing elements during the return leg, the participants' actually did travel faster (decreasing their return trip time). Although changing expectations may play a role in the Return Trip Effect for unfamiliar destinations, when traveling on familiar roads these data suggest that lower levels of conscious engagement with driving is the likely reason for the subjective experience of shorter return trips.

## Introduction

The Return Trip Effect is the subjective experience that the journey home seems to pass more quickly than the initial trip we took when we left home. For example, the journey home from a holiday often seems much shorter than the outbound portion of the trip, even though the distance outbound and homeward-bound is usually the same. This experience has been described in a wide range of travel contexts (e.g., bicycle, bus, plane, and ocean voyages) but little empirical research has been conducted into the reasons for this phenomenon.

The size of the time differential experienced is quite large. One of the few experimental studies asking participants to estimate trip durations reported estimates of the return trip that were 17% to 22% shorter than the initial trip (van de Ven, Rijswijk, & Roy, 2011). In a somewhat similar study, vacationers were asked to mentally divide their Club Med holiday into three equal parts (beginning, middle, and end) and rate which of them passed most quickly. Fifty-one percent said that the last third of their holiday seemed the shortest and only 12% felt that time seemed shortest in the first part (Avni-Babad & Ritov, 2003).

Why does the Return Trip Effect occur, and does it occur only when we are on holiday? Several reasons have been advanced for the effect and one of the oldest is based on the effects of novelty and familiarity on the perception of time and our memory for event duration. The basic idea is that unfamiliar or unpredictable events take more cognitive resources to process, which is associated with an increase in experienced duration. Retrospectively, these unfamiliar events serve as markers for judging the passage of time, and the more events remembered the longer the judged duration. Early research appeared to indicate that it was the extent to which these events produced a contextual change that mattered most in producing overestimations of time (Block & Reed, 1978).

Subsequent research appeared to confirm this pattern of results: increases in difficulty of information processing lead to increases in experienced duration, and increases in stimulus complexity lead to increases in remembered duration (Block & Zakay, 1997). Conversely, the duration of a routine activity is remembered as shorter than an equivalent amount of time engaged in a non-routine activity (Avni-Babad & Ritov, 2003). These findings were generally consistent with the early observation by William James that “awareness of change is thus the condition on which our perception of time’s flow depends” (James, 1890, p. 620). In the context of the present paper, the reason it seems to take less time to go the same distance on the trip home is because a person is now familiar with the route, having travelled it before.

A second possible reason that has been raised for the Return Trip Effect is based on people’s expectations of how long a trip will take rather than the relative familiarity of the initial and return leg of the journey. This account of the effect begins with the finding that people often underestimate how long a task will take them to complete (Kahneman & Tversky, 1979; Roy, Christenfeld, & McKenzie, 2005). The account goes on to argue that this expectation is typically violated during the initial leg of the journey (i.e., the trip took longer than expected). When it is time for the return trip the expectancy violation is what is remembered about the initial leg, and the journey home is now shorter than expected (as one’s expectancies have changed) and it is perceived as being shorter than the outbound trip (van de Ven, Rijswijk, & Roy, 2011).

Of these two accounts, those based on familiarity versus those based on violations of expectancies, the latter appear to be more favoured currently (van de Ven, Rijswijk, & Roy, 2011). A third possibility, however, is worth some consideration. This possibility, perhaps the simplest, is that in some cases the return trip actually is shorter, because people drive faster on the way home. The actual duration of the return trip (as opposed to its perceived duration) has not, as far as we are able to determine from the published literature, ever been investigated. This rather substantial oversight in the investigation of the phenomenon probably stems from the assumption that two trips of the same distance will necessarily take the same amount of time; in other words, failing to consider that in the case of car trips the speed choices made by drivers may differ on the outbound and return legs of a trip.

