Discrepancies in Exercise Intention and Expectation: Theoretical and Applied Issues

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Abstract

Intention measures often assess behavioral expectation more than behavioral intention. Warshaw and Davis (1985) theorize that expectation takes anticipated fluctuations in the commitment to the intention and perceived behavioral control (PBC) interactions into consideration over intention. Some research has provided indirect evidence for this theorizing, but no study had directly tested this proposition. Therefore, the purpose of our study was to examine potential moderators of intention and expectation relations in the exercise domain. Participants were 241 undergraduate students who completed measures of intention, expectation, commitment to their intentions, the theory of planned behavior (affective attitude, instrumental attitude, subjective norm, PBC) and a two-week follow-up of behavior. Results showed that commitment to the intention and PBC moderated the relationship between intention and expectation ($p < .01$). Specifically, those individuals with low intention commitment and low PBC had lower exercise expectations than intentions ($d > .19$) and larger expectation–behavior correlations than intention-behavior correlations ($q > .09$). In contrast, those individuals with medium and high levels of intention commitment and PBC had expectations equal to their intentions and no difference between expectation–behavior and intention-behavior correlations. Based on these results and the results of previous studies, we recommend that differences between intention and expectation items be taken into account in the future, particularly for those individuals with low intention commitment and PBC.

Intention to perform a behavior is theorized as the proximal determinant of actually performing a behavior in many of our leading theories of social cognition such as protection motivation theory (Rogers, 1984), the health belief model (Rosenstock, 1974), the theory of reasoned action (Fishbein & Ajzen, 1975), and the theory of planned behavior (Ajzen, 1985, 1991). Overall, research investigating the effect of intention on future behavior has demonstrated a significant and large effect, thus supporting the tenets of many social cognitive theories. For example, recent reviews of the theory of planned behavior (TPB) demonstrate that intention explains 30% of the variance in future behavior (see Armitage & Conner, 2001; Godin & Kok, 1996) which meets Cohen's (1992) definition of a large effect size ($r > .50$).

One debate in the intention-behavior literature, however, is whether measurement of intention in social cognitive theories actually captures the measurement domain of behavioral expectation more than behavioral intention. For example, Warshaw and Davis (1985) define behavioral intention as "the degree to which a person has formulated conscious plans to perform or not to perform some specified future behavior" (p. 215) and define behavioral expectation as "the individuals estimation of the likelihood that he or she actually will perform some specified future behavior" (p. 215). Using these definitions, Warshaw and Davis (1985, 1986) and Davis and Warshaw (1992) subsequently argue that the items used to measure behavioral intention in theories such as Reasoned Action (Ajzen & Fishbein, 1980) and Planned Behavior (Ajzen, 1991; 2002) often interchange the assessment of behavioral expectation and behavioral intention. For example, recommended intention items include "planning" and "intention" (i.e., intention items) as well as "expectation" and "likelihood" items (i.e., expectation items). Further, a series of studies used to investigate what participants actually think when they are responding to these items demonstrated

that behavioral expectation is often measured instead of behavioral intention (Davis & Warshaw, 1992).

Beyond definitional queries between intention and expectation, Warshaw and Davis (1985) also theorized that behavioral expectation should explain more variance in behavior than behavioral intention because people take other factors (e.g., anticipated changes in intentions, control limitations) into account when making behavioral expectations. Essentially, behavioral expectation may act as a perceived proxy measure for future behavior by taking temporal fluctuations in motivation and interactions with volitional control factors into consideration. In support of this theorizing, research conducted to examine predictive differences between intention and expectation with behavior have shown significant, albeit small, differences in the superiority of behavioral expectation over behavioral intention (e.g., Courneya & McAuley, 1994; Warshaw & Davis, 1985, 1986). Further, inductive content analysis on the information participants draw upon when answering intention and expectation items suggested that intention is based more on behavioral beliefs and expectation is based more on temporal circumstances and past experiences with the behavior (Gordon, 1990). Finally, a study by Konerding (2001) demonstrated that participants decrease their behavioral expectations as perceived behavioral control decreases. These studies at least partially support the original theorizing by Warshaw and Davis (1985) that expectations take volitional control factors into account more than intentions.

Still, some researchers have found measures of intention and expectation (sometimes referred to as self-prediction) synonymous. For example, Conner and Sparks (1996) have found that intention and expectation items reflect a single factor (>70% variance) in exploratory factor analysis. Ajzen (2002) and Fishbein (1997) appear to consider intention and expectation items as interchangeable measures of the same construct. Finally, differences in intention-behavior and

expectation-behavior correlations are small (generally <.10 r^2 difference) and sometimes inconsistent (Armitage & Conner, 2001; Warshaw & Davis, 1985).

