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Title

Do people's goals for mass participation sporting events matter? A self-determination theory perspective.

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ABSTRACT

Background

Non-elite mass participation sports events (MPSEs) may hold potential as a physical activity promotion tool. Research into why people participate in these events and what goals they are pursuing is lacking. Grounded in Self-determination Theory (SDT), this study examined the associations between MPSE participants' goals, event experiences and physical activity.

Methods

A prospective cohort study was conducted; pre-event, participants reported their goals for the event. Four weeks post-event, participants reported their motivation for exercise, perceptions of their event achievement and moderate-to-vigorous intensity physical activity (MVPA). Bivariate correlations and path analysis were performed on data from 114 adults.

Results

Intrinsic goals (e.g., health, skill, social affiliation) for the event were positively associated with perceptions of event achievement whereas extrinsic goals (e.g., appearance or social recognition) were not. Event achievement was positively associated with post-event autonomous motivation which in turn was positively associated with MVPA.

Conclusions

Pursuing intrinsic but not extrinsic goals for mass participation sporting events is associated with greater perceptions of event achievement, which in turn is associated with post-event autonomous motivation and MVPA.

Introduction

Physical activity during adulthood is associated with better physical and psychological health[1] yet many adults in the United Kingdom are insufficiently active.[2] Effective physical activity interventions are therefore needed. Mass participation sports events (MPSEs) are a proposed way to promote physical activity.[3] Non-elite MPSEs are events in which "the primary focus is on promoting participation and engagement rather than the significance of the sporting outcome".[4]

There is limited evidence that MPSEs have broad appeal to people who are newly or infrequently active.[5] While over half of respondents who registered for their first *parkrun* (a weekly, timed community-based running event) were non-runners (25.3%) or occasional runner/joggers (26.0%)[6] other evidence suggests MPSEs may not attract the least active. [5,7-9] Some population sub-groups with typically low levels of physical activity[10] were well-represented in the study of *parkrun* including women, overweight individuals and older adults.[6] However, representation from ethnic minorities and lower socio-economic groups was disproportionately low.[6] Similarly, a pre-event survey of participants in an annual cycling MPSE in Australia found that women were under-represented (28%) and 85.29% of all respondents were already sufficiently active.[7]

The impact of MPSE participation on physical activity maintenance remains unclear. Previous research has shown that physical activity increases as people train for an event[11] however; around one third of study participants in the 2007 Dublin Mini Marathon (a 10k women-only event) reported a substantial decrease in their physical activity three months post-event. [12] Thus, while MPSEs may prompt short-term physical activity, motivation may not be sufficient to sustain it. Participation in charity MPSEs is becoming increasingly popular[13] and charity goals may represent a standalone or additional driver for entering events. As such, understanding the motivation of MPSE participants is important.

Accessibility and inclusivity of events (freedom) and the opportunity to help oneself and give something to others (reciprocity) were important for both initial motivation and continued participation in *parkrun.*[14] Further, health and fitness reasons were drivers of initial attendance with goal attainment (e.g., performance or attendance), social benefits and giving back to the community also important contributors to sustained involvement. Similarly, in a women-only triathlon series in New Zealand, participation was strongly driven by challenge and competition, followed by enjoyment, health, and stress management.[5] Beyond these descriptive findings, little is known about whether MPSE participants' pre-event goals could influence their experiences of an event, the quality of their post-event motivation and/or their physical activity .

One framework that has been used to understand the quality of MPSE participants' motivation[11] is self-determination theory (SDT).[15] In SDT, motivation is conceptualised from the perspective of both people's behavioural regulation (i.e., the reasons "why") and the content of their goals (i.e., the "what").[15] Regarding behavioural regulation, motivation is arranged along a continuum from controlled forms (e.g. to seek rewards, avoid punishment or feelings of guilt) to more autonomous forms (e.g. being driven by valued benefits, actions which align with one's broader sense of self or for fun and inherent satisfaction). Autonomous forms of motivation are associated with positive cognitive, affective and behavioural outcomes in physical activity whereas in general, controlled motivation either undermines or is not associated with these outcomes.[16-18] Within Goal Content Theory, a mini-theory within SDT[19] people's exercise goals are characterised as either intrinsic (i.e., goals for health, skill or social affiliation) or extrinsic (e.g., appearance or social recognition goals). Pursuit of intrinsic, relative to extrinsic, exercise goals has been associated with more autonomous forms of motivation, indicators of well-being, greater physical self-worth, lower exercise anxiety, and exercise/physical activity.[17,20-21]

