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Self-Efficacy versus Perceived Enjoyment as Predictors of Physical Activity Behavior

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Abstract

Objective—Self-efficacy and physical activity (PA) enjoyment are related to PA behavior, but it is unclear which is more important and how they interrelate. The purpose of this study was to examine how these two constructs interrelate to influence PA behavior.

Design—Participants were low active adults (n=448) participating in a RCT examining the effect of a PA promotion intervention. Participants completed physical activity, enjoyment, and self-efficacy measures at baseline, six, and 12 months.

Results—Self-efficacy and enjoyment at both baseline and six months predicted PA at 12 months. However, enjoyment was a stronger predictor than self-efficacy in that self-efficacy no longer predicted PA behavior when included alongside enjoyment. In follow-up mediation analyses, enjoyment at six months did not mediate the effect of baseline self-efficacy on 12-month PA; however, six-month self-efficacy mediated the effect of baseline enjoyment on 12-month PA.

Conclusion—Our results indicate that interventions should perhaps initially focus on increasing enjoyment of physical activity. Greater PA enjoyment appears to influence individuals' self-reported ability to engage in regular PA (i.e., higher self-efficacy ratings). Additional research is needed to better understand the interrelationships between self-efficacy and enjoyment and how these constructs affect PA.

Keywords

Physical activity; enjoyment; self-efficacy; mediation

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Only 9% of Americans engage in physical activity at the recommended levels (Tucker, Welk, & Beyler, 2011). Research indicates that although theory-based interventions are effective for increasing physical activity, these intervention trials lead to increases of only 11–40 minutes of physical activity per week (Conn, Hafsdahl, & Mehr, 2011). Furthermore, 28% of intervention studies report meaningful increases in physical activity among participants in the control group (Waters, Reeves, Fjeldsoe, & Eakin, 2012). Few studies have examined the maintenance of physical activity after the intervention has ended (Fjeldsoe, Neuhaus, Winkler, & Eakin, 2011).

There is a need to better understand why some individuals respond to interventions while other do not, and why some control group participants increase their physical activity despite not receiving a physical activity intervention. Theory-based interventions are typically informed by frameworks such as the transtheoretical model (Prochaska & DiClemente, 1983) and social cognitive theory (Bandura, 1997; Buchan, Ollis, Thomas, & Baker, 2012). These theories may inform the content of the intervention but often do not explain varying responses to the intervention and why some participants in the control group increase their physical activity. It is important to identify predictors of responses to interventions in order to understand which factors should be the focus of further intervention efforts.

Self-efficacy and enjoyment as putative *predictors* of physical activity behavior

Two theorized predictors of physical activity initiation are physical activity self-efficacy and enjoyment of physical activity. Studies have supported each of these as predictors of physical activity behavior (Crain, Martinson, Sherwood, & O'Connor, 2010; Hagberg, Lindahl, Nyberg, & Hellenius, 2009; Williams et al., 2006); however, there have been inconsistent findings regarding the importance of self-efficacy (Napolitano et al., 2008). Additional studies have shown that both self-efficacy and enjoyment are predictive of physical activity behavior over time, typically in the context of a behavioral intervention, including studies in which self-efficacy and/or enjoyment have been shown to mediate the effects of a behavioral intervention on physical activity behavior (Crain et al., 2010; Williams et al., 2008). No study, that we are aware of, has examined the *relative* importance of self-efficacy and enjoyment and their *multiple potential interrelationships* as predictors of future physical activity behavior among low active participants. This is important because self-efficacy is a cognitive factor that is theorized to motivate behavior through beliefs in personal agency (Bandura, 1997), whereas enjoyment is an affective factor that impacts behavior through hedonic motivation (i.e., the experience and expectation of pleasure or displeasure; Cabanac, 1992; Kahneman, Wakker, & Sarin, 1997; Williams & Evans, 2014). Specifically, the influence of physical activity enjoyment is consistent with self-determination theory (Ryan & Deci, 2000) and hedonic theory (Cabanac, 1992), which postulates that individuals are motivated by behaviors that are intrinsically rewarding.