We believe differences between behavioral intention and behavioral expectation may be important in theoretical and applied research. An understanding of these constructs, however, may be more complicated than considering them as either distinct or synonymous. Using the operational difference between intention and expectation put forward by Warshaw and Davis (1985), expectation should begin to diverge from intention when factors such as perceived control over the behavior, and commitment to the intention are in question. Still, if commitment to the intention and perceived control over the behavior are high, then theoretically, intention and expectation should converge. No research, however, has directly tested this theorizing.

This logic mirrors the conceived relationship between intention and behavior put fourth in the Theory of Planned Behavior (TPB; Ajzen, 1991) if behavioral expectation is also considered as a forecasted proxy for actual behavior. In this case, intention-behavior relations should be similar to intention-expectation relations. For example, intention temporal stability, and the construct of perceived behavioral control (PBC) are theorized as key moderators of intention-behavior relations. A recent meta-analysis of research using the TPB found that PBC moderated the intention-behavior relationship in about half of the studies conducted (Armitage & Conner, 2001). Several studies have demonstrated the importance of intention stability on the intention-behavior relationship (Sheeran, 2002; Sheeran & Abraham, 2003). For example, Sheeran and Orbell's (1998) meta-analytic study showed that proximal intentions predicted health behavior more accurately than distal intentions. Similarly, Courneya and McAuley (1993) demonstrated that short-term exercise intentions have stronger effects on behavior than long-term intentions. In a prospective study, Conner, Sheeran, Norman, and Armitage (2000) pointed out that stable intentions were stronger predictors of health

behavior than unstable intentions. Overall, this research shows that 'stability' influences the predictive validity of intention on behavior. No research, however, has examined whether the intention-expectation relationship mirrors these findings of the intention-behavior relationship.

As well, intention-behavior discrepancies appear to be the result of intenders not acting, rather than non-intenders acting (Godin, Shephard, and Colantonio, 1986; Rhodes, Courneya & Jones, 2003; Sheeran, 2002). If intention-expectation relations mimic intention-behavior relations, then intention-expectation deviations should arise from intenders expecting to do less, rather than non-intenders expecting to do more. No research has examined this finding at present.

Finally, understanding differences between intention and expectation may have applied merit, particularly in the case of health behavior promotion. When an individual intends to exercise three times per week but expects to exercise only once a week or not at all, the discrepancy highlights a potential problem. Research focused on predictors of intention-behavior translation has been mixed. Orbell and Sheeran (1998) did not find social cognitive variables predicted cancer screening, but social cognitive correlates of intention translation have been identified in the exercise domain (Godin, Shephard et al., 1986; Rhodes et al., 2003; Sheeran, 2002). Assuming that behavioral expectation is a perceived proxy for actual future behavior, discrepancies between intention and expectation may be early warning signs of intention translation difficulties. Clearly, results of previous analyses (e.g., Armitage & Conner, 2001; Courneya & McAuley, 1994; Warshaw & Davis, 1985,1986) demonstrate that behavioral expectation still deviates from future actual behavior and thus does not act as a consistently good "proxy" for behavior. Still, understanding predictors of the intention-expectation discrepancy should highlight key constructs for promoting intention translation a priori. Currently, no research has explored predictors of the intention-expectation discrepancy.

Therefore, the purpose of our study was to examine the discrepancy between behavioral intention and behavioral expectation and the potential reasons for this discrepancy. First, based on the theorizing of Warshaw and Davis (1985) that expectation differs from intention due to greater consideration of motivation, we hypothesized that the intention-expectation discrepancy would be less for individuals who responded on the extreme poles of the intention scale (e.g., strongly agree, strongly disagree) than for those individuals who responded closer to the center of the scale (e.g., slightly agree, slightly disagree, neutral). This logic also mirrors the theorizing of intention-behavior relations and attitude extremity. Specifically, attitude extremity has been found to moderate the attitude-behavior relationship with more extreme attitudes resulting in a larger attitude-behavior relationship than less extreme attitudes (e.g., Abelson, 1995; Holland, Verplanken & Knippenberg, 2002).

Second, our study was designed to examine the theorizing by Warshaw and Davis (1985) that expectation differs from intention due to greater consideration of perceived temporal fluctuations in motivation and perceived control. We hypothesized that perceived commitment to one's intentions and PBC would moderate the intention-expectation relationship. Specifically, we hypothesized that the relationship between intention and expectation would be larger than for individuals with a strong commitment to their intentions and high-perceived control than those individuals with lower perceived commitment to one's intentions and PBC.