Previous work suggests that MPSE participation is driven by different motivation regulations (e.g., some will be motivated by enjoyment, and others because they feel obliged having

signed up) and varied goals for the MPSE (e.g., some related to health or improving performance and others to improve their appearance).[6,11] According to SDT and previous research,[15, 21] these different regulations and goals will associate differently with behavioural and psychosocial variables related to MPSE participation. Funk and colleagues (2011)[11] found that enjoyment-based motives were positively associated with running commitment and that strength and endurance, stress management, challenge and health pressure motives were weakly but positively associated with future intention to exercise amongst road race participants.

A limitation of previous studies that have applied SDT to MPSE motivation is that they have failed to adequately measure or distinguish the distinct constructs of behavioural regulation (i.e., autonomous vs. controlled motivation) and goal content (i.e., intrinsic vs. extrinsic goals). Recent developments in goal content theory[19] and measurement in the exercise context[22] allow for SDT to be more rigorously applied to understand motivational *quality* of MPSE participants.

In this study we examine the associations between MPSE participants' event goals and their perceptions of event achievement and whether event achievement was associated with post-event motivational quality and in turn, post-event physical activity.

Methods

A prospective design was used in which participants of The Great Midlands Fun Run (GMFR), a UK-based 8.5 mile mass participation running event, completed an online survey pre-event and four weeks post-event. The study received ethical approval by a University of Bristol Ethics Committee.

Recruitment

All 2014 GMFR entrants aged 18 years or over were eligible and received an email upon registration which included a hyperlink to the pre-event online survey. Entrants were subsequently emailed two newsletters containing the study link. A link to a post-event

online survey was emailed to participants four weeks after the event with a reminder sent five days later. Participants were informed that participation was voluntary and that completing/submitting a questionnaire was taken as implied consent.

Measures

Pre-event measures

Demographics

Participants reported their age and gender, ethnicity and education.

Goal content

An adapted version of the Goal Content for Exercise Questionnaire (GCEQ)[22] was used to measure participants' goals for the GMFR event. The GCEQ comprises 20-items assessing intrinsic (i.e., health, social affiliation, skills) and extrinsic (i.e., social recognition, appearance) goals for exercise. Participants were asked to: "*indicate the extent to which these goals are important to you when deciding to enter the Great Midlands Fun Run*" using a 7-point likert scale: 1 (*not at all important*) to 7 (*extremely important*). As charity-based goals are common in MPSE events[13] four additional items, based on the charity subscale of the Aspiration Index,[23] were included to form a charity-based intrinsic goal factor: (1) *To raise money for charity*; (2) *To give something back to my community*; (3) *To raise awareness of a particular charity* (4) *To help others in need*. Exploratory factor analysis with oblimin rotation amongst the pre-survey sample (N = 395) showed that the 24 items loaded (all >.35) as expected on factors for health (mean factor loading = 0.70, SD = 0.14; α = 0.89), social affiliation (mean factor loading = 0.73, SD = 0.12; α = .81), skill (mean factor loading = 0.58, SD = 0.23; α = .87), charity (mean factor loading = 0.85, SD = 0.11; α = .92), social recognition (mean factor loading = 0.69, SD = 0.14; α = .90), appearance (mean factor loading = 0.70, SD = 0.12; α = .92). Composite intrinsic (α = .88) and extrinsic (α = .85) goal variables were calculated by averaging the items within the intrinsic subscales (health, social affiliation, skill & charity) and the extrinsic subscales (social recognition and appearance).

Post-event measures

Event achievement

Event achievement was measured with four items developed for this study scored on a 7-point likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*): (1) *I feel that I achieved my goal(s)*; (2) *After finishing the event I felt happy*; (3) *I am satisfied that I achieved my goal(s)*; (4) *I enjoyed the event.* An event achievement variable was derived by summing the items scores (α = .90).