Potential interrelationships between self-efficacy and enjoyment

The interrelationship between self-efficacy and enjoyment is of particular theoretical and potentially practical interest. Higher judgments of self-efficacy may lead to increases in

physical activity behavior, in part, by increasing perceived enjoyment of physical activity. This is consistent with self-efficacy theory, which postulates that self-efficacy is the preeminent predictor of behavior, with judgments of self-efficacy influencing behavior both directly and through its effect on other behavioral predictors, including outcome expectancies, goals, and perceived barriers and facilitators for the behavior (Bandura, 1997).

The opposite relationship is also possible: Greater perceived enjoyment of physical activity may lead to higher ratings of self-efficacy, which may lead to a greater likelihood of increasing physical activity behavior. The latter relationship is consistent with the postulation that affect is a source of self-efficacy judgments (Bandura, 1997). Specifically, according to Bandura (1997), affective and physiological states at the time of the behavioral opportunity may serve as sources of self-efficacy judgments. This could involve incidental affect such as one's mood state when making the decision to engage in physical activity or not (e.g., bad mood because of a recent argument with one's boss). Alternatively, it could involve integral affect, such as feelings of anxiety about PA that occur prior to the PA session. For example, recent research suggests that self-persuasion, mastery experiences, and reductions in negative affect states predict physical activity self-efficacy (Warner et al., 2014).

Physical activity enjoyment; however, is not a good example of affect as a source of self-efficacy judgments, because physical activity enjoyment refers to affective *responses* to physical activity and not one's affect prior to initiating physical activity. Indeed, it is logically impossible that the enjoyment (or lack thereof) that one has experienced as a result of previous physical activity experiences would influence his or her perceived capability to engage in physical activity.

On the other hand, perceived enjoyment of physical activity may influence self-efficacy ratings, because such ratings (i.e., what people say they "can do") are a function of broad motivation that includes, but goes beyond, beliefs in personal capability or agency. This self-efficacy-as-motivation view has been proposed by several previous authors (e.g., Cahill, Gallo, Lisman, & Weinstein, 2006; Eastman & Marzillier, 1984; Kirsch, 1985) and is highlighted in a recent paper by Williams and Rhodes (2014). According to the latter view, self-efficacy ratings may mediate the effects of physical activity enjoyment on physical activity behavior because people who rate physical activity as more enjoyable are more likely to say they "can engage in physical activity" (and vice versa). This, in turn, influences their tendency to engage in physical activity. Further research studies are needed that tease apart the potential interrelationships between self-efficacy and enjoyment. This research could help foster a better understanding of the relative utility of agentic versus hedonic theories of motivation.

Present study

The present study is a secondary analysis of a physical activity promotion RCT in which 448 low-active participants were randomized to either a theory-based physical activity intervention or a health/wellness contact control condition both lasting six months with an additional follow-up at 12 months. This study allows for the examination of short-term PA

maintenance given PA was assessed six months following the end of the intervention. The first aim of the present study was to compare self-efficacy and enjoyment, which are representative of agentic and hedonic motivational predictors of behavior, as predictors of future physical activity behavior over 12 months. Specifically, we addressed the following questions: Are both constructs predictive of future physical activity behavior? If so, which is a stronger predictor? And, is there overlap in the variance of physical activity behavior that is explained by the two constructs?

To further elucidate the relative role of the two constructs, our second aim was to test two potential, though not mutually exclusive, mediating relationships. Consistent with self-efficacy theory (Bandura, 1997), we tested if PA enjoyment partially mediated the effect of physical activity self-efficacy on future PA behavior. In the second analysis, consistent with a hedonic motivation perspective and the view that ratings of self-efficacy are an indicator of broad (not just agentic) motivation, we tested if self-efficacy ratings partially mediated the effect of PA enjoyment on future PA behavior. Initial levels of PA, self-efficacy, and enjoyment were controlled for in all analyses in order to examine how changes in enjoyment and self-efficacy influence increases in physical activity over time.

Methods

Participants

Participants were low active women and men ($n = 448$) ages 18 and older ($M_{age} = 43$) from the United States (the state of Minnesota) who had participated in a randomized physical activity intervention trial. For the main trial, participants were randomly assigned to a motivational physical activity intervention based on the transtheoretical model and social cognitive theory or a health/wellness contact control condition both lasting six months with an additional follow-up at 12 months. The interventions were print-based and delivered through the mail. Participants in each condition received a total of 11 mailings during the intervention.

