City Research Online

City, University of London Institutional Repository

Citation: Presseau, J., Tait, R., Johnston, D., Francis, J. and Sniehotta, F. F. (2012). Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology, 32(12), pp. 1179-1187. doi: 10.1037/a0029430

This is the accepted version of the paper.

This version of the publication may differ from the final published version.

Permanent repository link: https://openaccess.city.ac.uk/id/eprint/13027/

Link to published version: http://dx.doi.org/10.1037/a0029430

Copyright: City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

Reuse: Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

City Research Online: http://openaccess.city.ac.uk/ publications@city.ac.uk

Goal Conflict and Goal Facilitation as Predictors of Daily Accelerometer-assessed Physical Activity

Justin Presseau
Newcastle University

Richard I. Tait, Derek W. Johnston and Jill J. Francis
University of Aberdeen

Falko F. Sniehotta
Newcastle University

Author Note

Justin Presseau and Falko F. Sniehotta, Institute of Health and Society, Newcastle University, UK; Richard I. Tait and Derek W. Johnston, School of Psychology, University of Aberdeen, UK; Jill J. Francis, Health Services Research Unit, University of Aberdeen, UK.

This research was supported by grants from the University of Aberdeen Development Trust and the Improved Clinical Effectiveness through Behavioural Research Group. The authors would like to thank Marie Johnston and Rebecca Lawton for comments provided on earlier drafts. This article is based on data reported in the first author's doctoral dissertation.

Correspondence concerning this article should be addressed to Justin Presseau, Institute of Health and Society, Newcastle University, Baddiley-Clark Building, Richardson Road, Newcastle Upon Tyne, NE2 4AX, England. Email: justin.presseau@ncl.ac.uk

Presseau
J,
Tait
R,
Fr?? ? ? ?
?????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Abstract

Objective: To test whether perceptions of conflicting and facilitating personal goals, and actual daily time spent in their pursuit, predict accelerometer-assessed physical activity (PA). Methods: A prospective multi-level design with a daily accelerometer-based assessment of PA over one week was used (*N*=106). Participants' personal goals were elicited using personal projects analysis. Participants then rated their personal goals in terms of how they were perceived to facilitate and conflict with their regular PA. Items assessing PA-specific intention and perceived behavioral control (PBC) were also embedded within the baseline measures. For the subsequent seven consecutive days, participants completed a daily diary based on the day reconstruction method, indicating the time spent in daily episodes involving each of their personal goals, and wore an RT3 tri-axial accelerometer. The main outcome was accelerometer-assessed daily time spent in moderate to vigorous physical activity (MVPA). Results: Random intercept multilevel models indicated that perceived goal facilitation, but not perceived goal conflict, predicted MVPA over and above intention and PBC. Daily time pursuing conflicting goals negatively predicted MVPA when subsequently added to the model and in so doing, attenuated the association between perceived goal facilitation and MVPA. Conclusion: Perceived goal facilitation predicts objectively measured PA over and above intention and PBC, but daily time spent in pursuit of conflicting personal goals provides a better account of how alternative goals relate to engaging in regular PA.

Keywords: goal conflict, goal facilitation, physical activity, theory of planned behavior, accelerometer

Goals are rarely pursued in isolation. Characteristically, individuals pursue numerous personal goals across the various contexts in their lives [pic](Cantor et al., 1991; Emmons, 1986; Little, 1983). Goal pursuit typically requires and is constrained by available resources (e.g., time, energy and money). The pursuit of multiple goals in daily life thus involves a degree of goal competition for these limited resources (Kruglanski et al., 2002). Such goal competition may lead to situations in which goals conflict, hindering one another's pursuit (Emmons, 1986; Wilensky, 1983). Goal conflict involves inherent incompatibility between goals (e.g., speed versus accuracy) or competition for existing resources [e.g., 'working at a part-time job' might conflict with participating in regular physical activity (PA) by consuming available time and energy; Riediger & Freund, 2004]. Personal goals can also complement one another and involve facilitating goal relations, whereby pursuit of some personal goals helps in the pursuit of others (Little, 1983; Wilensky, 1983). Goal facilitation reflects instrumentality between goals (e.g. 'working at a part-time job' can facilitate participating in PA by providing the resources to pay for physically active hobbies) or goals that share a common means of pursuit (e.g., 'going to school' and 'participating in regular PA' may facilitate each other if commuting to school involves cycling; Riediger & Freund, 2004) . Together, perceived goal conflict and facilitation indicate how an individuals' goal system affects their pursuit of a given personal goal (Kruglanski, et al., 2002; Riediger, 2007).

Consideration for the conflicting and facilitating relations in individuals' goal system may help to better understand the pursuit of health-related behaviors. Participation in regular PA is

??????†??????????????????/????????????????
widely recommended across evidence-based guidelines to promote health and reduce health risks (National Institute for Health and Clinical Excellence, 2006). However, only a third of adults reported meeting guideline recommendations (Corbett et al., 2010). The aim of this study was to investigate whether perceptions of conflicting and facilitating goals, and time spent in their pursuit, predict daily PA.

Goal Conflict and Goal Facilitation

Investigating goal conflict in relation to PA, Gebhardt and Maes (1998) showed that inactive individuals reported more conflicting goals than did their more active counterparts. Compared to active individuals, inactive individuals value and regulate their conflicting goals more than their PA (Karoly et al., 2005), tend to be less confident in their ability to pursue both their PA and most valued non-PA goal and perceive them as less facilitative (Jung & Brawley, 2010). This body of work highlights a potential relationship between goal conflict and PA but is limited by cross-sectional designs, self-reported PA and dichotomized outcomes. Prospective predictive studies to date have found a relative lack of support for a relationship between perceived goal conflict and PA, with three independent studies failing to show a significant relationship between goal conflict and PA [pic](Li & Chan, 2008; Presseau, Sniehotta, Francis, & Gebhardt, 2010; Riediger & Freund, 2004). While suggestive of little evidence for a relationship between perceived goal conflict and PA, evidence from functionally similar constructs suggests otherwise. For example, daily hassles, conceptualized as minor stresses arising in daily life, have been associated with health-related behaviors such as unhealthy eating behaviors, in particular within individuals (Conner, Fitter, & Fletcher, 1999; O'Connor, Jones, Conner, McMillan, & Ferguson, 2008). While the content of daily hassles differs from goal conflict, both constructs are functionally similar in their potentially detrimental influence on a focal behavior by consuming available resources (e.g., time and energy). The literature on job demands also shares (context-specific) functional similarities with goal conflict. Payne, Jones and Harris (2010) showed that individuals are less likely to translate their intention into PA on days when they perceive job-related demands to be higher, despite their perceived behavioral control (PBC). Job demands can be conceptualized as including goals that compete for limited resources. However, not all job demands are necessarily negative (conflicting) in nature, nor do job demands necessarily cover all personally-relevant goals. The evidence from these related literatures suggests that goal conflict may account for variability in PA, in particular at a within individual level. Given the idiosyncrasies of individual goal systems (Little, 1983) and intra-individual evidence from the job

