

Comparison of salient beliefs across different levels of leisure time physical activity among university students

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Abstract:

The present study is the first in the field of physical activity research to systematically compare the findings of an elicitation study on leisure-time physical activity between individuals classified as physically active and physically inactive. The primary aim of this study was to compare leisure-time physical activity beliefs between South Korean university students classified as active and inactive based on whether they meet the recommended physical activity levels. The objective was to identify key differences and investigate potential reasons for these differences. To address this aim, the study employed two separate elicitation interviews focused on identifying modal salient beliefs regarding leisure-time physical activity. Participants were classified into active and inactive groups based on their self-reported leisure-time physical activity. The active group was defined as those engaging in at least 150 minutes of leisure-time physical activity per week, while the inactive group reported less than this amount. Beliefs cited by more than 30% of the sample were deemed modal salient. Data analysis uncovered marked disparities in the beliefs held by active versus inactive students, demonstrating that the cognitive structures concerning leisure-time physical activity are heterogeneous across these two groups. Such variations likely stem from the inherent characteristics distinguishing the two groups, as well as their divergent histories of engagement with leisure-time physical activity. The findings suggest that active and inactive students hold distinct belief structures regarding leisure-time physical activity. Future elicitation studies should explicitly compare these groups to better identify factors that could promote physical activity participation among inactive individuals.

Key Words: Theory of Planned Behavior (TPB), Elicitation Study, Salient Beliefs, Leisure-time Physical Activity, University Students

Introduction

The Theory of Planned Behavior (TPB) is widely utilized for forecasting or altering physical activity-related behaviors such as exercise, walking, sports participation, and leisure-time physical activity (McEachan et al., 2011). Previous reviews of TPB studies have provided cluding physical activity (McEachan et al., 2011). Support for TPB in the domain of physical activity is robust across diverse populations, ranging from young adults to individuals with health conditions such as cancer patients (Hagger et al., 2002; McEachan et al., 2011). Within the framework of the Theory of Planned Behavior (TPB), behavioral intention is identified as the immediate precursor to action (Ajzen, 1991). This intention is contingent upon three distinct constructs: attitude toward the behavior, subjective norms, and perceived behavioral control. Furthermore, Ajzen (1991) emphasizes that a robust understanding of behavior requires analyzing the underlying cognitive structures—specifically behavioral, normative, and control beliefs. These are collectively termed 'salient beliefs' and serve as the foundational antecedents determining attitude, subjective norms, and perceived behavioral control, respectively. Therefore, it is strongly recommended that researchers and practitioners identify salient beliefs about the specific behavior within the target population before developing behavior change programs (Ajzen, 1991; Van Der Pligt & De Vries, 1998). To identify these salient beliefs, researchers must survey a representative sample of the target demographic. This process typically involves administering open-ended interview questions, after which the gathered responses undergo content analysis (Darker & French, 2009). Any belief cited by at least 30% of the participants is categorized as part of the 'modal set.' These frequently reported beliefs then form the basis for constructing quantitative survey instruments (Fishbein & Ajzen, 1975).

Identifying the most prevalent beliefs about exercise across diverse populations is essential, as attitudes and thoughts regarding exercise may vary among different populations (Downs & Hausenblas, 2005a). While an elicitation method is crucial for providing researchers with significant insights into the cognitive foundation of behavior within a specific population, most exercise studies utilizing the TPB are conducted without it (Downs & Hausenblas, 2005b). Furthermore, even within exercise research that employs elicitation protocols, the

specific behavioral phase is frequently overlooked during the data collection process. It is important to identify discriminating beliefs between those who engage in the behavior and those who do not when conducting an elicitation study. Previous study explained that knowing who does and does not engage in a specific behavior during the elicitation process allows preliminary analyses to identify the differentiating factors that need to be addressed for a behavior change intervention (Middlestadt et al., 1996).

