



Which characteristics of planning matter? Individual and dyadic physical activity plans and their effects on plan enactment[☆]



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ABSTRACT

Objective: Past research supports individual planning as an effective intervention strategy to increase physical activity in individuals. A similar strategy, dyadic planning, adds a planning partner who supports an individual's planning processes. Whether the two planning formats differ in terms of participants' entered plan content and whether and how different content characteristics are linked to plan enactment remains unknown. By investigating the content of generated plans, this study aimed at distinguishing plan characteristics of the two planning formats and examining their role as predictors of later plan enactment.

Methods: Secondary analyses of a three-arm RCT with German couples (data collection between 2013 and 2015). Couples were assigned to an individual (IPC, $n = 114$) or dyadic planning condition (DPC, $n = 111$) and formulated up to 5 physical activity plans for a target person. Couples assigned to a control condition were not included as they did not generate plans. The following characteristics were distinguished and coded for each plan: number of planned opportunities, presence of a planned routine, planned cue- or activity-related specificity, activity-related intensity, and chronological plan rank. One week before (T0) and two weeks following (T2) the intervention (T1), increase vs. no increase of the planned activity was coded as a dichotomous plan enactment variable. Multilevel logistic regressions were fit.

Results: Plan enactment was higher in dyadic than in individual planners. Findings indicated that routines (e.g., after work) were positively related to plan enactment, whereas a high specificity of when-cues (e.g., Friday at 6.30 p.m.) showed a negative relationship. None of the examined plan characteristics could explain differences in enactment between IPC and DPC.

Conclusions: Linking health behaviours to other behavioural routines seems beneficial for subsequent plan enactment. Dyadic planning was linked with higher enactment rates than individual planning. However, as mechanisms underlying this effect remain unclear, they should be investigated further.

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1. Introduction

Regular physical activity has been shown to reduce the risk for various chronic diseases (Haskell et al., 2007). However, many motivated individuals fail to translate their intentions into action (e.g., Godin and Conner, 2008). To address this “intention-behaviour-gap” (Inauen et al., 2016; Sheeran and Orbell, 1999), health behaviour models (e.g., Health Action Process Approach; HAPA; Schwarzer, 2008) include action planning as a predictor of behaviour change. Compared with health behaviours such as dental

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flossing, increasing physical activity is a far more complex endeavour. For instance, individuals can form plans on a variety of different forms of activities (e.g., transport-, household- or sports-related activities). A recent meta-analysis showed substantial positive links between planning and physical activity (Carraro and Gaudreau, 2013), however, more insights into complex mechanisms of planning-physical activity links are needed.

Gollwitzer (1999) conceptualized if-then planning (i.e., implementation intentions) as a mental simulation of anticipated contextual cues (when- or where-cues; if/when-part) which are linked to a planned behavioural response (what/how; then-part). For instance, the plan “When I am at home and finished with breakfast, then I will go running for 30 min” entails a where-cue (“I am at home”), a when-cue (“finished breakfast”), the planned behaviour (“running”), and details on how the behaviour will be executed (“for 30 min”). An extended form of planning individually one’s own behaviour is dyadic planning, which refers to planning one’s own behaviour together with a partner (Burkert et al., 2011). Because here a planning partner is involved — with additional ideas, thoughts, and insights into the target person’s daily life — the content of dyadic plans could vary from individual plans. Similarly, the extent to which individuals successfully enact their plans might depend on the planning format. The goal of this study was to contrast the content of individual and dyadic plans as well as their subsequent enactment. This was done by coding characteristics of plans written down by target persons assigned to two intervention conditions, namely an individual planning or a dyadic planning condition. Coded plan characteristics were then linked to a plan enactment indicator.

1.1. Planning in the dyad

Hagger and Luszczynska (2014) divided formats of action planning into planning by oneself (here referred to as individual planning) and planning with others. The latter can take two different forms: collaborative implementation intentions (e.g., Prestwich et al., 2005) and dyadic planning (e.g., Burkert et al., 2011). Whereas a collaborative implementation intention addresses joint behavioural responses of both persons, a dyadic plan addresses the planned behavioural response for only one person (henceforth described as target person) and has thus much in common with an individual plan. When planning dyadically, the assisting person (henceforth described as planning partner) is assumed to provide plan-related ideas, to critically ask questions, or to support and encourage the target person in forming a feasible plan. As in previous research (Benyamini et al., 2011; Burkert et al., 2012; Burkert et al., 2011), the present study examines dyadic planning in adult couples because they share much time of their daily routines and often co-regulate their partners’ behaviours (Martire et al., 2010). Furthermore, this study aims to investigate content differences in dyadic and individual plans (Hagger et al., 2016) as well as how the content of dyadic and individual plans is associated with plan enactment.