Presseau
J,
Tait
R,
Fr?? ? ? ?
??????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Presseau
J,
Tait
R,
Fr?? ? ? ?
????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

demands and daily hassles literatures, within-subjects approaches may provide a more appropriate test of the relationship between goal conflict and PA.

Relative to goal conflict, comparatively less research attention has focused on goal facilitation. Goal facilitation has predominantly been viewed as the opposite end of the goal conflict spectrum on a bipolar scale (Riediger, 2007). When measured independently, factor analytic evidence and predictive tests have demonstrated the discriminant construct validity of these two distinct constructs (Presseau, et al., 2010; Riediger & Freund, 2004). Prospective predictive studies have shown that perceptions of goal facilitation predict self-reported (Presseau, et al., 2010) and proxy objective measures (gym attendance; Riediger & Freund, 2004) of PA. A secondary aim of this study was to test whether such effects remain robust when predicting direct objective data of PA collected with accelerometers.

Cognitive assessments of perceptions of goal facilitation and goal conflict provide an indication of the personal goals viewed to help and hinder one another. However, perceptions say little about the frequency with which conflicting and facilitating goals are pursued in everyday life. The distinction between the two may be important. For instance, ‘going on holiday’ may be an important personal goal and perceived to conflict tremendously with PA. However, if ‘going on holiday’ is pursued only once a year, the daily time spent ‘going on holiday’ is unlikely to have much conflicting impact on PA, except for the acute conflict at the one time of year when on holiday when daily time is consumed by this goal. Similarly, ‘meeting friends’ may only be perceived to moderately conflict with PA but if this conflicting goal consumes a lot of daily time, this may impact on PA. Furthermore, ‘going to work’ may not necessarily be perceived as having a strong facilitating effect on engaging in PA. However, if ‘going to work’ involves riding a bicycle or walking to commute on a daily basis for thirty minutes, regular pursuit of this facilitative goal may have a strong relationship with PA. Goal conflict and facilitation can also be assessed behaviorally, by investigating the time spent pursuing goals that conflict with and facilitate PA over time. Behavioral assessments of goal conflict and facilitation have been shown to relate to cognitive assessments of perceived goal conflict and facilitation (Riediger & Freund, 2004). As the behavioral measures of goal conflict and facilitation provide an indication of the resources consumed or provided by the pursuit of other goals, variability in behavioral assessments of goal conflict and facilitation may predict PA differently than cognitive assessments. The present study therefore also aimed to test whether the pursuit of facilitating and conflicting goals predicts PA.

??????†???????????????????/????????????????

Towards Cumulative Theoretical Development

The literature is rife with theory-based constructs predicting behavior. Promoting a cumulative science should involve testing novel theoretical predictors of behavior (such as goal conflict and facilitation) against existing well-evidenced theoretical accounts of behavior (Noar & Zimmerman, 2005). Intention and PBC from the theory of planned behavior (TPB; Ajzen, 1991) have been consistently shown to predict PA, together accounting for a quarter of the variance in PA between individuals across studies (McEachan, Conner, Taylor, & Lawton, 2011). The consistently observed relationship between intention, PBC and PA argues in favor of their inclusion when predicting PA. However, identified limitations to the TPB, such as its focus on single goal-directed behaviors isolated from the wider context of multiple goal pursuit, argue against the sufficiency of behavior-specific intention and PBC (Abraham & Sheeran, 2003). Indeed, Rhodes and Blanchard (2008) showed that extending the TPB to consider intention for a competing sedentary behavior (watching television) predicted variability in self-reported PA over and above PA-specific intention and PBC. Individuals' goal systems are likely composed of many more personal goals than watching TV, each potentially facilitating and conflicting with PA. When considered alongside PA-specific intention and PBC from the TPB, perceived goal facilitation has been shown to predict PA above and beyond the TPB constructs (Presseau, et al., 2010). However, it is not clear whether this relationship is robust in predicting objective accelerometer-assessed levels of PA. On the basis of existing prospective evidence (Li & Chan, 2008; Presseau, et al., 2010; Riediger & Freund, 2004), it was hypothesized that perceived goal facilitation (but not perceived goal conflict) will predict accelerometer-assessed PA over and above intention and PBC. It is also not clear whether behavioral indicators of goal conflict and goal facilitation improve upon this prediction. It was hypothesized that the pursuit of conflicting and facilitating goals will predict additional variability in accelerometer-assessed PA over and above baseline intention and PBC, and perceived goal facilitation and perceived goal conflict.

Method

Participants, Procedure and Materials

Participants were a sample of undergraduate and graduate students. Prospective participants were individually introduced to the study by a member of the study team outside of class time and were offered a personalized printout of their accelerometer-assessed MVPA as an

Presseau
J,
Tait
R,
Fr?? ? ? ?
???????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Presseau
J,
Tait
R,
Fr?? ? ? ?
????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

incentive to participate. No other incentive was used and participants were not sampled on the basis of any pre-existing levels of MVPA. Those interested in participating were then sent an email with an informed consent sheet and an invitation to complete baseline measures (included as an attachment to the email). The baseline questionnaire was completed within a *Microsoft Excel*-based procedure originally developed by Little (2006) and tailored to include the measures for the present study. Upon returning the completed baseline questionnaire by email, follow-up materials were then produced for each participant. Participants were invited by email to collect follow-up materials and return their consent sheet in person. Follow-up materials included a seven-day paper diary based on the day reconstruction method (DRM; Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004) and an RT3 tri-axial research activity monitor (StayHealthy Inc, California USA). Information sheets were also provided describing how to complete the measures and wear the activity monitor. Upon receipt of follow-up materials, a member of the research team showed participants how to complete the diaries and how to wear the activity monitor, ensured them of the confidentiality of their diary responses, and asked them to return the completed materials and accelerometer at the end of seven days. Upon returning the materials, participants were debriefed. The University of Aberdeen School of Psychology research ethics committee provided ethics approval for this study (reference PEC2002070871).