Participants were recruited through print advertisements, emails at a worksite, and letters sent to potential participants identified through an electronic medical record. Exclusion criteria included a medical condition that would interfere with physical activity, or engaging in physical activity for more than 90 minutes per week (on average participants reported 24 minutes of physical activity per week at baseline). Eighty-six percent of the participants were retained at six months and 80% at 12 months (defined as completing the Physical Activity Recall Interview). In the overall trial, participants in the physical activity intervention reported significantly greater increases in weekly minutes of physical activity from baseline to six and 12 months than participants in the health/wellness contact control condition (Lewis, Williams, Martinson, Dunsiger, & Marcus, 2013). This study was approved by the HealthPartners Research Foundation's Institutional Review Board and all participants signed informed consent forms.

Measures

Physical Activity Recall Interview—The 7-Day Physical Activity Recall Interview was administered over the telephone at baseline, six, and 12 months (PAR; Blair et al., 1985; Sallis et al., 1985). Specifically, the entire PAR was administered to assess minutes of sleep, sitting, and physical activity for the previous week. Additional information regarding the previous three months was also assessed, including sitting time, walking time, walking pace, frequency and duration of strength and flexibility exercises, and average number of flights of stairs climbed per day. The PAR is considered the gold standard for assessing physical activity. Research indicates that the PAR is reliable and valid among adults (Pereira et al., 1997). One study examined the test re-test reliability among two interviewers who administered the interview on the same day and found a reliability of 0.86 (Gross et al., 1990). Regarding validity, the Caltrac (i.e., objective physical activity monitor) has been shown to significantly correlate with the PAR (Jacobs et al., 1993). Additionally, the telephone-based PAR significantly correlates with the face-to-face PAR ($r = .96$; Hayden-Wade, Coleman, Sallis, & Armstrong, 2003).

Physical Activity Enjoyment Scale (PACES)—The 18-item PACES scale was administered to measure perceived attributes of physical activity. Examples of items include “I enjoy it” and “I feel bored.” This measure has good reliability and validity (Kendzierski & DeCarlo, 1991). The internal consistency for the current study was 0.94 at baseline and 0.96 at six months. Enjoyment has been predictive of PA in prior studies with samples similar to ours (Williams et al., 2006).

Self-efficacy—Self-efficacy was assessed using a five-item measure that assesses one’s confidence they can engage in physical activity in five different situations. This scale measures participants’ confidence in participating in physical activity in five different situations (i.e., vacation, feeling tired, bad mood, not having enough time, and bad weather; Marcus et al., 1992). The internal consistency for the current study was 0.81 at baseline and 0.84 at six months. This measure has been shown to predict physical activity in previous studies (Williams et al., 2008).

Procedure

For the current study, participants completed the 7-Day Physical Activity Recall Interview (PAR), enjoyment, and self-efficacy measures at baseline, six, and 12 months. Participants were mailed the questionnaires and were given self-addressed stamped envelopes to return the questionnaires. The PAR was administered over the telephone. Participants received 10 US dollars for completing each of their monthly questionnaires, 15 US dollars for the six-month assessment, 15 US dollars for the 12-month assessment, and an additional 15 US dollars if they completed both the six and 12-month assessments. Participants signed a consent form and written physician consent was obtained for each participant.

Data analysis

Bivariate correlations were calculated to examine the relationship between enjoyment and self-efficacy. Linear regression analyses were used to examine the effect of physical activity enjoyment and self-efficacy on physical activity. Mediator analysis was conducted to

examine if, consistent with an agentic motivation perspective (i.e., self-efficacy theory), enjoyment mediated the effect of self-efficacy on physical activity. A separate mediator analysis was conducted to determine if, consistent with a hedonic motivation perspective, motivation as captured by self-efficacy ratings mediated the effect of enjoyment on physical activity. As recommended by Preacher and Hayes (2008), a series of regression analyses and bootstrapping were conducted to examine mediation. Baseline minutes of physical activity and condition assignment (motivational physical activity intervention vs. health/wellness contact control condition) were both controlled for in the mediation analysis. Participants who had missing data related to the particular analysis were excluded from the analysis.

