

別紙 4

報告番号	※	第	号
------	---	---	---

主 論 文 の 要 旨

論文題目 **A study on mode choice for young adolescents' non-school travel in Japanese rural areas and suburbia: Reevaluating independent mobility by adopting a socio-ecological approach**

(日本の地方部と郊外部における思春期の通学以外のトリップ手段選択に関する研究：自立した移動の社会生態学的アプローチによる再評価)

氏 名 KHALEGHI Marjan

論 文 内 容 の 要 旨

Societies are becoming more car-oriented, and this pattern has affected the mobility of children and adolescents worldwide. In this regard, the importance of independent mobility has been highlighted as a critical factor in bringing benefits to children/caregivers and the environment. In many western countries, there have been tremendous efforts from researchers and practitioners of a wide range of disciplines to promote active school travel by enforcing policies and taking initiatives to change the prevailing pattern of escorted car trips. Although the cultural context plays a pivotal role in the success rate of such policies, Japan is among a handful of countries that have triumphantly passed this phase, evidenced by the high rate of active school travel (over 80%) among elementary and secondary school students nationwide.

Aiming to resolve the issue of school trips and physical health may have deviated the researchers' minds from taking a comprehensive look at the mobility of children and adolescents. Non-school trips are an understudied area of research in children's and adolescents' travel behavior, which have been brought to the attention of a few experts under the term of active leisure trips. Although children at the elementary school level are usually not public transport users, and their mobility is limited to active and escorted trips, the existing literature mainly fails to recognize the importance of public transport for adolescents' mobility. Early adolescence, in particular, is when children start using public transport. This service is more critical for young adolescents living in suburbs and rural areas since, due to the burdens of the environment, active modes cannot solely accommodate young adolescents' mobility/accessibility needs. Also, there is limited evidence of the effect of different factors on mode choice for non-school trips among the mentioned group.

Based on the points mentioned above, this study intends to address the gaps in the literature by delving deep into the nature of non-school trips among young adolescents (12-15) in the context of three case studies

in Japan (one suburb and two rural areas). The socio-ecological approach was applied as the theoretical basis of this study to explore the multi-level factors involved in choosing different means of transport. This approach represents a robust background in investigating the impacts of the different levels (individual, family, the natural/physical built environment, policy) on young adolescents' travel behavior. The critical value of taking children as agents in their mobility, especially in the transition phase of early adolescence, burdens of the natural/physical environment in rural areas, and the lack of a holistic perspective on the nature of young adolescents' non-school trips and the influential underlying predictors of mode choice, have inspired the researcher to undertake this study.

Qualitative and quantitative research approaches were applied to fulfill the purpose of this study. Firstly, exploratory interviews were conducted in two towns to gain a preliminary perspective on young adolescents' mobility in the case studies. The results of this phase were later reflected in designing the questionnaires and travel diaries. Four hundred and eighty-seven adolescents and their caregivers in three small towns (suburban, coastal, and mountainous contexts) participated in the quantitative survey by filling out questionnaires. Young adolescents also reported 2131 non-school trips in the travel diaries in all the case studies. Apart from the descriptive statistics, the data were analyzed using McFadden's discrete choice modeling (conditional logit) for each case study. A general model was also developed by including the data of all three towns. In addition to the exponentiated coefficients, margins were calculated for the choice models to understand and interpret the results more intuitively applicable to policymaking.

The researcher found that young adolescents' independent mobility (a solo trip or in the company of friends/siblings) translates to walking/cycling and public transport trips in the case studies. However, private cars are the most common means of transport for young adolescents' non-school travel, with around 50% and 70% share in the suburb and rural settings. The results of the logit models and the predictive margins revealed relatively different patterns in the three case studies, highlighting the role of the natural/physical environment in young adolescents' non-school mobility. In the individual models, socio-demographic characteristics (such as adolescents' age, caregiver's age/occupation and number of children per household, etc.) were more influential in selecting walking/cycling or public transport over the car, followed by the moderate effect of the perceived consent about independent mobility range and psychological variables such as self-efficacy and social support (received from caregivers and friends). Higher neighborhood safety was only found effective in elevating the odds of active non-school travel against escorted car trips in one of the rural areas. The findings of the general model were pretty much the combination of the separate models' results. Apart from the independent mobility variables (insignificant in the general model), the same influence degree pattern seen in the separate models was observed in the general model. Also, mode-specific perceived benefits and friends' social modeling were exclusively found effective in the estimation of

mode choice in the general model.

In one of the rural areas, there was a mismatch between students' perceptions and their caregivers' image of the independent mobility distance range. Surprisingly, the effect of caregivers' opinions on their children's mode choice was counterintuitive, which reflects a lack of consciousness toward the independent mobility of young adolescents among families. Also, young adolescents used the consent for cycling on main roads differently in the suburb compared to rural areas, which was interpretable based on the different attributes of non-school travel, such as trip distance observed in these contexts. For instance, the complementary link of cycling trips and public transport was observed in the suburb (more similar to urban areas). In contrast, trips had a distinctive nature in the rural areas, and cycling could be used as the main/only mode of transport.

In conclusion, the results lead to a better understanding of young adolescents' non-school travels and the determinants of independent mobility among them in each context. The findings also emphasize the significant influence of caregivers/households and friends on the use of different modes for realizing non-school travel in the mentioned age range. Town-specific and general proposed policies can be reflected in each setting, benefiting individuals (the young adolescents and their caregivers) and towns by promoting more environmentally-friendly modes of transport and altering the households' mobility behavior in the long run.

Raising awareness regarding the significance of independent mobility among young adolescents and elevating the perceived capability for traveling independently by incentivizing fun joint trips with parents/grandparents, particularly for girls who seem to have more car-prone tendencies, is one of the suggestions. Additionally, developing trip planning apps for young adolescents could make non-school trip making easier (specifically independent travel). Besides building a network with friends who have similar hobbies, such apps can also be used to share virtual travel diaries among the same group to promote independent mobility. These virtual platforms can also become a source of collecting detailed longitudinal data on children's travel for experts. Building a continuous partnership with young adolescents could also be very helpful in appraising their mobility needs and views. Other initiatives such as providing public transport tickets for specific household types (e.g., younger families or those with multiple children) could also be considered. Overall, policy implications should be implemented at the level of young adolescents/families considering the characteristics of the physical/natural environments.

Keywords: Young Adolescents, Independent Mobility, Walking/Cycling & Public Transport, Non-School Trips, Rural Areas and Suburbia, Japan, Socio-Ecological Approach, McFadden's Discrete Choice Model, Conditional Logit