Baseline Measures

The study was framed using Personal Projects Analysis (PPA; Little, 1983) to conceptualize individuals' personal goals. At baseline, participants were presented with a definition of personal projects. Projects were defined as:

> All of us have a number of personal projects at any given time that we think about, plan for, carry out and sometimes (though not always) complete. Some projects may be things you choose to do or things you have to do; they may be things you are working towards or things you are trying to avoid. Personal Projects may be related to any aspect of your daily life: university, work, home, leisure and community, among others (Little, 2006, p. 1)

Participants were then provided with a list of examples of personal projects. The baseline questionnaire integrated standard measures of the proximal predictors of behavior in the TPB (intention and PBC) into the PPA procedure.

Intention and PBC. Participants were asked to complete measures of PA-related intention

??????†??????????????????/????????????????
and PBC based on those used by Armitage (2005) and Presseau et al. (2010), which were adapted to specify the timeline of the focal PA goal-directed behavior (i.e., in the next week). Intention was measured with three items (Cronbach's alpha = .78), e.g. "How often do you intend to participate in regular physical activity in the next week?" (*1–Never to 7– Frequently*). PBC was measured with four items (Cronbach's alpha = .91), e.g. "To what extent do you see yourself as being capable of participating in regular physical activity in the next week?" (*1 – Incapable to 7 – Capable*). While responding to TPB items, regular PA was defined to participants as any non-sedentary behavior.

Personal projects elicitation. Participants were asked to list up to 15 personal projects that they were currently actively engaged in that best characterized their everyday life. Participants' full list of projects was kept for subsequent rating irrespective of number, to maximize the personal relevance of their projects. Two personal projects were included in all participants' project lists and participants were instructed to list personal projects other than the two added projects; i.e., "Participate in regular physical activity" and "regularly study before/after class for my uni courses".

Cognitive assessment of goal facilitation and conflict. Perceptions of goal facilitation and conflict were measured as independent constructs (Riediger, 2007). When providing consent, participants were informed that they would be asked to rate how personal projects they list impact one another. Two separate project cross-impact matrices were used, adapted from Little [pic](Little, 1983, 2006; Little & Gee, 2007) and Presseau et al. (2010). The matrices were composed of participants' own elicited personal projects. Each matrix was prefaced with: "We are interested in understanding how each of your personal projects facilitate (conflict with) one another. Specifically, we would like to know to what extent working towards one project facilitates (conflicts with) working towards every other project. Note that participating in project A may highly facilitate (conflict with) participating in project B, but the reverse may not necessarily be true". Perceived goal conflict was assessed by asking participants to iteratively rate how each of their personal projects conflicts with participating in regular PA (*0–does not conflict at all to 10–conflicts to a great extent*). Perceived goal facilitation was similarly assessed by asking participants to rate how each of their personal projects facilitates participating in regular PA (*0–does not facilitate at all to 10–facilitates to a great extent*). Two sum scores were computed to represent the extent that the wider goal system was perceived to facilitate and conflict with participating in PA.

Presseau
J,
Tait
R,
Fr?? ? ? ?
????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Presseau
J,
Tait
R,
Fr??? ? ? ?
 ?????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Follow-up Measures

Follow-up measures consisted of a self-reported daily diary and accelerometer.

Diary. Participants were asked to complete a diary based on the DRM at the end of each day for seven consecutive days by thinking of the day “as a continuous series of scenes or episodes in a film”. Participants were asked to complete diaries by listing each episode in their day along with the estimated time at which the episode started and ended. Consistent with standard DRM, participants were then asked to indicate what sort of activities each episode involved (e.g., socializing, relaxing, eating) and whether the episode involved anyone else (e.g., friends, classmates, spouse) using pre-defined numbered categories for each. In a departure from the standard DRM, participants were also provided with the personal projects they listed at baseline and asked to indicate whether each episode involved any or several of their personal projects, using the number corresponding to each project from their personalized project lists to minimize participant burden. The DRM was preferred over experience sampling measures as it is less intrusive to everyday life and provides a detailed assessment of what individuals were engaged in all day on a day-to-day basis which could be used to indicate the amount of time spent in pursuit of all projects (Kahneman, et al., 2004). Data entry for all diaries was independently verified for accuracy by a member of the research team who compared the SPSS database for every participant against the original paper copies of daily diaries.

Behavioral assessment of goal conflict and goal facilitation. Previously used indicators of the pursuit of facilitating and conflicting goals in the literature were not directed to any particular goal-directed behavior but rather reflected the overall goal facilitation and goal conflict across all goal-directed behaviors (Riediger & Freund, 2004). The present study was specifically interested in goal conflict and goal facilitation in relation to engaging in PA. Thus, the behavioral indicators of goal conflict and goal facilitation were operationalized as the amount of daily time spent in pursuit of goals perceived to conflict with and facilitate engaging in regular PA. Each diary episode was screened for whether participants listed any of their personal goals as being pursued. Episodes involving a goal with a non-zero score on the cognitive assessment of goal facilitation and conflict were then identified. The duration of episodes involving a facilitating or conflicting goal was then summed for each day to compute daily behavioral indicators of goal conflict and facilitation. These indicators were used to test the main hypotheses and reflect the daily time engaged in pursuit of goals perceived to facilitate and conflict with PA. MVPA may also be related to the overall daily time spent in pursuit of any other personal goal, regardless of

one's beliefs about their facilitating or conflicting influence on MVPA. A secondary analysis was conducted to assess whether overall daily time pursuing personal goals was related to MPVA.