The work described in this paper attempts to rectify that oversight by examining some data from our laboratory that, although collected for other purposes, allow us to compare the actual duration of outbound and return trips. Although estimates of trip duration were not collected in this experiment, it does offer an opportunity to address one aspect of the Return Trip Effect, whether the duration of return trip is actually shorter. If drivers do drive faster on the return trip, there are obvious road safety implications. Further, the experimental design also provides an opportunity to consider the contribution of novelty and familiarity in speed and trip duration.

## Method

### *Participants*

Ethical approval was received from the School of Psychology Research Ethics Committee at the University of Waikato. Participants were recruited via word of mouth, advertisements on notice-boards, word of mouth (i.e., a convenience sample). The participants of interest in the present paper comprised a group of drivers who were recruited to drive in the driving simulator regularly over a period of approximately 3 months. This group of 29 participants were aged from 17 to 49 years of age (M = 30.17 years, SD = 11.52), and reported that they regularly drove between 10-500 km per week (M = 138.93 km, SD = 138.55) and on average had 15 years of driving experience (range 2-35 years, SD = 11.46).

Twenty-four of the participants completed 20 experimental sessions. Two of the participants withdrew after Session 6, one withdrew after Session 11, one after Session 12, and one after Session 14. Non-completion by these participants was due to time constraints or medical reasons. In recognition of their participation in the study, participants received a $10 gift voucher for each experimental session they attended.

***Apparatus***

The experimental apparatus was the University of Waikato driving simulator consisting of a complete automobile (BMW 314i) positioned in front of three angled projection surfaces producing a 175˚ (horizontal) by 41˚ (vertical) forward view of the simulated roadway from the driver's position. In addition, two colour LCDs were mounted at the centre rear-view mirror and driver's wing mirror positions to provide views looking behind the driver's vehicle. The details of the driving simulator have been previously described elsewhere (Charlton & Starkey, 2011).

The simulation scenarios were based on a 24 km-long section of rural road containing a combination of straights and gentle horizontal and vertical curves. The road geometry was based on the surveyed 3-dimensional road geometry of a rural two-lane state highway in New Zealand. The simulated road was divided into two 12 km halves, each half containing eight intersections. Each half of the simulated road could be driven in either direction (northbound or southbound), with a village marking the central point of the simulated road. Drivers could start at either the north end of the road and finish in the village, start in the village and drive either north or south, or start at the southern end of the road and drive to the village. The speed limits were 100 km/h, apart from a 400 m section which passed through the village and had a speed limit of 60 km/h. Each half of the road contained a range of prominent landmarks (e.g. houses, shops, farms, and directional signs) to facilitate participants' recognition of their surroundings as they became familiar with the road over repeated sessions (see Figure 1).


***Figure 1. Scenes from the driving simulation. A typical road section (top left), a section containing road works (top right), removal of centre line for 200 m (bottom left), and road signs changed to German wording (bottom right).***

Using the simulated northern and southern road sections described above, 38 distinct scenarios were created and presented across 20 experimental sessions. Most of the scenarios differed only in the placement of other traffic on the roads. Pertinent to the current research, several of the sessions contained cases in which the participants made a round trip; e.g., they drove north on the northern section and in the second half of the session (following a 5 min rest break) they made a return trip driving south to their starting place. Further, in three of these sessions the scenarios were changed for the return trip portion of the session. Termed Change Detection scenarios, changes were made to roadside buildings, warning signs, road markings (removal of edge lines and centre lines at certain points), directional signs changed from English to German wording, and an oncoming police car was added (details of the changes can be found in Charlton & Starkey, 2013).

***Procedure***

At the start of the first session, each participant was given an overview of the activities involved in the experiment, asked to complete an informed consent agreement, and allowed to practice until they felt comfortable driving the simulator. At the start of every session the participants were instructed to drive in the simulator as they would normally drive in their own car. They were also instructed to sound the horn whenever they noticed anything interesting, unusual, hazardous, or a Volkswagen beetle, and name it aloud. It should be noted that the same instructions were given at the start of each session and that the participants were not alerted to the possibility of changes to the scenarios or given any special instructions for the Change Detection scenarios. At the end of each scenario all participants were asked to rate the difficulty of driving the simulated road on a seven-point driving difficulty scale ranging from 1 = easy; no difficulty at all to 7 = extremely difficult; unsafe.