Based on our literature review, there are only two TPB studies that considered the behavioral phase during the elicitation study. Zhang et al. conducted an elicitation study to identify salient beliefs about physical activity among middle school students from two middle schools in Beijing, China (Zhang et al., 2007). After conducting content analysis, they performed chi-square analysis to determine if there were significant differences in salient beliefs between students who engage in physical activity and those who do not. Since they found no significant differences between these two groups, the results of the elicitation study are presented for the entire sample of students. Previous study undertook an elicitation process at two national parks to identify the salient beliefs underlying the use of shuttle buses for reducing the pressures created by a growing number of vehicles (Curtis et al., 2010). They intentionally included both shuttle bus users and private car users in the elicitation study to gain preliminary insights into the beliefs that may differ between these two groups. A comparative analysis of the beliefs held by bus users versus car users yielded preliminary insights into the underlying beliefs that may differentiate between these two user groups.

To our knowledge, no study has reported the results of elicitation studies separately by behavioral phase within the domain of physical activity. Given that the classification of modal salient beliefs relies on a specific frequency threshold (commonly 30%), it is anticipated that distinct belief sets will emerge across different behavioral stages. Consequently, within the context of physical activity research, it is imperative to implement elicitation studies that explicitly contrast individuals meeting activity guidelines with those who fall short. Such comparative analyses are crucial for pinpointing determinants that could foster greater engagement among the inactive population. Therefore, in the current study, we compared the results of an elicitation study on leisure-time physical activity among university students across different behavioral phases (i.e., insufficient participants and sufficient participants) to determine whether there are significant differences across these phases and to explore the reasons for any observed differences. This will also provide essential foundational data for designing more effective behavior change interventions for inactive university students.

Material & methods

Following the procedure outlined by Fishbein and Ajzen (Fishbein & Ajzen, 1975), To isolate modal salient beliefs, two distinct elicitation phases were implemented involving university students in South Korea. Following the criteria set by Darker and French (2009), subjects were stratified into 'active' (accumulating 150 or more minutes of weekly leisure-time physical activity) and 'inactive' groups (accumulating less than 150 minutes of leisure-time physical activity). Recruitment was facilitated by trained graduate personnel at same university, where written informed consent was secured from all individuals prior to data collection. The study received approval from the Seoul National University Institutional Review Board (IRB No. 2406/002-009).

A total of 34 active students and 37 inactive students were randomly recruited to participate in semi-structured interviews. These interviews comprised six open-ended questions regarding participation in leisure time physical activity as shown in Table 1. To maximize the range of responses, the think-aloud method was employed, encouraging students to articulate as many factors as possible influencing their participation in leisure time physical activity under each TPB construct (Darker & French, 2009). The elicitation process continued until data saturation was achieved. Participants also reported their minutes of leisure time physical activity during the past week, as well as their gender, age, and academic department. All survey data were collected in June 2024 to avoid the potential impact of extreme temperatures in July and August, which could adversely affect students' participation in physical activity in South Korea.

Table 1 *Open-ended Questions Utilized in the Current Study.*

Behavioral Belief Questions:	
1.	What do you believe are the advantages of engaging in leisure time physical activity more than 150 minutes a week?
2	What do you believe are the disadvantages of engaging in leisure time physical activity more than 150 minutes a week?
Normative Belief Questions	
3	Are there any individuals or groups who would approve of your participation in leisure time physical activity for more than 150 minutes a week?
4	Are there any individuals or groups who would disapprove of your participation in leisure time physical activity for more than 150 minutes a week?
Control Belief Questions	
5	What factors or circumstances would enable you to participate in leisure time physical activity for more than 150 minutes a week?
6	What factors or circumstances would make it difficult or impossible for you to participate in leisure time physical activity for more than 150 minutes a week?

Responses were recorded verbatim as field notes during each interview. Initially, the field notes were converted into a tabular format for easier analysis. Adhering to the methodological framework established by Bryman et al. (2003), the research team—including authors and field collectors—scrutinized the raw data to consolidate individual responses into broader, manageable classification themes. This process involved identifying latent patterns and recurring concepts. Subsequently, a content analysis was performed to calculate the frequency of these belief categories. To ensure reliability, only items achieving consensus among a minimum of three investigators were retained in the final pool of elicited beliefs (Bryman et al., 2003). Beliefs mentioned by more than 30% of the participants were identified as modal salient beliefs.

