

## DOCTORAL THESIS

### Fluctuation: a common but neglected phenomenon of physical activity behavior

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## ABSTRACT

**Introduction:** Benefits of regular physical activity (PA) behavior are well-established, yet still many people do not regularly participate in PA. Given this, researchers proposed a PA pattern named “fluctuation” to refer to a phase of sporadic, unstable, or irregular participation in PA behavior. The person who demonstrates the pattern of irregular PA participation is named “fluctuator”. So far, research particularly focusing on PA fluctuation and fluctuators is scarce.

**Purpose:** The main purpose of the thesis was to review and explore the psychosocial and behavioral characteristics of PA fluctuators.

**Methods and Results:** An exploratory systematic review was firstly conducted in the literature review section. The results showed that fluctuation was mostly defined as a PA stage from the perspective of stage theory and measured by stage algorithms. Common features were extracted from the conceptual definitions as: behavioral irregularity, high risk of drop-out, intention to PA, low habit level, and limited self-regulation. A sequential mixed-methods design consisting of a quantitative study and a qualitative study was subsequently conducted. The quantitative study adopted the design of cross-sectional questionnaire survey. By using the latent profile analysis, 434 fluctuators ( $M = 32.4$  years,  $SD = 6.9$ , 55.5% female) from office-based settings were categorized into two profiles of “uncommitted fluctuator” and “moderately committed fluctuator” based on psychosocial indicators. The results from multinomial logistic regression showed that the “moderately committed” profile was associated with more PA energy expenditure, a normal weight range, and a medium managerial position compared with the uncommitted profile. The qualitative study employed the design of “Research Program Subjective Theories” to explore and present fluctuators’ cognitions concerning PA participation. 30 interviewees ( $M = 35.2$  years,  $SD = 9.3$ , 53.3% female) from the previous quantitative study were invited for semi-structured interview. By inductive and deductive coding, fluctuators’ verbal data were converted into word categories for extracting commonalities and comparing differences. By remaining word categories of high frequency and exploring the interrelationships among the remained word categories, a superstructure (i.e. visualized representation of fluctuators’ overall cognition) including fluctuators’ main PA motivators, barriers, and behavioral outcomes was compiled. Fluctuators’ cognitions were primarily differed in motivational configurations. The physically motivated fluctuators (i.e. those predominantly motivated by physically related motivators) were more linked with low PA level, while the mixed motivated fluctuators (i.e. motivated by both physically related and emotionally or socially related motivators) were more likely associated with moderate PA level. Exemplars of the typical fluctuators were also demonstrated in

the end of the qualitative study to reveal their real experiences and situations in the daily life context.

**Discussion and Conclusions:** To the best of our knowledge, the present research is the first-ever exploration of the psychosocial and behavior features among PA fluctuators. The findings of this thesis revealed that PA fluctuators are common in context; they are planless, motivationally and behaviorally heterogeneous, limited in self-regulation, and impeded by unfavorable circumstances in doing PA. The quantitative study and the qualitative study complement each other and jointly facilitate the understandings of the variability and heterogeneity in fluctuators' psychosocial profiles. Particularly the uncommitted fluctuators in the quantitative study are more likely to be physically motivated fluctuators than mixed motivated fluctuators in the qualitative study, and moderately committed fluctuators are more likely to be mixed motivated fluctuators than physically motivated fluctuators. The present thesis provided an important opportunity to advance the knowledge development regarding the topic of PA fluctuation. Based on the current findings, future interventions to promote fluctuators' regular PA participation are promising.

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