Objective physical activity. Participants were asked to wear an accelerometer at waist-level, which measured their movement on all three axes at one-minute intervals over seven consecutive days. The accelerometers did not provide feedback. After 7 days, raw accelerometer data was uploaded into *Microsoft Excel* and included minute-by-minute activity bouts. Raw accelerometer counts are sensitive to all movement and should be filtered to be used as objective outcome data for PA, a procedure known as data reduction (Mâsse et al., 2005). Table 1 presents a list of procedures employed to reduce the raw accelerometer counts, using recommended procedures and cut offs of moderate to vigorous physical activity (MVPA; Mâsse, et al., 2005; Rowlands, Thomas, Eston, & Topping, 2004). MVPA was selected as the level of PA of interest given its correspondence with guideline recommendations and previous accelerometer-based research (Maddison et al., 2009; Trost, Saunders, & Ward, 2002). As MVPA recorded by the accelerometer was likely a function of the amount of time the device was worn, each participant's daily wear time was extracted from their accelerometer outputs and controlled for in the main analyses.

< Table 1 >

Data Analysis

The data in this study involved repeated daily assessments (from diaries) and observations (from accelerometers) for each individual. Each individual also provided demographic, intention, PBC, and perceived goal facilitation and conflict data at baseline. The data were best described as hierarchically organized such that daily measures (Level 1) were nested within individuals (Level 2). Furthermore, the daily repeated measures data were interval-contingent such that they were not necessarily independent of one another. Multilevel linear modeling (MLM) is the most appropriate analytical procedure for testing such data structures (Nezlek, 2001). MLM allows for the variability within participants (Level 1) to be accounted for alongside the variability between participants (Level 2). MLM was therefore used to test the study hypotheses. Specifically, we investigated how variability between individuals and days in goal conflict and facilitation predicted their daily MVPA.

Data were first entered into SPSS to perform diagnostics and calculate basic statistics and partial correlations between theoretical predictors of MVPA. Multilevel models were then fitted

Presseau
J,
Tait
R,
Fr?? ? ? ?
 ?????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

using MLwiN 2.20 (Rasbash, Browne, Healy, Cameron, & Charlton, 2010). All variables were grand-mean centered prior to being entered into the analyses (Nezlek, 2001).

The study hypotheses involved testing whether each set of theoretical constructs added significantly to the prediction of MVPA. A series of models were fitted whereby each parameter (construct) was added to the model and a likelihood ratio test conducted to assess whether the added construct(s) at each step significantly increased model fit (Rasbash, Steele, Browne, & Prosser, 2004). Fitting each model in MLwiN produces a deviance statistic (-2 log likelihood). The likelihood ratio test tests the difference between two models by subtracting the deviance statistic of a model with an added parameter from the deviance statistic of a model without the added parameter. The result is tested against a chi-square distribution with degrees of freedom equivalent to the number of parameters added to the model (Rasbash et al., 2004). In addition, standardized regression coefficients were produced for fixed effects by standardizing all variables and re-running the models in order to produce a measure of effect size to compare variables against one another.

Results

Participants

123 participants were sent baseline materials during regular term time, 118 of which completed all measures (mean age = 23.4 years, *SD*=6.3; 89 [75.4%] women, 29 [24.6%] men). Five participants did not return baseline materials. The final sample included 106 participants (86.2%; 3 were excluded due to missing accelerometer data and 9 were deleted list wise due to missing data on predictor variables).

Descriptive Statistics

All participants provided at least 3 days of valid accelerometer data, with the majority (*n*=93; 87.7%) having worn the accelerometer for at least five hours for all 7 days. Across valid days, participants wore their accelerometer for a mean of 789.5 minutes ($SD_{pooled\ w/in}$ = 171.7 minutes). Participants engaged in a mean of 79 minutes of MVPA per day ($SD_{pooled\ w/in}$=65 minutes), amounting to 10% of the time wearing the RT3. Diary completion rates were high, with

??????†??????????????????/????????????????
a median of three participants not completing their diary on any given day.

Participants listed a mean of 6.19 projects (range= 0 to 15). Most participants (93%; *n*=99) reported at least one diary episode involving pursuing one of their personal projects besides participating in regular PA. Participants spent a mean of 334.8 minutes ($SD_{pooled\ w/in}$=260.6 minutes; range across days= 0 to 1035 minutes) pursuing projects that they perceived conflicted to some extent with participating in regular PA, and 277.3 minutes ($SD_{pooled\ w/in}$=256.6 minutes; range across days= 0 to 1000 minutes) in pursuit of projects perceived to facilitate participating in PA.

Descriptives and partial bivariate associations between theoretical constructs. Ratings of perceived goal conflict and goal facilitation were based on however many projects individuals elicited. Partial correlations, controlling for number of projects, were used to when assessing the relationship between the theoretical constructs to avoid biasing the sum scores used as indicators of perceived goal conflict and facilitation (Table 2). Perceived goal facilitation was strongly associated with daily pursuit of facilitating goals. Similarly, perceived goal conflict was strongly partially correlated with daily pursuit of conflicting goals. Only the pursuit of conflicting goals was significantly related to intention and PBC. The latter two were strongly correlated.

< Table 2 >

Multilevel Modeling Results

Intercepts-only model. An intercepts-only (variance components) model was first run to assess how much of the variability in MVPA was located between and within participants to determine whether a multilevel analysis was necessary. In the intercepts-only model, within-subject variance ($?^2_e$) was 3094.80 and between-subjects variance ($?^2_{u0}$) was 1072.04. Thus, 74.3% of the total variability in MVPA was within-participants, indicating that within-subject variability should be considered in these analyses. The deviance statistic of -2 log likelihood for the intercepts-only model was 7441.55.

Autocorrelation. Given the proximity in time between daily activity monitor measures of MVPA, it was likely that daily MVPA would be auto-correlated within individuals, i.e., MPVA across days would be correlated. An autoregressive parameter (?) was included in each subsequent model to control for auto-correlation, following procedures outlined by Rasbash and colleagues (2009). Adding the autoregressive parameter to the intercepts-only model significantly improved model fit (?-2 log likelihood=7.61, df=1 , *p*=.01).