***Results***

The first of the sessions containing a return trip occurred on Session 4 of the experiment. At that point in the experiment the participants had seen that section of road twice before, once each in Sessions 1 and 2. In Session 4, 200 m of road works were added to the scenario for both the outbound and return trip. Comparing the travel times associated with the two halves of the session, the return trip was an average of 3.81 sec shorter, but this was in the context of an overall average of 465.85 sec (7 min 45.85 sec) for each leg, and was not a statistically significant difference; $F(1, 24) = 1.17$, $p = .291$, $\eta_p^2 = .046$. [Note that this was for 14 female and 12 male participants for whom trip times were available for this session.] As can be seen in Figure 2, the male participants did tend to drive faster than the women (i.e., had shorter trip durations), but there was no statistical main effect of gender, or any gender by trip interaction.

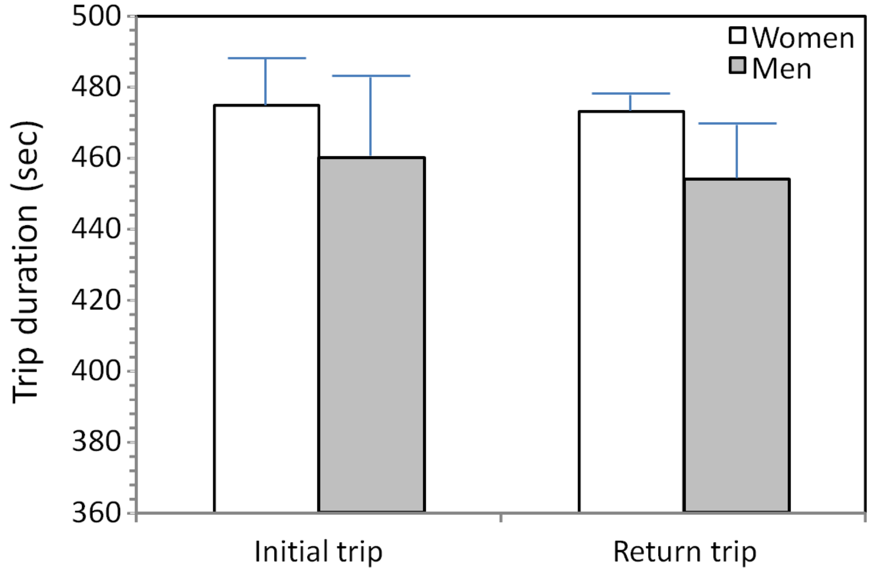


***Figure 2. Mean trip durations for the participants' fourth experimental session. Error bars indicate 95% confidence intervals.***

As shown in the left side of Figure 3, subsequent sessions with identical outbound and return trips (sessions 7, 9, and 14) also showed nearly identical travel times for each trip (i.e. trip time differences near zero). However, when changes were made to the road for the return trip of the Change Detection sessions (shown in the right side of Figure 2), the average length of the participants' return trip was 5 to 10 sec shorter than the outbound trip. Statistical analysis showed that the difference between the two types of sessions was significant across the three sessions, $F(1, 26) = 17.16$, $p < .001$, $\eta_p^2 = .398$. There was not, however any significant change in the trip time differences over the course of the experiment (no effect of session number), or any significant interaction between session type and session number.