Results

Sample characteristics

The majority of the participants were women (87.1%), Caucasian (69.9%), had a college education (57.8%), reported an annual household income of over \$50k (54.0%), and were married (51.6%). In the main trial, 224 participants had been randomized to the physical activity condition and 224 to the health/wellness contact control. Eighty-six percent of the sample was retained at six months and 80% at 12 months (defined as completing the 7-Day Physical Activity Recall Interview). Based on the PAR, participants averaged 23.6 ($SD = 27.3$) minutes of physical activity per week at baseline ($n = 448$), 152.2 ($SD = 144.2$) at six months ($n = 407$), and 170.5 ($SD = 148.8$) at 12 months ($n = 352$). Participants averaged 2.6 ($SD = 0.8$) on the self-efficacy measure at baseline ($n = 448$) and 2.8 ($SD = 0.9$) at six months ($n = 308$). Participants averaged 82.0 ($SD = 18.6$) on the enjoyment measure at baseline ($n = 443$) and 88.4 ($SD = 20.8$) at six months ($n = 256$).

Bivariate correlations between enjoyment, self-efficacy, and physical activity behavior

A bivariate correlation matrix is presented in Table 1, which examines the relationship between self-efficacy, enjoyment, and physical activity behavior. Self-efficacy and enjoyment were correlated with each other at both time points. Baseline physical activity correlated with self-efficacy at six months but did not correlate with self-efficacy at baseline or enjoyment at either time point. Six- and 12-month physical activity correlated with self-efficacy and enjoyment at both time points. The sample size in this table differed from the other analyses depending on the measures needed for a particular analysis.

Self-efficacy and enjoyment as separate predictors of physical activity

Table 2 summarizes the effect of both six- and 12-month enjoyment and self-efficacy on 12-month physical activity (controlling for baseline levels of physical activity) when each predictor variable was entered separately into the equation. Table 3 summarizes the effect of baseline and six-month enjoyment and self-efficacy on 12 month PA when both are entered together into the same equation. Specifically, self-efficacy becomes non-significant when enjoyment for both baseline and six months are entered as predictors of 12 month PA.

Mediation analyses

Combined Analyses

We conducted mediation analyses to investigate possible ways in which self-efficacy and enjoyment may interrelate to influence PA behavior because: (1) both PA enjoyment and self-efficacy were predictive of PA behavior; (2) self-efficacy no longer predicted PA when included in the regression analyses alongside PA enjoyment; and (3) PA enjoyment and self-efficacy were correlated. For example, consistent with self-efficacy theory (Bandura, 1997), it is possible that self-efficacy was no longer predictive of PA behavior when PA enjoyment was included in the regression equation because enjoyment mediated the effect of self-efficacy on PA behavior. However, this hypothesis cannot be tested when self-efficacy and enjoyment are both assessed at the same time point as in the above analyses. Thus, consistent with self-efficacy theory, we tested whether six month enjoyment mediated the effect of baseline self-efficacy on 12 month physical activity (see Figure 1). First, baseline self-efficacy was not associated with six-month enjoyment, $t = .47$ (95% Confidence Interval (CI): $-2.294, .3.734$), when controlling for condition assignment, baseline PA, and baseline enjoyment (path *a*). Second, six-month PA enjoyment was positively related to 12 month PA behavior, $t = 4.08$ (95% CI: $1.030, 2.958$), when controlling for baseline self-efficacy, condition assignment, baseline PA, and baseline PA enjoyment (path *b*). Since path *a* was not significant, additional mediation analyses were not conducted. These findings do not support the interpretation of our initial analyses that self-efficacy was no longer predictive of PA behavior when PA enjoyment was included in the regression equation because PA enjoyment did not mediate the effect of self-efficacy on PA behavior.

The control variables are summarized below, which include the standardized regression coefficients and the standard errors in parentheses. The control variables for path *a* (self-efficacy at baseline predicting enjoyment at six months) included condition, $\beta = -.104$ (2.287), ns, baseline PA minutes, $\beta = -.033$ (.045), ns, and enjoyment at baseline, $\beta = .456$ (.069), $p < .001$. The control variables for path *b* (enjoyment at six months predicting PA at 12 months) included self-efficacy at baseline, $\beta = .029$ (11.254), ns, condition, $\beta = -.060$ (17.540), ns, baseline PA minutes, $\beta = .024$ (.341), ns, and enjoyment at baseline, $\beta = .004$ (.579), ns. The control variables for path *c* (self-efficacy at baseline predicting PA at 12 months) included condition, $\beta = -.119$ (15.557), $p < .05$, and baseline PA minutes, $\beta = .139$ (.285), $p < .01$.