Presseau
J,
Tait
R,
Fr??? ? ? ?
?????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Presseau
J,
Tait
R,
Fr?? ? ? ?
 ?????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Number of projects. Next, the number of projects listed by participants was added to the model to avoid biasing the association between MVPA and goal conflict and goal facilitation scores. The addition on the number of listed projects did not significantly improve the model fit (?-2 log likelihood=4.52, df=1, *p*=.07), but was itself a significant predictor of MVPA.

Testing partial associations with MVPA. The next analyses were conducted to assess partial associations between theoretical and demographic predictors and MVPA, controlling for autocorrelation and number of projects. Between-subjects correlations would not have been appropriate for testing relationships between predictors and MVPA given the substantial within-subject variability in MVPA. A series of variance components models were therefore fitted to test the relationship between each theoretical and demographic predictor and MVPA, controlling for autocorrelation and number of projects (Table 3). Age, gender, PBC, and daily accelerometer wear-time were all significantly associated with MVPA. However, intention, baseline perceived goal conflict and goal facilitation, and daily pursuit of conflicting and facilitating goals were not. Although perceived goal conflict's relationship was not in the expected (negative) direction, it was not statistically significantly associated with MVPA.

< Table 3 >

Model testing. On the basis of initial models investigating partial associations between MVPA and demographic and theoretical predictors, a series of nested models were iteratively fitted to test the hypotheses (Rasbash, et al., 2004; Tabachnick & Fidell, 2007). A significant decrease in the deviance statistic indicated by a change in the -2 log likelihood statistic and evaluated against a chi-square distribution was used to test successive models against one another. First, the intercept only model was fitted, followed by adding the autocorrelation parameter and number of projects in participants list of projects, as previously described. Next, intention and PBC, as well as age, gender and daily accelerometer wear-time were added to the model to control for their relationship with MVPA. Although intention was not significantly bivariately associated with MVPA, it was controlled for alongside PBC on theoretical grounds to test the main study hypotheses. The addition of these constructs significantly improved model fit (? -2 log likelihood = 171.30, df=5, *p*<.01). Age, gender, number of projects, PBC, and daily accelerometer wear-time were all significant predictors of MVPA.

Perceptions of Goal Facilitation and Goal Conflict as Predictors of MVPA (Level 2

effects). Perceived goal facilitation was then added to the model, and significantly improved the model fit (?-2 log likelihood=5.66, df=1, *p*=.03) and reduced between- and within-participant variation in MVPA. Baseline perceived goal conflict scores were then added but did not improve model fit (?-2 log likelihood= 0.77, df=1, *p*=.76). Thus, perceived goal facilitation, but not goal conflict, significantly predicted MVPA over and above intention and PBC (Table 4). Standardized regression coefficients for perceived goal facilitation were largely equivalent to PBC in the model. Goal facilitation was entered into the model first on the basis of previous research findings (Presseau, et al., 2010).

Daily pursuit of facilitating and conflicting goals as predictors of MVPA (Level 1 effects). Behavioral indicators of goal facilitation and goal conflict, i.e., the daily time in pursuit of projects that facilitate and conflict with regular PA, were then sequentially added to the model to test whether they significantly improved model fit over and above baseline goal facilitation. Pursuit of facilitating goals did not improve the model fit (?-2 log likelihood=<.01, df=1, *p*=.99). Pursuit of conflicting goals was then added to the model and significantly improved model fit (?-2 log likelihood= 9.35, df=1, *p*<.01), and was negatively associated with MVPA. Pursuit of conflicting goals accounted for significant within-participant variability in MVPA but increased the amount of between-participant variability. Adding the daily pursuit of conflicting goals to the model attenuated the association between perceived goal facilitation and MVPA to the point of no longer being a significant predictor (Table 4). An exploratory cross-level interaction was fitted but not reported as no relationships were observed. Daily pursuit of *any* personal goal irrespective of perceptions of conflict and facilitation did not predict MVPA on its own (*B*= -.004, *SE*=.012, *p*=.76, accounting for number of projects) or when controlling for age, gender, number of projects, intention, PBC, and RT3 wear time (*B*= -.01, *SE*=.01, *p*=.28).

< Table 4 >

Discussion

Main Findings

The present study demonstrated that cognitively assessed perceptions of goal facilitation predict MVPA assessed by accelerometers over 7 days, over and above intention and PBC, supporting Hypothesis 1. Behaviorally assessed pursuit of conflicting (but not facilitating) goals negatively predicted MVPA over intention and PBC, which attenuated the effect of perceived goal

GOAL CONFLICT AND FACILITATION PREDICTING EXERCISE 32

Presseau
J,
Tait
R,
Fr?? ? ? ?
 ?????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

facilitation on PA. Participants were thus engaged in less MVPA on days where they pursued personal goals which conflicted with their PA. Thus, Hypothesis 2 that behavioral indicators of goal conflict and goal facilitation would improve the prediction of MVPA over and above perceptions of goal facilitation and conflict was supported for goal conflict but not goal facilitation. The findings highlight the value of moving away from a single-behavior paradigm towards one that considers the wider context of multiple goal pursuit. The findings also have implications for behavior change, suggesting that targeting goal conflict at the intra-individual level may be a means of promoting PA.

Perceptions of Goal Facilitation and Goal Conflict

Neither perceived goal conflict nor perceived goal facilitation had significant partial correlations with MVPA. However, in the main models perceived goal facilitation was a significant predictor and significantly improved model fit when added to the model. Control variables likely clarified the relationship between perceived facilitation and MVPA (Tabachnick & Fidell, 2007). The finding that perceived goal facilitation predicts accelerometer-assessed PA over and above intention and PBC is consistent with previous research and demonstrates the robustness of this relationship beyond self-reported PA (Presseau et al., 2010). Also consistent with previous research was the finding that perceived goal conflict was not a significant predictor of PA [pic](Li & Chan, 2008; Presseau, et al., 2010; Riediger & Freund, 2004) and that perceptions of goal facilitation and goal conflict were associated with behavioral indicators of pursuing conflicting and facilitating goals (Riediger & Freund, 2004). It is plausible that people with high intentions engage in more MVPA when they have fewer conflicting and more facilitating goals. Past research has not identified significant interaction effects (Presseau et al., 2010), and thus the present study focused on testing for main effects. Future research should further investigate potential moderators.