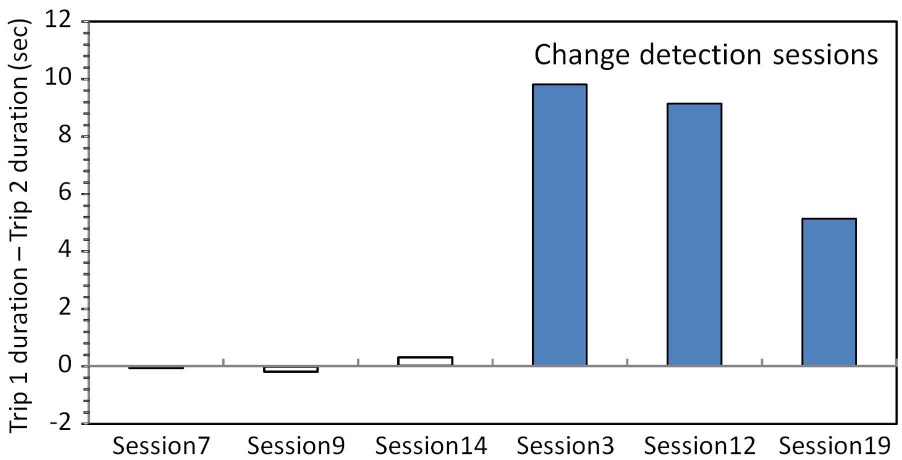


***Figure 3. Trip time differences for six experimental sessions. Positive values indicate shorter times for the second drive of the session (i.e., the return trip). The three sessions on the left contained identical roads for the outbound and return trips. For the three sessions on the right, changes were made to roadside buildings and road markings for the return trip.***

Interestingly, when the trip time differences were analysed by gender there was a significant interaction between gender and session type such that the women participants increased their speed by the largest amount during the change detection sessions, $F(1, 25) = 4.19$, $p = .051$, $\eta_p^2 = .143$. This interaction is illustrated in Figure 4. [Note that these latter analyses were based on data from 15 female and 12 male participants for whom trip times were available for this session.]

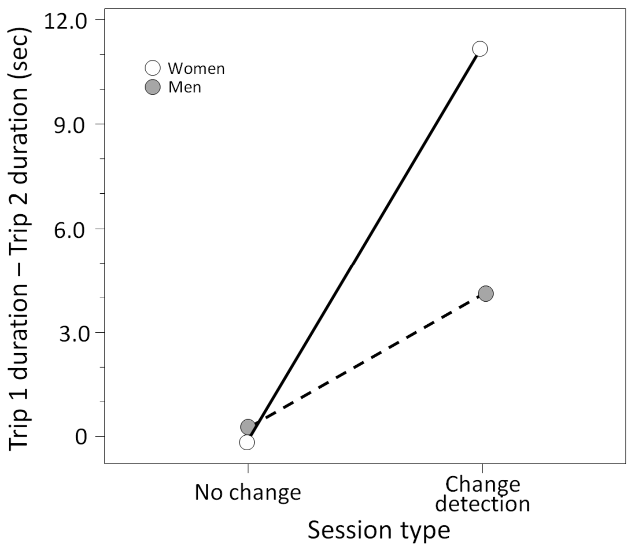


***Figure 4. Participants' trip time differences as a function of their gender and session type. Positive values indicate shorter times for the second drive of the session (i.e., the return trip).***

The above results beg the question of what the participants were doing during the Change Detection trips that was different than other trips? During every session participants were instructed to report aloud whenever they noticed anything "interesting, unusual, or hazardous", and during change detection trips, the number of items reported increased significantly (see the top panel of Figure 5) as indicated by a significant interaction between trip and session type, $F(1, 23) = 12.73$, $p = .002$, $\eta_p^2 = .356$. There was no main effect of participant gender or interaction of gender with any other variable.

