

ESSR Journal Club

Covered Article: “Engineering Person-Specific Behavioral Interventions to Promote Physical Activity”

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- 1) How can the increased availability of intensive longitudinal data from activity monitors be leveraged to improve *theories* of physical activity and *behavioral interventions* for increasing physical activity?
- 2) What challenges await researchers who seek to capitalize on intensive longitudinal data from physical activity monitors?
- 3) How do theories and conceptual models of physical activity differ from computational models?
- 4) In general, how does the control systems engineering perspective on behavior change differ from conventional theories of physical activity?
- 5) Which common theories of physical activity appear amenable to system identification modeling?
- 6) Which intervention components would you implement in an “open-loop” study of daily physical activity (i.e., non-adaptive intervention)? How would the way one schedules when to deploy and/or withdraw these components influence inferences that could be made about their influence on behavior?
- 7) Other than the day-of-week, what kinds of non-modifiable contextual information might be useful for increasing the specificity of predictions about intervention responses?
- 8) What features of impulse response and cumulative response curves following micro-interventions (Fig. 3) would you prioritize when developing a person-specific messaging algorithm? Should other features of these responses be considered?
- 9) If computational modeling advances lead to person-specific intervention approaches becoming more common, who is likely to benefit most from those interventions?
- 10) How might bias be embedded in the computational approaches to intervention development described in this article? What steps should researchers take to ensure that their computational work is promoting health equity?
- 11) What contrasts differentiate the system identification-control engineering approach to physical activity interventions from computer science-based approaches, such as machine learning?