Behavioural regulation

Post-event intrinsic motivation and identified, introjected and extrinsic regulation for exercise were measured using 16 items from the Behavioural Regulation in Exercise Questionnaire (BREQ-2)[24]. Items were scored on a 5-point likert scale from 0 (*not true for me*) to 4 (*very true for me*) and items within each subscale were averaged. The internal consistency of the subscales were: intrinsic motivation (α =.88); identified regulation (α = .81); introjected regulation (α = .72); external motivation (α = .78).

Physical activity

Participants self-reported their post-event physical activity using the International Physical Activity Questionnaire-Short Form (IPAQ-short).[25] Participants were asked separate questions about their walking, moderate-intensity activities and vigorous-intensity activities 'over the last 7 days'. Participants reported the number of days they engaged in these activities for bouts of at least 10 minutes (frequency) and, if applicable, they were then asked how many minutes they would usually engage in the activity on *one* of those days (duration). Metabolic Equivalent of Task (MET) minutes per week were calculated by multiplying three items: (1) activity frequency ; (2) activity duration and, (3) The MET value of the activity (3.3 for walking, 4.0 for moderate-intensity activity and 8.0 for vigorous-intensity activity).[26] MVPA was derived by summing the individual activity MET-minutes per week totals. In line with data handling guidelines[26] data exceeding 180 minutes were truncated to 180 MET minutes per week.

Data analysis

Participants who provided complete data at both time points were included in the analysis (N = 119). Preliminary analysis was undertaken to visually assess normality of the variables and to detect univariate and multivariate outliers.[27] All variables except intrinsic goals were skewed. After the removal of five multivariate outliers and transformations to MVPA (Square root) and event achievement (reflect & log) variables, all variables approximated normal. Results pertaining to associations with the event achievement variable were re-reflected prior to reporting so interpretation of the associations was commensurate with the original scale.

Bivariate correlations were explored between the variables. Due to the sample size, path analysis using the *sem* function in Stata (Version 12.1) was used to examine the hypothesised model (Figure 1). Observed variables for intrinsic and extrinsic goals, perception of event achievement, autonomous and controlled motivation and MVPA were specified. Intrinsic and extrinsic goals, and the errors between autonomous and controlled motivation were allowed to co-vary these variables are conceptually[15] and empirically related.[17] Associations were adjusted for participant age and gender. In line with previous work[28] and recommendations,[29] model fit was examined using chi-square (χ^2), the comparative fit index (CFI), root mean square error of approximation (RMSEA) and the standardised root mean residual (SRMR). For the CFI, values of 0.90 and 0.95 indicate good and excellent fit respectively and good fit was determined based on an RMSEA of 0.06 and SRMR of 0.08.

Results

Participants

Pre- and post-event surveys were completed by 119 participants. Factor analysis of the GCEQ was performed using the pre-event sample (N=395) and correlations and path analysis were performed on 114 participants (after the removal of 5 outliers). This sample of n=114 with complete data comprised 55.3% females (mean age = 41.11 years, SD = 12.24)

and 44.7% males (mean age = 44.14 years, SD = 12.16). Furthermore, 93.9% were White and 59.6% were University educated. Participants who were included in the analysis were not different to those excluded on age, gender, ethnicity or education, intrinsic or extrinsic goal endorsement (results available from the authors on request).

Motivation levels

Participants on average endorsed intrinsic goals slightly more strongly than extrinsic goals and reported high autonomous motivation and low controlled motivation (Table I). Similar to previous work,[22] intrinsic and extrinsic goals were positively correlated.

Path analysis

The initial path model did not fit the data well [χ^2 (14) = 30.07, p =.007, CFI = .79, RMSEA = .10 (95% CI = .05 to .15), SRMR = .07]. Modification indices suggested the addition of a path between extrinsic goals and controlled motivation. This path was added as it is consistent with SDT and evidence that extrinsic exercise goals are conceptually distinct from but positively correlated with controlled motivation.[21] The revised model (Figure 1) showed excellent fit to the data [χ^2 (13) = 14.46, p =.34, CFI = .98, RMSEA = .03 (95% CI = .00 to .10), SRMR = .05]. Intrinsic goals for the GMFR event were positively associated with event achievement whereas extrinsic goals were not. Event achievement was positively associated with post-event autonomous motivation which was associated with post event MVPA. Controlled motivation was neither associated with event achievement nor MVPA.