Though the behavioral indicator of goal facilitation was hypothesized to improve model fit over perceived goal facilitation, rather, it was the behavioral indicator of goal *conflict* that improved the model. In so doing, the addition of the daily pursuit of conflicting goals attenuated the relationship between perceived goal facilitation and MVPA to the point of no longer being statistically significant. Although most previous research has shown goal conflict and goal facilitation to be largely orthogonal, the present study found evidence for their association, which may account for the observed attenuation effect. While multicollinearity between the behavioral

??????†????????????????????/????????????????
indicator of goal conflict and perceived goal facilitation scores may be suspected as an explanation for the attenuation, the modest bivariate relationship between the two variables suggests otherwise. Another explanation may be the presence of perceived goal conflict in the model, which, while not predictive of PA in the models, was associated with both perceived goal facilitation and the behavioral indicator of goal conflict. Nevertheless, the implication of the attenuated association between perceived goal facilitation and MVPA when adding the behavioral indicator of goal conflict is that day-to-day goal conflict within individuals may provide a better account of how goal systems impact PA.

The Daily Pursuit of Facilitating and Conflicting Projects

It appears that this is the first study to quantify the time that individuals spend in pursuit of personal goals that facilitate and conflict with one of their health-related behaviors. The results suggesting that individuals spend on average a third of their time in such pursuits is compelling. However, it is unclear whether this should be considered as a lot or not. On one hand, spending a third of one's time in projects that conflict with PA suggests that the majority of individuals' time was *not* in pursuit of conflicting projects. This interpretation suggests that time, as a resource, is not in short supply in this sample. However, while on average individuals spent a third of their time pursuing goals which conflicted with their PA, conflict on a given day varied around the mean and was shown to significantly negatively predict MVPA over and above intention and PBC. By implication, the more time spent in conflicting projects on a given day, the less MPVA they engage in on that day, irrespective of intention and PBC.

As the daily pursuit of conflicting goals accounted for significant intra-individual variation in MVPA, goal conflict in this context may be particularly relevant as a predictor of intra-individual variation in health-related behavior rather than the more commonly tested inter-individual perspective. This is supported by findings from other diary-based studies that have taken intra-individual perspectives to investigate the relationship of daily hassles and daily job demands with health-related behavior (O'Connor, et al., 2008; Payne, et al., 2010). The present study adds to this literature by demonstrating that daily variation in one's PA can be accounted for by time spent in personally listed and valued goals that conflict with PA, over and above one's intention and PBC to do PA over the course of the week. The findings also highlight the relevance

Presseau
J,
Tait
R,
Fr?? ? ? ?
 ????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Presseau
J,
Tait
R,
Fr?? ? ? ?
 ?????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

of testing theory within individuals (Scholz, Keller, & Perren, 2009).

While perceived goal facilitation explained significant between-participant variation in MVPA over and above intention and PBC, daily pursuit of facilitating goals was not a statistically significant predictor of within-participant variation in MVPA. The behavioral indicators of goal facilitation and conflict were both operationalized as involving spending time-related resources. It is possible that spending more time in facilitating projects nevertheless implies goal conflict, an idea supported by the strong association between behavioral indicators of both goal constructs. Other daily resources (energy or money) may be more relevant for the pursuit of facilitating goals than time-related resources and should be assessed in future research.

The number of projects listed by participants predicted their MVPA, even when controlling for age, gender, intention, PBC and daily RT3 wear-time. Indeed, the relationship was attenuated only when adding goal facilitation and conflict to the model. Generally pursuing more personal projects may therefore be beneficial to one's activity levels, further underscoring the relevance of investigating how the wider goal system may impact on health-related behavior.

Strengths, Limitations and Future Research

It appears that this study is among the first to test the proximal predictors of behavior in the TPB as predictors of objective accelerometer-based data in a healthy adult sample. It also heeds calls from the literature for testing novel constructs against existing theoretical constructs rather than in isolation (Noar & Zimmerman, 2005). Accelerometers unconditionally captured all PA engaged in every minute, from minor movements to a sprint. The minute-by-minute data can then be filtered to reflect PA of at least moderate intensity, but overall accuracy depends on participants consistently wearing them. As a result, the specificity of MVPA assessment and variability in wearing the device may lead to an underestimate of the 'true' relationships between PA scores and the explanatory variables. The measure of behavior in the present study included all time spent in MVPA. While a more stringent level of MVPA could have been used (e.g., MVPA with a duration of at least 10 minutes), a non-conditional level of MVPA provided the best balance of correspondence with the level of specification of TPB and PPA-based study variables and an accurate account of daily MVPA. The 2010 Scottish Health Survey showed that 51% of 16-34 year olds reported meeting recommendations of at least 30 minutes of MVPA on at least 5 days a week, with a further 30% of 16-24 year olds reporting at least 30 minutes of MVPA on 1 to 4 days per week (Corbett et al., 2010). High mean and considerable within-subject variability in

??????†??????????????????/????????????????

MVPA levels in the present study suggested that the sample was active to a degree that is largely consistent with national survey data. The higher levels of observed MPVA may be a feature of the objective measure used, based on any bout of MVPA lasting at least a minute, which provided a more sensitive and accurate assessment of MVPA than self-reports. Indeed, the levels of MVPA observed in the present study are remarkably consistent with other theory-based studies using accelerometers to assess PA in samples of young people. For example, Maddison et al., (2009) observed that a teenage sample engaged in a mean of 84 minutes of accelerometer-assessed MVPA. The physical activity levels found in this study are broadly in line with PA levels found for samples of similar age and gender composition, and variability might be due to details of the methodology used to measure PA.

Future research should test whether the findings generalize to less active samples. Nevertheless, given that less active individuals have more conflicting goals and focus upon them more than their PA, the generalizability of the findings seems reasonable [pic](Gebhardt & Maes, 1998; Jung & Brawley, 2010; Karoly, et al., 2005). While based on a student sample, the observed relationship between gender and MVPA is consistent with national health survey results which show that men report engaging in more PA than women, as is the finding that age is negatively associated with PA (Corbett, et al., 2010).