Further, we hypothesized that individuals with low commitment to their intentions and low perceived control should report lower mean scores on expectation than intention. In contrast, we hypothesized that no differences in mean scores between intention and expectation would be evident for individuals who report high intention commitment and PBC. Our hypotheses were based on the results of intention-behavior discrepancies from intenders not acting, rather than non-

intenders acting (Godin, Shephard et al., 1986; Rhodes et al., 2003; Sheeran, 2002). If intention-expectation relations mimic intention-behavior relations, then intention-expectation deviations should arise from intenders expecting to do less, rather than non-intenders expecting to do more.

Also based on the theorizing of Warshaw and Davis (1985), we hypothesized that expectation-behavior relations would be larger than intention-behavior relations under conditions of low control and low intention commitment. We hypothesized that expectation-behavior relations and intention-behavior relations would not differ under conditions of high intention commitment and high PBC. This research objective extends the previous research on intention and expectation relations with behavior by including conditions of intention commitment and PBC. Previous research may be equivocal on the intention-behavior and expectation-behavior relationship (e.g., Armitage & Conner, 2001; Warshaw & Davis, 1985) because it failed to consider these conditions.

Finally, we wished to explore potential predictors of the intention-expectation discrepancy. Social cognitive constructs included in the analysis were based on Warshaw and Davis' (1985) notion of commitment to the behavioral intention across time (i.e., anticipated motivational fluctuation) and the constructs of the theory of planned behavior (affective attitude, instrumental attitude, subjective norm, PBC; Ajzen, 2002).

We focused our study on exercise behavior. There is extensive literature indicating that regular exercise is an effective preventive strategy against obesity, type 2 diabetes, breast cancer, cardiovascular disease, stroke, hypertension, colon cancer, osteoporosis, and several psychological disorders (Blair & Brodney, 1999; Bouchard & Shephard, 1994; U.S. Department of Health and Human Services, 1996). Despite this information, the majority of adults do not meet the minimal requirements for physical activity wherein health benefits are thought to occur (Canadian Fitness and Lifestyle Research Institute, 2001; U.S. Department of Health and Human Services, 1996).

Thus, there is a need to understand exercise motivation in order to develop appropriate intervention strategies.

Method

Participants and Procedures

Two hundred and forty-one students participated in the study for extra credit in their introductory psychology and health psychology courses. The participants attended large group sessions during October and November 2002, completing self-report measures of the TPB. A follow-up of self-reported exercise behavior was gathered two weeks later via additional group sessions and email. The mean age of participants was 20.42 (SD = 4.83 yrs), 80% were female, and the mean year in university for the sample was 2.51 (SD = 1.27).

Instruments

Regular exercise was defined for all participants as activities performed at least at a moderate intensity, 4 or more times per week, accumulating at least 30 minutes each time. This definition was chosen based on Health Canada's position stand for recommended weekly exercise among adults (Health Canada, 2002). Participants were asked to use this definition when answering all questions.

Attitude towards regular exercise was measured using 7-point bipolar adjective items as suggested by Ajzen and Fishbein (1980). Three items were used to tap the instrumental aspect (e.g., useful-useless, wise-foolish, beneficial-harmful) and three items were used to tap the affective (enjoyable-unenjoyable, pleasant-unpleasant, interesting-boring) aspect of attitude as suggested by Ajzen (2002). The statement that preceded the adjectives was "For me, regular exercise over the next two weeks would be." Internal consistency was acceptable for both the affective attitude (α = .77) and instrumental attitude (α = .75) scales.

Subjective norm was measured by three items on a 7-point scale that ranged from 1 (strongly disagree) to 7 (strongly agree). Two items measured the injunctive component of subjective norm and one item measured the descriptive component of subjective norm based on the recommendation of Ajzen (2002). These components were collapsed into a formative scale based on the findings of Rhodes and Courneya (2003a). The items were: 1) "Most people who are important to me want me to exercise regularly over the next 2 weeks," 2) "Most people who are important to me do not think I should exercise regularly over the next 2 weeks (reverse scored)," and 3) "Most people who are important to me will exercise regularly over the next 2 weeks." Internal consistency of this three-item scale was acceptable at $\alpha = .72$.

Perceived behavioral control was measured by two questions recommended by Rhodes and Courneya (2003b) and traditionally used to measure PBC (Ajzen, 2002). Specifically, both PBC items included a phrase to hold motivation to a positive constant (e.g., if I wanted to…) in order to control for measurement redundancy with intention (Rhodes & Courneya, 2003b, 2004). The PBC items were: 1) "How much personal control do you feel you have over exercising regularly in the next 2 weeks if you really wanted to?"; on a 7-point scale ranging from 1 (very little control) to 7 (complete control), and 2) "How much do you feel that exercising regularly over the next 2 weeks is beyond your control even if you really wanted to?" (reversed scored); on a 7-point scale ranging from 1 (not at all) to 7 (very much). Internal consistency of the scale was $\alpha = .76$.