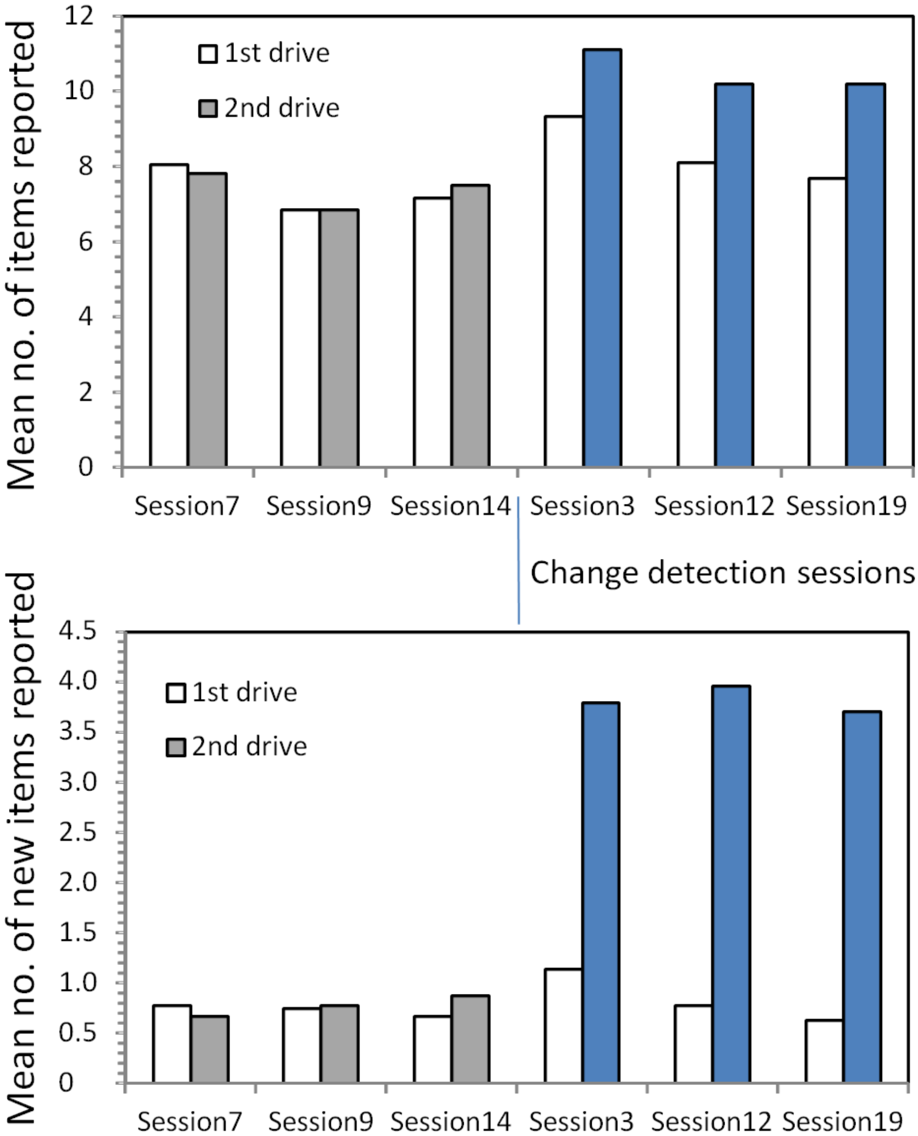


***Figure 5. The mean number of items reported by participants for six experimental sessions. The top panel shows the average of all items reported during each drive and the lower panel shows the average of new items reported (not reported on the previous drive on the same road).***

The lower panel of Figure 5 shows another view of the participants reporting while driving, their reporting of new items (i.e., items that had not been reported in the preceding drive on the same road). Statistical analysis of the new items reported indicated the same significant interaction between trip and session type as described above, with an even larger effect size, $F(1, 23) = 147.22$, $p < .001$, $\eta_p^2 = .755$. Finally, analysis of the driving difficulty ratings indicated that this increase in reporting of new items during the second drive was accompanied by significantly higher driving difficulty ratings, a significant interaction between trip and session type $F(1, 22) = 4.71$, $p = .041$, $\eta_p^2 = .176$.

## Discussion

The research described above was intended to address to what degree the subjective experience known as the Return Trip Effect may result from a previously unexplored aspect; specifically, an objective reduction in travel times on return trips. As with many research questions, however, the path to answering the one intended often leads to other, unanticipated, questions.

