

Changes in the Number of Children's Daily Activities Due to Travel Between Longitudes: A Case Study

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ABSTRACT

Traveling between two points of longitude can create changes in human perception of self and environment. Our main goal in this study was to investigate the change in the number of daily activities in children after long journeys between latitudes. Among ۱۷ families, two families with ۹-year-old children, one girl and the other boy, were selected from the western and eastern cities of Iran to travel to each other's cities. After traveling between almost two longitudes, the results showed that children's time perception, waking and sleeping time, and more importantly, number of daily activities changes. In this way, the child who had traveled to the east woke up earlier after returning to his permanent place of residence, because he thought that the days were longer and showed more activities during the day than before the travel. These results can be caused by the start time and the amount of energy input to the decision-making system and change the biological clock in such a way that it affects the perception of time and the decision to perform activities during the day. The results of this study can have scientific, educational and therapeutic aspects.

Keywords: Children, Travel, Time perception, Decision making, Daily activities

۱. INTRODUCTION

We have always found recreational travel appealing, as it is often linked with the creation of challenges. Since the dawn of their evolutionary stages, humans have been journeying for various reasons, leading to significant changes in human evolution (Benítez-Burraco, ۲۰۲۱; Sharmeen et al., ۲۰۱۴). In the modern era, the reasons for travel closely resemble those of humanity's historical past in numerous instances, yet the speed and quality of travel are notably different from past times (ISMAIL et al., ۲۰۲۱; Polan & Taylor, ۲۰۲۲). The duration of a journey impacts the overall quality of the experience (Meng et al., ۲۰۱۸), however, what holds significance in today's environment is the rapidity of transportation (Pencarelli, ۲۰۲۰), and the movement in a short time between different longitudes and latitudes is due to the speed of movement (Reis et al., ۲۰۲۳).

A lot of kids share their own unique stories from their travels (Westman et al., ۲۰۲۰), and this depends on many different reasons; such as the duration of the travel (Meng et al., ۲۰۱۸), quality of travel (Dempsey et al., ۲۰۲۱), places they visit (Veitch et al., ۲۰۰۸), experience being or not being with family or friends (Hu et al., ۲۰۲۳), and many other cases.

Geographical longitude is the distance in degrees to the west -۱۸۰ degrees and to the east +۱۸۰ degrees on the Earth relative to the Prime Meridian (Greenwich Meridian in London city) that each of these distances is ۱° degrees which creates time difference to one hour, this means, if there is a place ۱° degrees to the east of the Prime Meridian (+۱°), the longitude of the sun at that point is one hour earlier than the place in the Prime Meridian (Nationalgeographic, ۲۰۲۳).

In humans, the perception of time originates in infancy, representing a rudimentary yet extensive concept (Droit-Volet, ۲۰۱۳), our understanding of the passage of time is based on comparing the hours of the day and the biological clock (Thönes & Oberfeld, ۲۰۱۵). The process of decision making, which aims to reach subjective or pre-established objectives, can be affected by how time is perceived by us (Wittmann & Paulus, ۲۰۰۸; Zakeri et al., ۲۰۲۳).

Perception of time is a vital issue for humans, and the imbalance in its perception in different people, especially people with developmental disorders, has been well proven in past research (Casassus et al., ۲۰۱۹). Therefore, each person's perception of time can change for temporary or permanent reasons (Montemayor, ۲۰۱۷; Sack, ۲۰۰۹). The perception of time during the day can be effective in the amount of activity in that day (Behm & Carter, ۲۰۲۰), and in the life span it can affect human achievements.

If the distance between the two starting and ending points of the journey is long among the geographical longitudes and the movement speed between the two points is also high, it can be effective in the imbalance of the biological clock (Janse van Rensburg et al., ۲۰۲۱). Many people have experienced this issue in their long travels, especially between geographic longitudes, which can affect their activity levels during and after traveling over a period of time (Abbott & Zee, ۲۰۲۲).

Increasing the speed of traveling between different longitudes has become a major challenge for travelers (Malichová et al., ۲۰۲۲), and if this trip has a recreational or touristic aspect, it can raise the question for the family to choose a destination in the east for this trip or a destination in the west is better and after traveling and returning to their place of residence, what effect does this travel has on their daily lives and especially on their children?