1.2. Plan enactment as a proximal behavioural outcome

Physical activity studies testing the effectiveness of planning interventions most commonly used outcome measures which aggregate effects of planned and non-planned moderate-to-vigorous physical activity (MVPA; e.g., Luszczynska et al., 2016). However, a distinction between aggregated and planned behavioural outcomes might be crucial when examining planning effects (Sniehotta, 2009). For instance, a person could generate a plan including the behavioural response “then I will go swimming”. To evaluate the success of the formulated plan, one could either ask

the target person to give an estimate of her or his MVPA (aggregated) or ask specifically about his/her swimming (planned behaviour). *Plan enactment* (de Vries et al., 2013) captures the latter idea and refers to the extent to which individuals enact their plans. In two studies, plan enactment was positively related to smoking cessation (de Vries et al., 2013) and smoking-related care of general practitioners (Verbiest et al., 2014).

1.3. Conceptualizing plan characteristics and their relations to behavioural outcomes

As characteristics of self-generated plans might vary across individuals, research attempted to elicit key characteristics of plans e.g., their specificity (de Vet, Gebhardt et al., 2011; de Vet, Oenema and Brug, 2011; Dombrowski et al., 2016; Fleig et al., in press; Osch et al., 2009; Reinwand et al., 2016; Verbiest et al., 2014; Ziegelmann et al., 2006). Based on the conceptual model of key characteristics of planning (Fleig et al., in press), the present study focused on plan characteristics related to (a) contextual cues (“if/when”-part of a plan), (b) the planned behavioural response (“then”-part of a plan), and (c) the overall plan.

1.3.1. Contextual cues: opportunities, routines, specificity

Research underscores the importance of persons actually encountering and detecting pre-formulated, contextual cues as a precondition for the execution of the planned behavioural response (Sniehotta, 2009). One possibility to increase the likelihood to encounter cues is to plan a higher frequency of *opportunities*, such as, “on weekdays” as compared to “on Saturdays”. Given a cue encounter is possible on five days a week (as compared to only one day), the likelihood to perform the planned behaviour should be increased.

A further characteristic of contextual cues relates to the presence of a *routine*, defined as a regularly occurring action sequence (Judah et al., 2013). Pre-existing routines are associated with physical activity automaticity (Fleig et al., 2016; Pimm et al., 2016). Furthermore, Judah et al. (2013) showed that individuals instructed to floss after teeth brushing (i.e., pre-existing routine) reported higher flossing levels compared to individuals instructed to floss before teeth brushing. As routines happen regularly and should be detected easily, including routines into plans should facilitate encountering contextual cues.

Specificity of cues is one of the most frequently investigated plan characteristics, but only few studies linked specificity to a health (behaviour) outcome. Moreover, some studies coded plan specificity based on text field entries for the overall plan (e.g., de Vet, Oenema et al., 2011; Dombrowski et al., 2016). For instance, in the study by de Vet, Oenema et al. (2011), one score point was coded for respective plan-related information in the following text fields: type of activity, day of the week, moment of the day, location of the activity, and duration of the activity. The sum of all points was then used to compute the specificity of the overall plan (i.e. assembling information on contextual cues and the behavioural response). However, plan specificity can also be investigated specifically for contextual cues and by distinguishing different forms of contextual cues (i.e., when, where). This was done in the study by Fleig et al. (in press) who found positive plan enactment relationships for the when-cue, but not for the where-cue. These findings partly support Gollwitzer’s assumptions (1999) that high precision of a situational cue should facilitate cue detection when individuals encounter planned situations. Nonetheless, these findings need further replication.

1.3.2. Behavioural response: specificity and activity intensity

Regarding the *specificity* of the behavioural response, empirical

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