Next, multiple regression analyses were used to test if, consistent with a hedonic motivation perspective, six month self-efficacy ratings mediated the effect of baseline PA enjoyment on 12 month PA behavior (see Figure 2). First, baseline PA enjoyment was positively associated with six-month self-efficacy (95% CI: $.003, .013$), when controlling for condition assignment, baseline PA, and baseline self-efficacy (path *a*). Second, six-month self-efficacy was positively related to 12-month PA behavior (95% CI: $13.810, 57.05$), when controlling for enjoyment at baseline, condition assignment, baseline PA, and baseline self-efficacy (path *b*). Since both the *a*-path and *b*-path were significant, bootstrapping was used with a bias-corrected confidence estimation (95% confidence intervals) to examine mediation. The mediation analysis confirmed that self-efficacy at six months mediated the effect of

enjoyment at baseline on 12-month PA behavior ($ab = .279$, $CI = .109, .646$). Additionally, the direct effect of baseline PA enjoyment on 12 month PA became non-significant when controlling for six month self-efficacy ($c = .985$, $CI = -.004, 1.975$), which suggested full mediation. These findings support a hedonic motivation conceptualization in which PA enjoyment exerts its effects on PA behavior through motivation as captured by whether people say they can or cannot engage in regular PA.

The control variables are summarized below, which include the standardized regression coefficients and the standard errors in parentheses. The control variables for path *a* (enjoyment at baseline predicting self-efficacy at six months) included condition, $\beta = -.219$ (.088), $p < .001$, baseline PA minutes, $\beta = .106$ (.002), $p < .05$, and self-efficacy at baseline, $\beta = .334$ (.058), $p < .001$. The control variables for path *b* (self-efficacy at six months predicting PA at 12 months) included enjoyment at baseline, $\beta = .125$ (.503), ns, condition, $\beta = -.104$ (17.043), ns, baseline PA minutes, $\beta = .096$ (.305), ns, and self-efficacy at baseline, $\beta = -.030$ (11.691), ns. The control variables for path *c* (enjoyment at baseline predicting PA at 12 months) included condition, $\beta = -.108$ (15.342), $p < .05$ and baseline PA minutes, $\beta = .124$ (.280), $p < .05$.

Sensitivity Analysis

We conducted a sensitivity analysis to determine if similar results would occur when the mediators were analyzed separately for each condition of the study. Results were similar within each condition when compared to the full sample. That is, self-efficacy was a mediator of the effect of enjoyment on PA, whereas the opposite was not true: Enjoyment was not a mediator of the effects of self-efficacy on PA. A caveat is that for the intervention only analysis, statistical significance was not quite achieved when examining self-efficacy as a mediator of the effect of enjoyment on PA (two p values were $p < .10$ rather than $p < .05$), which is likely due to the reduced statistical power. This sensitivity analysis is described in more detail below.

We first tested whether six month enjoyment mediated the effect of baseline self-efficacy on 12 month physical activity for the intervention participants. Baseline self-efficacy was not associated with six-month enjoyment, $t = -.68$ (95% Confidence Interval (CI): $-5.985, .2.934$), when controlling for baseline PA, and baseline enjoyment (path *a*). We conducted the same analysis for the control participants and similarly found that baseline self-efficacy was not associated with six-month enjoyment, $t = 1.20$ (95% Confidence Interval (CI): $-1.642, .6.650$). Since path *a* was not significant for either condition, additional mediation analyses were not conducted.

Next we tested whether six month self-efficacy mediated the effect of baseline enjoyment on 12 month physical activity for the intervention participants. Baseline PA enjoyment was positively marginally associated with six-month self-efficacy, $t = 1.66$ ($p = .099$; 95% CI: $-.001, .014$), when controlling for baseline PA and baseline self-efficacy (path *a*). Second, six-month self-efficacy was positively related to 12-month PA behavior, $t = 1.71$ ($p = .090$; 95% CI: $-4.578, .62.823$), when controlling for enjoyment at baseline, baseline PA, and baseline self-efficacy (path *b*). Since both the *a*-path and *b*-path were significant, bootstrapping was used with a bias-corrected confidence estimation (95% confidence intervals) to examine

mediation. The mediation analysis confirmed that self-efficacy at six months mediated the effect of enjoyment at baseline on 12-month PA behavior ($ab = .180$, CI: $-.005, .605$). Additionally, the direct effect of baseline PA enjoyment on 12 month PA became non-significant when controlling for six month self-efficacy ($c = .844$, CI: $-.608, 2.296$), which suggested full mediation.