Time was not necessarily a constraining resource in this sample. Nevertheless, daily time spent in pursuit of conflicting goals negatively predicted MVPA. Future research should assess whether goal facilitation and conflict predict behavior in more resource constrained contexts, such as clinical consultations (Presseau, Sniehotta, Francis, & Campbell, 2009). In addition, behavioral indicators of goal conflict and goal facilitation were composed of time spent in pursuit of projects with a non-zero rating for perceived goal conflict and perceived goal facilitation. The non-zero cut-off was selected as the most defensible method of identifying personal goals that could in any way be viewed as conflicting and facilitating. Future studies could nevertheless consider using other cut-off points for identifying conflicting and facilitating personal goals.

Participants were likely aware of some of their daily MVPA despite the lack of feedback from the accelerometer, which may have affected how they completed their diaries. Perceived levels of daily MVPA may have influenced which conflicting and facilitating projects were identified each day. However, participants were asked to list which projects (if any) were involve in each of their daily episodes without any reference to conflict or facilitation, and were not made aware of the study hypotheses until completion of the study, which protected against how

Presseau
J,
Tait
R,
Fr??? ? ? ?
????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Presseau
J,
Tait
R,
Fr?? ? ? ?
 ?????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

perceived MVPA may have influenced project identification.

The within-participant research questions were formulated to investigate daily variability in MVPA as a function of daily variability in time pursuing conflicting and facilitating goals. Future research could consider a further level of within-participant variability, e.g., within days.

DRM-based daily diaries may be more time consuming to complete than experience sampling methods. Diary completion rates were generally high, though it is possible the time required to complete them led to some under-reporting. While the DRM-based procedure allowed us to quantify daily time spent in pursuit of conflicting and facilitating goals, future research could employ alternative experience sampling approaches.

Conclusion

Perceptions of goal facilitation can predict objectively measured PA over and above intention and PBC, but ultimately the time spent pursuing conflicting goals provides a better account for the relationship between of the wider system of multiple goal pursuit and PA.

??????†??????????????????/????????????????

References

Abraham, C., & Sheeran, P. (2003). Implications of goal theories for the theories of reasoned action and planned behaviour. *Current Psychology: Developmental, Learning, Personality, Social, 22*, 264-280.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Armitage, C. J. (2005). Can the Theory of Planned Behavior Predict the Maintenance of Physical Activity? *Health Psychology, 24*, 235-245.

Cantor, N., Norem, J., Langston, C., Zirkel, S., Fleeson, W., & Cook-Flannagan, C. (1991). Life tasks and daily life experience. *Journal of Personality, 59*, 425-451.

Conner, M., Fitter, M., & Fletcher, W. (1999). Stress and snacking: a diary study of daily hassles and between-meal snacking. *Psychology & Health, 14*, 51-63.

Corbett, J., Dobbie, F., Doig, M., D'Souza, J., Given, L., Gray, L., . . . Bromley, C. (2010). *Scottish Health Survey*. Edinburgh: Scottish Government.

Emmons, R. A. (1986). Personal strivings: An approach to personality and subjective well-being. *Journal of Personality and Social Psychology, 51*, 1058-1068.

Gebhardt, W. A., & Maes, S. (1998). Competing personal goals and exercise behaviour. *Perceptual and Motor Skills, 86*, 755-759.

Jung, M. E., & Brawley, L. R. (2010). Concurrent management of exercise with other valued life goals: Comparison of frequent and less frequent exercisers. *Psychology of Sport and Exercise, 11*, 372-377. doi: 10.1016/j.psychsport.2010.04.00

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterising daily life experience: The Day Reconstruction Method. *Science, 306*, 1776-1780.

Karoly, P., Ruehlman, L. S., Okun, M. A., Lutz, R. S., Newton, C., & Fairholme, C. (2005). Perceived self-regulation of exercise goals and interfering goals among regular and irregular exercisers: A life space analysis. *Psychology of Sport and Exercise, 6*, 427-442.

Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., Sleeth-Keppler, D., & Zanna, M. P. (2002). A theory of goal systems *Advances in Experimental Social Psychology* (Vol. 34, pp. 331-378). San Diego: Academic Press.

Li, K.-K., & Chan, D. K. S. (2008). Goal conflict and the moderating effects of intention stability

Presseau
J,
Tait
R,
Fr?? ? ? ?
 ?????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

in intention–behavior relations: Physical activity among Hong Kong Chinese. *Journal of Sport & Exercise Psychology, 30*, 39-55.

Little, B. R. (1983). Personal projects: A rationale and method for investigation. *Environment and Behavior, 15*, 273-309.

Little, B. R. (2006). Interactive PPA workbook Microsoft Excel File Retrieved 15 January, 2007, from http://www.brianrlittle.com/ppa/index.htm

Little, B. R., & Gee, T. L. (2007). The methodology of personal projects analysis: Four modules and a funnel. In B. R. Little, K. Salmela-Aro & S. D. Phillips (Eds.), *Personal Project Pursuit: Goals, Action, and Human Flourishing* (pp. 51-93). London: Lawrence Erlbaum.

Maddison, R., Vander Hoorn, S., Jiang, Y., Mhurchu, C. N., Exeter, D., Dorey, E., . . . Turley, M. (2009). The environment and physical activity: The influence of psychosocial, perceived and built environmental factors. *International Journal of Behavioral Nutrition and Physical Activity, 6*, 19. doi: 10.1186/1479-5868-6-19

Mâsse, L. C., Fuemmeler, B. F., Anderson, C. B., Matthews, C. E., Trost, S. G., Catellier, D. J., & Treuth, M. (2005). Accelerometer data reduction: A comparison of four reduction algorithms on select outcome variables. *Medicine & Science in Sports & Exercise, 37 (Suppl.)*, S544-S554.

McEachan, R. R. C., Conner, M., Taylor, N., & Lawton, R. J. (2011). Prospective prediction of health-related behaviors with the Theory of Planned Behavior: A meta-analysis. *Health Psychology Review, 5*, 97-144. doi: 10.1080/17437199.2010.521684

National Institute for Health and Clinical Excellence. (2006). *Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling*. London: National Institute for Health and Clinical Excellence.