In this research, with an adventurous-creative approach, we deal with the issue of whether traveling between geographic longitudes at a high speed compared to the human historical past can affect children's time perception, waking and sleeping hours, and the number of daily activities? Because we believe that the achievements of this research can have scientific, educational, and therapeutic aspect (Afif et al., ۲۰۲۲). Therefore, we hypothesize that traveling between geographic longitudes with a time difference of more than half an hour can make a difference in children's decision to do a certain number of activities after returning to their permanent place of residence.

۱.۱ Subtitle ۱ The results of this study showed that after returning from the travel, the child from Maku city felt that the length of the days had increased, he woke up earlier and went to sleep earlier, while the child from Saravan city had the opposite results. Also, the child from Maku city had more activities after returning from the travel for at least one week than before the travel, while the child from Saravan city showed less activities during at least one week after the travel. Therefore, in short, traveling to the east then returning from there, the person feels that the length of the days has increased and he should do more activities during the weekdays.

In this discussion, an attempt is made to expand the causes of the results of this research with a bold approach, which can have scientific, educational and therapeutic aspects. In addition, it can be a start for conducting more research in this field for children with different conditions.

In regard to the time perception, it can be said that in child from Maku city, the biological clock was affected by the destination after a week of travel, and after returning to the permanent place of residence, it wakes up the person earlier and he thinks that the length of the day is too long for him, this was the opposite for the child from Saravan city (Janse Van Rensburg et al., ۲۰۲۰). For child from Maku city, this can be like starting a marten race where he has more energy, attention span at the beginning of the race and therefore feels that time is moving slowly for hem (Burr & Morrone, ۲۰۰۶).

۱.۱.۱ Subtitle ۲ A decision making system (for daily activities) cannot make a decision as a closed system, it needs a certain amount of initial energy to make this decision (like quantum system) (Yukalov & Sornette, ۲۰۰۹). Therefore, we use of this approach for analysis the higher level of activity of child from Maku city and we assume that human decision-making can function as a quantum system (Yukalov & Sornette, ۲۰۰۹), so, by starting the earlier entry of energy into the part of the brain that is effective in decision making (for activate the biological clock), the decision making system in the child has this choose that between doing more daily activities or doing fewer daily activities select more daily activities, It's like starting a Marathon

Competition, that he/she thinks has more time and he makes a program in his mind for doing more activities during the day. Additionally, the brain feels the presence of more energy to do more activities and more focusing on its goals during a day. In the same way, this could have happened opposite process for the child from Saravan city.