Finally we tested whether six month self-efficacy mediated the effect of baseline enjoyment on 12 month physical activity for the control participants. Baseline PA enjoyment was positively associated with six-month self-efficacy, $t = 2.47$ ($p = .015$; 95% CI: $-.002, .018$), when controlling for baseline PA and baseline self-efficacy (path *a*). Second, six-month self-efficacy was positively related to 12-month PA behavior, $t = 2.97$ ($p = .004$; 95% CI: $14.174, 70.720$), when controlling for enjoyment at baseline, baseline PA, and baseline self-efficacy (path *b*). Since both the *a*-path and *b*-path were significant, bootstrapping was used with a bias-corrected confidence estimation (95% confidence intervals) to examine mediation. The mediation analysis confirmed that self-efficacy at six months mediated the effect of enjoyment at baseline on 12-month PA behavior ($ab = .429$, CI: $.075, 1.134$). Additionally, the direct effect of baseline PA enjoyment on 12 month PA became non-significant when controlling for six month self-efficacy ($c = 1.123$, CI: $-.253, 2.499$), which suggested full mediation.

Discussion

The purpose of this study was to examine if PA self-efficacy and enjoyment were mediators of physical activity behavior. Results indicated that self-efficacy and enjoyment of physical activity at both baseline and six months were predictive of 12-month physical activity when controlling for baseline physical activity. These findings are consistent with other studies which have found that enjoyment and self-efficacy are important predictors of physical activity behavior (Crain et al., 2010, Hagberg et al., 2009, Williams et al., 2006). However, when both self-efficacy and enjoyment were included in the same regression analysis, self-efficacy was no longer predictive of PA, but enjoyment remained a significant predictor of PA. Because self-efficacy and enjoyment were also correlated with each other, we tested the possibility that, consistent with self-efficacy theory (Bandura, 1997), enjoyment mediated the effect of self-efficacy on PA behavior. This was not the case; however, as baseline self-efficacy was not predictive of six-month enjoyment when controlling for baseline enjoyment. Thus, our finding that enjoyment was a stronger predictor of PA behavior than self-efficacy cannot be accounted for by a mediation model in which self-efficacy exerts its effects on PA behavior through enjoyment. No previous study has examined the relative influence of enjoyment and self-efficacy on physical activity within the same study and therefore, additional research was needed to further support this finding.

We next tested the opposite mediation model and indeed showed that physical activity enjoyment exerted its effects on physical activity behavior through self-efficacy. This finding is inconsistent with previous studies indicating that self-efficacy is an important predictor of physical activity initiation (Crain et al., 2010; Hagberg et al., 2009; Williams et al., 2006). This mediation model is also not consistent with self-efficacy theory, because it is not logical that prior enjoyment in *response* to PA would influence one's perceived capability to

perform PA. This alternative mediation model is; however, consistent with a self-efficacy-as-motivation view (Williams & Rhodes, 2014) in which ratings of self-efficacy are indicative of broader motivation, such that those who report greater enjoyment for PA are more motivated to engage in PA and are thus more likely to say that they “can engage in PA” in the face of potential barriers (i.e., self-efficacy ratings).

There are several implications for intervention research and practice based on our findings. First, the findings suggest that PA enjoyment may be a more important predictor of PA behavior than self-efficacy; however, additional research is needed. Practitioners should perhaps emphasize people’s enjoyment of PA over their perceived capability to perform PA. Likewise, while previous researchers have postulated that focusing on increasing self-efficacy may help individuals adopt physical activity, our findings indicate that enjoyment may be important to target first. One potential problem is that enjoyment could be considered an “intrinsic trait” in that it might be difficult to change one’s perception of whether or not physical activity is enjoyable. Therefore, researchers and practitioners need to be creative regarding how to work with individuals to improve their enjoyment. Participants may increase enjoyment by developing preferences for certain types of physical activities. Researchers or practitioners should encourage individuals to try a variety of activities, and to not only self-monitor physical activity progress, but also enjoyment.