Nezlek, J. B. (2001). Multilevel random coefficient analyses of event- and interval-contingent data in social and personality psychology research. *Personality and Social Psychology Bulletin, 27*, 771-785.

Noar, S. M., & Zimmerman, R. S. (2005). Health Behavior Theory and cumulative knowledge regarding health behaviors: Are we moving in the right direction? *Health Education Research, 20*, 275-290.

O'Connor, D. B., Jones, F., Conner, M., McMillan, B., & Ferguson, E. (2008). Effects of daily hassles and eating style on eating behavior. *Health Psychology, 27 (Supplement)*, S20-S31.

??????†??????????????????/????????????????

Payne, N., Jones, F., & Harris, P. R. (2010). A daily diary investigation of the impact of work stress on exercise intention realisation: Can planning overcome the disruptive influence of work? *Psychology & Health, 25,* 111-129. doi: 10.1080/08870440903337622

Presseau, J., Sniehotta, F. F., Francis, J. J., & Campbell, N. C. (2009). Multiple goals and time constraints: perceived impact on physicians' performance of evidence-based behaviours. *Implementation Science, 4*, 77. doi: 10.1186/1748-5908-4-77

Presseau, J., Sniehotta, F. F., Francis, J. J., & Gebhardt, W. A. (2010). With a little help from my goals: Integrating intergoal facilitation with the theory of planned behaviour to predict physical activity. *British Journal of Health Psychology, 15*, 905-919. doi: 10.1348/135910710X494105

Rasbash, J., Browne, W. J., Healy, M., Cameron, B., & Charlton, C. (2010). MLwiN (Vol. 2.20). Bristol, UK.

Rasbash, J., Steele, F., Browne, W., & Prosser, B. (2004). *A user's guide to MLwiN*. Bristol, UK: Centre for Multilevel Modelling, University of Bristol.

Rhodes, R. E., & Blanchard, C. M. (2008). Do sedentary motives adversely affect physical activity? Adding cross-behavioural cognitions to the theory of planned behaviour. *Psychology & Health, 23,* 789-805. doi: 10.1080/08870440701421578

Riediger, M. (2007). Interference and facilitation among personal goals: age differences and associations with well-being and behavior *Personal Project Pursuit: Goals, Action, and Human Flourishing* (pp. 119-143). London: Lawrence Erlbaum.

Riediger, M., & Freund, A. M. (2004). Interference and facilitation among personal goals: Differential associations with subjective well-being and persistent goal pursuit. *Personality and Social Psychology Bulletin, 30,* 1511-1523. doi: 10.1177/0146167204271184

Rowlands, A. V., Thomas, P. W. M., Eston, R. G., & Topping, R. (2004). Validation of the RT3 Triaxial Accelerometer for the assessment of physical activity. *Medicine & Science in Sports & Exercise, 36,* 518-524.

Scholz, U., Keller, R., & Perren, S. (2009). Predicting behavioral intentions and physical exercise: A test of the health action process approach at the intrapersonal level. *Health Psychology, 28*, 702-708. doi: 10.1037/a0016088

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. London: Allyn and Bacon.

Trost, S. G., Saunders, R., & Ward, D. E. (2002). Determinants of physical activity in middle

Presseau
J,
Tait
R,
Fr??? ? ? ?
??????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Presseau
J,
Tait
R,
Fr?? ? ? ?
 ?????????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal
conflict and goal facilitation as predictors of accelerometer-assessed
physical activity. Health Psychology 2012. E-pub ahead of print.
http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

school children. *American Journal of Health Behavior, 26*, 95-102.
Wilensky, R. (1983). *Planning and understanding: A computational approach to human reasoning*. London: Addison-Wesley.

??????†??????????????????/????????????????

Table 1

RT3 Accelerometer Data Reduction

Data cleaning procedures applied to raw data	Details
Identify a minimum wear-time for a valid day	A minimum wear time of 5 hours was identified from RT3 activity counts
Identify start of day	Start of day identified as first 5 consecutive bouts of activity after 4.30am with activity count > 100
Identify end of day	End of day identified as last 5 consecutive bouts of activity before 4.30am with activity count > 100
Control RT3 activity counts for varying wear times per day	Daily RT3 activity counts were controlled for RT3-identified waking hours in main analyses
Adjust RT3-identified waking hours for non-wear time	RT3 identified waking hours were adjusted for participant-identified removal of RT3s in daily diaries
Identify at least moderate physical activity	Apply cut-off score of greater than 984 counts per minute (Rowlands et al., 2004)

Presseau
J,
Tait
R,
Fr??? ? ? ?
????????????????????????????????ancis JJ, Johnston D, Sniehotta FF. Goal conflict and goal facilitation as predictors of accelerometer-assessed physical activity. Health Psychology 2012. E-pub ahead of print. http://www.ncbi.nlm.nih.gov/pubmed/22888818 1

Presseau
J,
Tait
R,
Fr???????????????

??????†??????????????????/???????????????

|Table 3 |
|Descriptive Statistics, and Between- (n=106) and Within- (n=673) |
|Participant Partial Associations between Predictors and Daily MVPA |

Level	Variable	?	B	SE	p
Level 2 effects	Age	-.12	-1.13	.55	.04
	Gendera	-.51	-33.00	7.85	<.01
	Intention	.09	4.52	2.90	.12
	Perceived behavioral control	.17	8.15	2.76	<.01
	Perceived goal facilitation	.13	.40	.22	.07
	Perceived goal conflict	.12	.44	.23	.06
Level 1 effects	Daily time wearing accelerometer	.40	.14	0.01	<.01
	Daily pursuit of facilitating goals	.06	.02	0.01	.16
	Daily pursuit of conflicting goals	-.05	-.01	0.01	.28

|Note. Each added predictor of MVPA is tested individually as a nested |
|model of the initial intercepts only model, controlling for |
|autocorrelation and number of projects |
|B=unstandardized coefficients; ?=standardized coefficients; |
|SE=standard error |
|a reference category was men |

Presseau J, Tait R, Fr???????????????????

Presseau
J,
Tait
R,
Fr???????????????