

Title	A relativity account of the "return trip effect" : Why does the return trip feel shorter?
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論 文 内 容 の 要 旨

氏 名 (小 澤 良 祐)

論文題名

A relativity account of the “return trip effect”: Why does the return trip feel shorter?
 (相対性に基づいた往復効果の説明: なぜ帰り道は短く感じられるか?)

論文内容の要旨

[Purpose] When we move from a station to a destination, and then return to the station, the return trip often feels shorter than the outward trip. This illusory experience of time, termed the “return trip effect,” has been explained to arise from the heavier importance of time in the outward trip compared with the time in the return trip, or from greater novelty of landscapes during the outward trip. However, such explanations lack concrete evidence owing to the difficulty of conducting laboratory experiments. In this study, through a series of experiments, I explored why the return trip feels shorter. In Experiment 1, I examined whether it is possible to detect the “return trip effect” in the laboratory and whether the illusion results from “heavier” importance of time, or faster clock speed, in the outward trip. In Experiment 2, I examined whether the decrease of novelty of landscape is essential. In Experiment 3, I tested whether the trip must be a “return” in inducing the illusion. In Experiment 4, I addressed an additional question of whether the time perception is related with sense of direction. Based on the results of these experiments, I finally propose a new hypothesis that explains why the return trip feels shorter.

[Methods/Results] Experiment 1. A group of participants were asked to view a movie of an outward trip and then another of a return trip, each of which lasted approximately 30 min and was taken from the viewpoint of a pedestrian. Another group of participants (control group) viewed two independent trip movies. Both groups of participants were also asked to verbally report every time they felt that it had taken 3 min while viewing the videos. The test group participants postdictively reported that the first trip was longer whereas the control group did not. Interestingly, the change of the subjective length of 3 min did not correlate with the magnitude of the return trip effect. The results show that the return trip effect can be induced in the laboratory and that the effect is not due to a change in the clock cycle. Experiment 2. A group of participants viewed a movie of an outward trip and another of a return trip through a different route. The participants still showed the return trip effect as long as they were aware that the second movie was that of a return trip. The results demonstrate that the change in the novelty of the landscape during the two moves is not a critical factor for inducing the return trip effect. Experiment 3. A group of participants viewed a movie of an outward trip twice. The second trip was felt to be shorter even when the participants viewed the same movie twice. The result clearly shows that the “return trip effect” occurs even when the second trip is not an actual “return.” Experiment 4. I also found in Experiment 2 that variance of the return trip effect can be explained by variance of sense of direction. Participants conducted a time production task of 180 s while viewing visual or listening to auditory stimuli. Their sense of direction was evaluated by using a standardized questionnaire. I found that those who have a poor sense of direction overestimated time intervals.

[Conclusion] In Experiment 1, I showed that the effect is not due to a change in the clock cycle. I further showed that the novelty of the landscape is not a critical factor (Experiment 2) and that the second trip is not required to be an actual “return” as long as the two trips were identical (Experiment 3). Based on these results, I propose that the effect is not due to an absolute change in the clock cycle but due to a change of a reference duration that is prepared before each trip, against which the passage of time is evaluated. Assuming this, the return trip effect is caused by an underestimation of the reference duration for the first trip, which is then replaced with the actual longer duration of the first trip. I conclude that this elongation of the reference duration would make the second trip feel relatively shorter than the first trip.

論文審査の結果の要旨及び担当者

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<p>論文審査の結果の要旨</p> <p>「帰り道にかかる時間は、行きよりも短く感じられる」という現象は「往復効果」と呼ばれている。本研究では、「往復効果」が生じるメカニズムを解明することを目的として一連の実験を行い、以下の点を明らかにした。1. 30分もの道のりを歩いて撮影したビデオ映像を用いて、本当に往復効果が生じることを確かめた。2. 往路と復路での主観的な「3分間」の変化、つまり脳のクロックスピードの変化では往復効果が説明できないことを発見した。3. 始点と終点と同じであることが理解されていれば、異なる経路でも往復効果が生じることを示した。往復効果には道順の同一性は必要ない。4. 同じ道のりを2回経験する場合でも往復効果が生じることを示した。つまり、「復路」であることも必要条件ではない。これらの結果から、「往復効果」は移動時間そのものの絶対的な評価が短くなるのではなく、「時間長の期待値」を基準とする相対評価の期待値が延びて短縮することによって生じる、という全く新しい仮説（相対評価仮説）を提案するに至った。この仮説は得られたすべてのデータを整合的に説明する。長い時間がかかるために定量的な研究が欠けていた「往復効果」という対象を優れたアイデアで定量的に研究し、新しい仮説を提案するに至った一連の業績は、独創的で優れており、博士号に値するものと評価する。</p>	