There are several limitations to this study. First, participants were mailed the self-efficacy and enjoyment questionnaires but completed the PAR over the telephone. Therefore, completion rates for the PAR were higher when compared to the questionnaires. Participants received incentives for completing their six-month assessment measures, but adherence was still not optimal. Second, a majority of our sample consisted of women, and may not be generalizable to the wider population of sedentary adults given our stringent inclusion/exclusion criteria. Third, participants in this study had been randomized to a physical activity intervention or control, which may have influenced the results. However, this limitation was addressed by controlling for condition assignment in the mediator analyses. Finally, our study did not examine sources of enjoyment or self-efficacy, precluding our ability to identify and recommend specific strategies for enhancing these psychosocial constructs. Furthermore, other potential sources of motivation (e.g., intention) were not assessed in this study. Therefore, it is unclear how other sources of motivation may interact with self-efficacy and enjoyment to influence future physical activity behavior.

Our findings challenge the traditional interpretation regarding the importance of self-efficacy. Specifically, our findings do not support the idea that targeting self-efficacy directly will increase physical activity. It appears that interventions should target enjoyment first, which will likely lead to increases in self-efficacy ratings, which may reflect a broader motivation to engage in PA rather than perceived capability per se. Intervention research studies are needed that examine the efficacy of theory-based intervention strategies that specifically target enjoyment. Additionally, future studies should further examine how self-efficacy and enjoyment may interact with other potentially important variables such as outcome expectancies for physical activity. Additional intervention research is needed that examines the effect of intervention strategies for improving PA enjoyment and how increased enjoyment leads to physical activity behavior change.

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Figure 1.

Six Month Enjoyment Mediating the Effect of Baseline Self-Efficacy on 12 month Physical Activity. Note. Standardized regression coefficients are reported and the standard errors are in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$. PA=Physical Activity.

Figure 2.

Six Month Self-Efficacy Mediating the Effect of Baseline Enjoyment on 12 month Physical Activity. Note. Standardized regression coefficients are reported and the standard errors are in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$. PA=Physical Activity.

Table 1

Bivariate Correlation Matrix for Enjoyment and Self-Efficacy

	1	2	3	4	5	6
1. Baseline PA Enjoyment						
2. Baseline PA Self-Efficacy	.363 ***					
3. Six Month PA Enjoyment	.478 ***	.208 **				
4. Six Month PA Self-Efficacy	.297 ***	.403 ***	.537 ***			
5. Baseline PA Minutes per Week	.061	.075	.010	.142 *		
6. Six Month PA Minutes per Week	.191 ***	.136 **	.345 ***	.379 ***	.110 *	
7. 12 Month PA Minutes per Week	.253 ***	.117 *	.313 ***	.290 ***	.152 **	.378 ***

PA=Physical activity;

*
p < .05,**
p < .01,***
p < .001

Table 2

Self-Efficacy and Enjoyment as Separate Predictors of 12 Month Physical Activity

Variable	Beta [*]	SE	P-value
Baseline PA	0.128	0.281	.014
Baseline PA Enjoyment	0.241	0.414	.000

Variable	Beta [*]	SE	P-value
Baseline PA	0.143	0.287	.007
Baseline PA Self-Efficacy	0.105	9.430	.048

Variable	Beta [*]	SE	P-value
Six Month PA	0.266	0.066	.000
Six Month PA Enjoyment	0.242	0.418	.000

Variable	Beta [*]	SE	P-value
Six Month PA	0.331	0.064	.000
Six Month PA Self-Efficacy	0.173	9.310	.004

PA=Physical Activity;

*
Betas are standardized linear regression coefficients

Table 3

Self-Efficacy and Enjoyment as Combined Predictors of 12 Month Physical Activity

Variable	Beta [*]	SE	P-value
Baseline PA	0.127	0.282	.015
Baseline PA Enjoyment	0.235	0.449	.000
Baseline PA Self-Efficacy	0.016	10.119	.773

Variable	Beta [*]	SE	P-value
Six Month PA	0.256	0.068	.000
Six Month PA Enjoyment	0.214	0.473	.003
Six Month Self-Efficacy	0.054	11.288	.460

PA=Physical Activity;

* Betas are standardized linear regression coefficients