Results

The demographic characteristics of participants are presented in Table 2. While the mean age remained consistent across both groups, a significantly larger proportion of female students was observed in the inactive category. In terms of physical activity volume, the inactive group averaged approximately 59 minutes weekly, in sharp contrast to the active group, which recorded an average of 331 minutes. Table 3 outlines the beliefs reported by at least 30% of the participants. Specifically, seven behavioral beliefs regarding the pros and cons of meeting the 150-minute threshold were identified as modal salient among active students. The top three behavioral beliefs were: 'improves physical fitness' (61.76%), 'causes fatigue' (55.88%), and 'causes a lack of time' (47.06%). Although there are substantial differences in the percentages of each behavioral belief between active and inactive students, these three behavioral beliefs were also identified as the most salient among inactive students. Other behavioral beliefs identified among active students, such as 'enhances appearance' (41.18%), 'improves mental health' (38.24%), 'improves physical health' (32.35%), and 'causes injury' (32.35%), were not mentioned by more than 30% of inactive participants.

Table 2 *Demographic Characteristics of Participants by Behavioral Phase (N = 71)*

Characteristics	Active students (n = 34)	Inactive students (n = 37)
Female (%)	34.29	51.35
Age (mean)	22.09	21.89
Minutes of leisure time physical activity (mean)	330.59	58.89

Note. Active students are those who engaged in at least 150 minutes of leisure time physical activity in the past week, while inactive students are those who engaged in less than 150 minutes of leisure time physical activity in the past week.

Regarding the normative beliefs associated with engaging in leisure-time physical activity for more than 150 minutes per week, three beliefs emerged as the most prominent among active students. These beliefs were: 'friends approve' (52.94%), 'parents approve' (32.35%), and 'other family members approve' (32.35%). Although there are variations in the percentages of these normative beliefs between active and inactive students, two of these three beliefs ('friends approve' and 'parents approve') were also mentioned by more than 30% of inactive participants. 'Good accessibility to exercise facilities' was the most frequently cited control belief (38.24%) among active students regarding factors that facilitate engaging in leisure-time physical activity for more than 150 minutes per week, followed by 'having an exercise partner or a sports club' (32.35%). In terms of barriers, 'lack of time' was reported by 67.65% of active students. Among inactive students, 'good accessibility to exercise facilities' (43.24%) and 'lack of time' (67.57%) were the only control beliefs mentioned by more than 30% of participants.

Table 3 *Beliefs Mentioned by more than 30% of the Participants among both Active and Inactive Students*

Active students	Inactive students
Behavioral beliefs (%)	Behavioral beliefs (%)
- Improves physical fitness (61.76)	- Improves physical fitness (70.27)
- Causes fatigue (55.88)	- Causes fatigue (64.86)
- Causes a lack of time (47.06)	- Causes a lack of time (32.43)
- Enhances appearance (41.18)	
- Improves mental health (38.24)	
- Improves physical health (32.35)	
- Causes injury (32.35)	
Normative beliefs (%)	Normative beliefs (%)
- Friends approve (52.94)	- Friends approve (54.05)
- Parents approve (32.35)	- Parents approve (37.84)
- Other family members approve (32.35)	
Control beliefs (%)	Control beliefs (%)
- Lack of time makes it difficult (67.65)	- Lack of time makes it difficult (67.57)
- Good accessibility to exercise facility makes it easy (38.24)	- Good accessibility to exercise facility makes it easy (43.24)
- Having an exercise partner or a sport club makes it easy (32.35)	

Note. Active students are those who engaged in at least 150 minutes of leisure time physical activity in the past week, while inactive students are those who engaged in less than 150 minutes of leisure time physical activity in the past week.

Discussion

The present study compared the findings of an elicitation study on leisure-time physical activity between active and inactive university students to investigate potential differences across behavioral phases and to explore the underlying reasons for any observed discrepancies. Some noticeable differences in beliefs were observed, highlighting that active and inactive university students do not share a homogenous belief structure regarding participation in leisure-time physical activity.