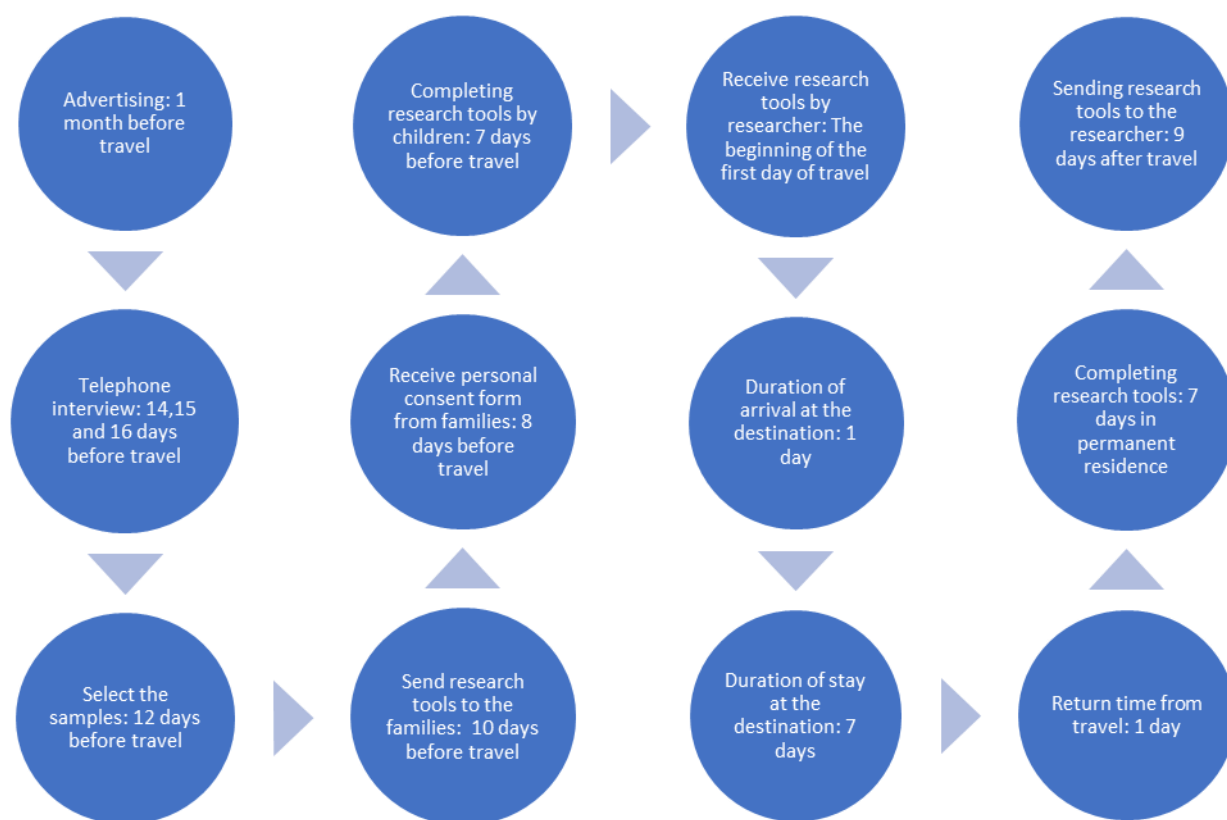


Fig. ۱. Research procedure implementation steps

Table ۱. The average Wake-up time of children from Maku city and Saravan city during a week before and after the travel

	Average wake-up time before travel	Average wake-up time after travel
Child from Maku city	۹.۱۹	۸.۴۷
Child from Saravan city	۸.۲۵	۸.۵۱

The results of Table ۱ show that the child from Maku city wakes up earlier after returning from the travel than before the travel (from ۹.۱۹ to ۸.۴۷), while the same results for the child from Saravan city show that the average wakes up time has increased and the child wakes up later (from ۸.۲۵ am to ۸.۵۱ am).

Table ۲. The average sleep time of children from Maku city and Saravan city during a week before and after the travel

	Average of sleep time before travel	Average sleep time after travel
Child from Maku city	۲۴.۲۷	۲۳.۲۱
Child from Saravan city	۲۳.۱۹	۲۳.۵۱

The results of Table ۲ show that the child from Maku city sleeps earlier after returning from the travel than before the travel (from ۲۴.۲۷ to ۲۳.۲۱), while the same results for the child from Saravan city show that the average sleep time has increased and the child sleep later (from ۲۳.۱۹ to ۲۳.۵۱).

The change in perception of the increase or decrease in the number of hours of the day, the average of this variable among children from Maku city and Saravan city in one week before and after the travel are shown in Table ۳.

Table ۳. The average results of perception of the length of a day of children from Maku city and Saravan city in a week before and after the travel

	Average perceived hours of the days of a week before travel	Average perceived hours of days one week after travel
Child from Maku city	۸	۱۴
Child from Saravan city	۱۰	۸

The results of Table ۳ show that the child from Maku felt that the number of hours in a day has increased (from ۸ hours to ۱۴ hours) after returning from a travel, while the same results show for the child from Saravan that the understanding of the hours of a day during a week has decreased (from ۱۰ hours to ۸ hours).

The change in the number of weekly activities before and after the travel and the number of weekly activities after the calculation is shown in Table ۴.

Table ۴. The results of the number of daily activities during a week of children from Maku city and Saravan city before and after the travel

	Sum of activities one week before travel	Sum of activities one week after travel
Child from Maku city	۵۴	۶۹
Child from Saravan city	۴۸	۴۲

The results of Table ۴ show that the child from Maku city did more activities after returning from the travel than before the travel (it increased from ۵۴ to ۶۹). Meanwhile, the same results show that the child from Saravan city did fewer activities after returning from the travel compared to before travel (it decreased from ۴۸ to ۴۲).

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