Discussion

Main finding of this study

MPSE entrants in this study held both intrinsic and extrinsic participation goals and were on average more strongly motivated by autonomous than controlled behavioural regulations. Intrinsic goals were associated with greater event achievement which was in turn associated with greater post-event autonomous motivation. While autonomous post-event motivation based in enjoyment of exercise and identification with its personal benefits was positively associated with self-reported MVPA, controlled motivation (based on guilt or satisfying external demands) was not.

What is already known on this topic?

Although it has been suggested that MPSEs could increase population physical activity,[3] such events could inspire short-term motivation which would not support long-term physical activity.[5,9,12] Previous evidence shows that when MPSE participants were more satisfied with their event experience, they held stronger attitudes toward regular physical activity.[11] People are motivated to participate in MPSEs for enjoyment, health improvement, stress management, strength and endurance, social interaction, challenge and competition[5,6,11,13] and to fundraise for charity.[13] Funk and colleagues identified enjoyment, competition and positive health motivations to be positively associated with running commitment.[11] However, while couched in SDT, previous work has not comprehensively examined the quality of MPSE participants' motivation which the theory allows.

SDT posits that different underlying motivation types and goals predict different behavioural and psychosocial outcomes.[15,21] From this perspective, to contribute to sustained physical activity, it is important that MPSEs help people to foster adaptive motivation (i.e., autonomous motivation and intrinsic goals) which are more likely to be associated with sustained physical activity and behavioural persistence than maladaptive forms of motivation (i.e., controlled motivation and extrinsic goals).[30] Positive associations have been observed between adults' autonomous motivation and objectively-measured physical activity. [16-17]

What this study adds

By assessing MPSE participants' motivation and goal content in line with SDT, this study extends what is known about the motivation of entrants before and after a mass participation running event and the potential correlates of different types of motivation. Our findings build on previous work[5] by suggesting that intrinsic event-based goals (i.e., to improve one's health) were associated with entrants' perceptions of event achievement. This finding is also in-line with research showing that intrinsic goals for physical activity are associated with well-being and positive self-perceptions.[21] In turn, perceptions of event achievement were associated with greater post-event autonomous motivation for physical

activity which, commensurate with previous work[16-17] was associated with greater MVPA. Together, these findings could be important for understanding how to optimise the advertising and marketing of MPSEs (e.g. by highlighting the enjoyment, health, social and charity benefits of participation) to increase the likelihood of entrants' having positive experiences, adaptive post-event motivation and sustained physical activity.

Extrinsic event goals were not associated with event achievement but were associated with low quality controlled post-event motivation for physical activity which was itself not associated with post-event physical activity behaviour. As such, pursuing extrinsic goals (e.g., to improve one's appearance), while perhaps enough to provide some people with short-term motivation to enter and participate in an MPSE, do not seem to be associated with positive event experiences or longer term physical activity for MPSE entrants.

Limitations of this study

Although data were collected at two time points, the sample size was relatively small due to loss to follow up. While our findings provide preliminary evidence for the associations examined, future research should examine the long-term correlates of MPSE motivation and strategies to encourage participation in post-event surveys are needed. Physical activity was self-reported, an objective measurement of physical activity for example, accelerometers[31] would provide more accurate estimates. A prospective study that assesses participants' physical activity, motivation for physical activity and event / exercise goals at different time points would provide clearer temporal evidence. Similarly, a key question is whether MPSEs attract people who are already relatively physically active thus limiting their public health potential. However, measuring the activity levels of entrants is likely to capture short-term training rather than habitual pre-event activity. Embedding a question regarding participation in MPSEs in an existing cohort study which includes repeated objective measurement of physical activity would be a potential solution. Finally, the 8.5 mile distance of the GMFR would be challenging to novice runners which could have influenced who participated in the event. Future research could examine participants' motivation for shorter distance events and different types of events (e.g. cycling).