The differences in underlying belief structures may be influenced by the distinct characteristics of active versus inactive students. One prominent belief that emerged exclusively among active students was 'having an exercise partner or a sport club makes it easy.' This belief indicates that more active students are likely already involved in team sports or activities that require exercise partners. Jakobsen (Jakobsen, 2014) has demonstrated that individuals participating in team sports tend to exhibit higher intrinsic motivations, such as interest and enjoyment in sports, compared to those who engage in individual sports. Interest and enjoyment in sports are crucial factors that foster lifelong participation in physical activity. Previous studies indicated that individuals engaged in team sports typically accrue more minutes of physical activity compared to those participating in individual sports (Kudlacek, 2021; Pharr et al., 2019; Tammelin et al., 2003). However, enhancing intrinsic motivation among inactive individuals poses a challenge, as they often exhibit distinct characteristics compared to their active counterparts. Therefore, utilizing social facilitators—such as having an exercise partner or joining a sports club—may prove challenging when designing interventions for sedentary populations. The disparity in belief structures between the two groups likely stems from the active students' more extensive history of engagement in leisure-time physical activity. Notably, four behavioral beliefs were exclusive to the active cohort: 'enhances appearance', 'improves mental health', 'improves physical health', and 'causes injury'. These factors are inherently linked to long-term participation, as physiological changes and injury risks typically manifest only after sustained activity. Unlike the control belief that having an exercise partner or being part of a sports club facilitates engagement in physical activity, these experiential outcomes remain largely abstract or unknown to inactive individuals due to their lack of exposure. Therefore, interventions designed to help inactive individuals recognize some of these lesser-known beliefs may effectively increase their participation in physical activity. Another salient belief identified exclusively among active participants is the normative belief that other family members endorse their engagement in leisure time physical activity. This finding aligns with previous research indicating that social norms exert a positive influence on physical activity behavior (Abraído-Lanza et al., 2017; Ball et al., 2010; Emmons et al., 2007). Subjective norms can be categorized into injunctive and descriptive qualities. Injunctive norms refer to perceptions of significant others' approval or disapproval, while descriptive norms pertain to perceptions of the actual behaviors of significant others (Ajzen, 2006; Rhodes & Mark, 2012). It is unlikely that parents disapprove of their children participating in physical activity, as such behaviors are not harmful to health and do not have direct negative effects on others. Parents, therefore, may influence their children's physical activity behavior in an injunctive manner. In contrast, other family members (e.g., grandparents and siblings), aside from parents, may exert influence in a descriptive manner rather than an injunctive manner, as they are likely to be less concerned about the participants' activities compared to the participants' parents. Many active participants in the current study may come from families in which most members engage in regular physical activity. A recent review indicated that descriptive norms are a stronger factor for behavior change in the physical activity domain compared to injunctive norms (Kim et al., 2019). Physical activity interventions could benefit from targeting participants' descriptive norms by promoting the physical activity of their family members.

Conclusions

The present study has several limitations. First, while Fishbein and Ajzen (Ajzen, 1980) indicated that a small convenience sample is suitable for elicitation studies, this raises questions about the representativeness of the beliefs within the wider population. Nonetheless, these concerns may be mitigated by achieving response saturation during the data collection process. Second, the reliance on subjective self-reporting to assess leisure-time physical activity renders the data susceptible to recall and response biases. To mitigate these inaccuracies, the incorporation of objective measurement tools would have been advantageous (Newell et al., 1999). Third, given the heterogeneous nature of leisure-time physical activity, a simple aggregate measure fails to capture the aspects of specific activities. Consequently, subsequent investigations should aim for more granular measurement protocols to deepen the understanding of salient beliefs among the university students. Finally, the findings of this study may not be generalizable to all South Korean university students, as the sample was limited to a single university in South Korea. Notwithstanding these constraints, this research represents a pioneering effort within the physical activity domain to explicitly contrast the elicitation results of individuals adhering to activity guidelines versus those who do not. The results of this study confirm that cognitive frameworks regarding leisure-time physical activity are fundamentally distinct between active and inactive groups. Consequently, future elicitation research must prioritize this direct comparison. Such an approach is vital for isolating the specific determinants that could foster engagement among the inactive population.

Conflicts of interest - Nothing to declare.

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