Are return trips objectively shorter? The findings described above would suggest that while they may subjectively feel shorter, they are not significantly faster. The discerning reader will, however, detect a major flaw at arriving at a definitive conclusion based on our analysis, namely that we did not ask participants for estimates of the trip durations.

Unexpectedly, and potentially just as interesting, we found that for trips in which some elements of the environment had changed, travel times did decrease significantly. In other words, adding the new elements resulted in the participants driving faster. This leads us to ask the question what caused these participants to drive faster? Looking at what was different about these drives we can see that the drivers were detecting changes in the environment, which perhaps led to them being engaged in the driving task in a different way.

One possible interpretation of this finding is that the apparent passage of time tends to slow down as processing demands increase (Block & Zakay, 1997). The participants' driving difficulty ratings did show significant increases during these sessions and any resulting subjective time dilation could have led drivers to unconsciously increase their speeds to compensate. Another possibility is that the changes to the driving environment served as a form of distraction, drawing the participants' attention away from the driving task and leading to poorer speed management and somewhat shorter travel times.

There is, however, one additional finding that deserves mentioning before leaving the subject. During the study from which our data were drawn (Charlton & Starkey, 2013), there were two sessions in which the visual appearance of the road and roadside environment were changed completely (while leaving the road geometry the same). During these sessions (called unfamiliar road sessions) the participants' displayed significant reductions in their driving speed (and consequently trip times were longer). Thus, another possible factor contributing to the Return Trip Effect is the tendency for drivers to reduce their speeds in visually unfamiliar environments, such as on the outbound trip.

Have we definitively addressed the role of speed choice in the Return Trip Effect? Perhaps not to the degree we had hoped, particularly given the lack of time estimates from the participants. As with any interesting research question, however, it has led us to more questions, which will need additional research to answer. And with any new questions or research to consider, we will spend many delightful hours working on answering them, or at least it may seem like many hours.

## References

Avni-Babad, D. and Ritov, I. (2003). Routine and the perception of time. *Journal of Experimental Psychology: General*, *132*, 543-550.

Block, R.A. and Reed, M.A. (1978). Remembered duration: Evidence for a contextual-change hypothesis. *Journal of Experimental Psychology: Human Learning & Memory*, *4*, 656-665.

Block, R.A. and Zakay, D. (1997). Prospective and retrospective duration judgments: A meta-analytic review. *Psychonomic Bulletin & Review*, *4*, 184–197.

Charlton, S.G. and Starkey, N.J. (2011). Driving without awareness: The effects of practice and automaticity on attention and driving. *Transportation Research Part F: Traffic Psychology and Behaviour*, *14*, 456-471.

Charlton, S.G. and Starkey, N.J. (2012). Does Familiarity breed inattention? Why drivers crash on the roads they know best. In *Proceedings of Australasian Road Safety Research, Policing and Education Conference 2012*, 4 - 6 October 2012, Wellington, New Zealand (pp. 1-10). Wellington: Ministry of Transport

Charlton, S.G. and Starkey, N.J. (2013). Driving on familiar roads: Automaticity and inattention blindness. *Transportation Research Part F: Traffic Psychology and Behaviour*, *19*, 121-133.

James, W. (1890). *Principles of Psychology*. New York: Holt.

Kahneman, D. and Tversky, A. (1979). Intuitive predictions: Biases and corrective procedures. *TIMS Studies in Management Sciences*, *12*, 313-327.

Roy, M.M., Christenfeld, N.J.S., and McKenzie, C.R.M. (2005). Underestimating the duration of future events: Memory incorrectly used or memory bias? *Psychological Bulletin*, *131*, 738-756.

van de Ven, N., van Rijswijk, L., and Roy, M.M. (2011). The return trip effect: Why the return trip often seems to take less time. *Psychonomic Bulletin & Review*, *18*, 827-832.