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Table I. Descriptive statistics and associations between pre-event exercise goals and post-event achievement, motivation and physical activity (n=114).

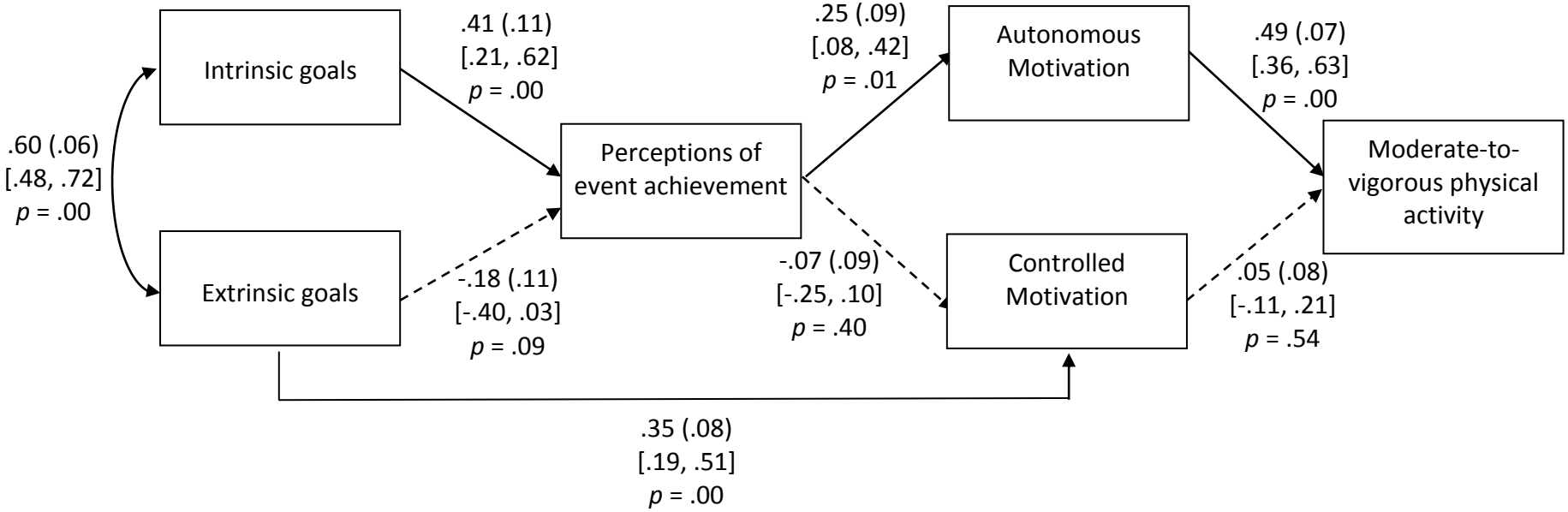
	M (SD)	1	2	3	4	5	6
1. Intrinsic goals	3.78 (1.05)	1					
2. Extrinsic goals	3.03 (1.30)	.60 (.00)	1				
3. Event achievement	23.73 (4.51)	.32 (.00)	.07 (.51)	1			
4. Autonomous motivation	3.03 (.74)	.09 (.35)	-.06 (.51)	.29 (.00)	1		
5. Controlled motivation	0.99 (.55)	.09 (.33)	.33 (.00)	-.01 (.57)	.22 (.02)	1	
6. MVPA*	1142.04 (1025.50)	-.07(.49)	.11 (.26)	.18 (.10)	.43 (.00)	.11 (.26)	1

Exact P values are presented in parentheses

M = mean; SD = standard deviation; MVPA = moderate to vigorous physical activity.

N= 114; *Metabolic Equivalent of Task (MET) minutes per week

Figure 1. Path analysis model of mass participation sporting event pre-event goals and post-event perceptions of achievement, motivation and physical activity



Note: Parameter estimates are standardized (standard error) [95% confidence interval, CI] and exact p-values. Solid arrows represent estimates where 95% CI does not include zero and dashed arrows represent estimates where the 95% CI includes zero. Covariances between error terms of autonomous and controlled motivation was .30 (.09) [95% CI] = .14, .47) *p* = .00.