Exercise intention was assessed by two items. These intention items were 1) "I plan to exercise regularly over the next 2 weeks," and 2) "I intend to exercise regularly over the next 2 weeks," on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency for the scale was excellent ($\alpha = .99$).

Exercise expectation was assessed by two items. These items were 1) "I expect to exercise regularly over the next 2 weeks"; on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree), and 2) "I am likely to exercise regularly over the next 2 weeks"; on a 7-point scale ranging from 1 (very unlikely) to 7 (very likely). Internal consistency for the scale was excellent (α = .97).

Commitment to one's exercise intentions was also assessed by two items. This measure was created exclusively for this study based upon our interpretation of the theorizing of Warshaw and Davis (1985). The two items were: 1) "I am likely to follow through with my exercise plans over the next 2 weeks," on a 7-point scale ranging from 1 (very unlikely) to 7 (very likely); and 2) "I am confident that I can fulfill my exercise intentions over the next 2 weeks," on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency for the scale was α = .87.

Exercise behavior was measured using the Godin Leisure Time Exercise Questionnaire (Godin, Jobin, & Bouillon, 1986; Godin & Shephard, 1985). The instrument contains three open ended questions covering the frequency of mild (e.g., easy walking), moderate (e.g., fast walking), and strenuous (e.g., jogging) exercise completed during free time for at least 30 minutes duration in a typical week. Strenuous and moderate exercise frequencies were aggregated to produce a total exercise frequency at or above moderate intensity. Mild intensity exercise was not included as an indicator of exercise behavior due to its incongruence with our definition of regular exercise.

Results

Descriptives and correlations for the constructs of interest are detailed in Table 1. Overall, mean scores were generally on the higher end of the 7-point scale continuum (4.64 – 6.33) and variability was generally over a single point spread for one standard deviation (0.73 – 2.18). All

correlations between constructs were significant ($p < .05$) but ranged from .15 (affective attitude & subjective norm, intention commitment & subjective norm) to .93 (intention & expectation).

Within-Measure Differences Between Intention and Expectation

Our first analyses of the intention–expectation relation examined discrepancies between the two constructs as a result of whether participants responded on the intention scale poles or the scale center. First, we created a basic measure of intention extremity by rescoring extreme responses on the intention measure at one pole (4; e.g., strongly disagree and strongly agree) with variability descending to the neutral point of the scale on the other pole (1). This rescored measure was then correlated with the expectation-intention discrepancy (i.e., expectation-intention) and resulted in a significant ($p < .01$) correlation of .31.

Second, in order to perform a finer examination of expectation and intention relations, we separated participants by intended exercise and expected exercise responses. Categories for the separation were: 1) those whose expectations fell short of their intentions, 2) those whose intentions were equal to their expectations 3) those whose expectations exceeded their intentions. Intention responses were subsequently categorized as low (i.e., 1-2), neutral (i.e., 3-5), and high (i.e., 6-7), which formed a 3 x 3 contingency table of possible responses (see Table 2). Results of this 3 x 3 contingency table suggested significant [$\chi 2$ (4) = 55.57, $p < .01$] asymmetrical differences. Of particular interest, significant ($p < .01$) differences in the proportion of people who fell short, had equal, or exceeded their intentions were present across the strength of intention advocacy. Specific follow-up analysis identified that participants who scored at the scale extremes (i.e. high, low) for intention had a larger proportion of intention – expectation equality than those individuals who scored with less certain advocacy (i.e., neutral intention). Further, of the entire sample, 25% (n =

59) of participants had lower expectations than intentions, 69% (n = 167) had equal intention and expectation, while only 6% (n = 15) of participants had expectations that exceeded their intentions.

Intention and Expectation Differences as a Function of PBC and Intention Commitment

Our next analysis tested the theorizing of Warshaw and Davis (1985) that expectation differs from intention due to greater consideration of perceived temporal fluctuations in motivation and perceived control. For this analysis, all variables were mean-centered, based on the suggestion of Aiken and West (1991) to reduce multicollinearity. Tests for PBC and intention commitment moderation were based on the procedure suggested by Cohen and Cohen (1983) using hierarchical ordinary least squares multiple regression. Further, we tested for a PBC x intention commitment three-way interaction using this hierarchical procedure (Table 3). Results identified that both intention commitment and PBC moderated intention-expectation relations [F_{change} (2) = 11.12; p <.01]. A three-way interaction, however, did not add any additional variance to the equation (p>.05). Interpretation of significant interaction effects used Aiken and West's (1991) suggested procedure of slope analysis. Regression slopes of expectation on intention across PBC and intention commitment levels of low (mean –1 standard deviation), moderate (mean) and high (mean + 1 standard deviation) were used for interpretation. This analysis suggested low intention commitment (r^2 = .66; see Figure 1) and low PBC (r^2 = .71; see Figure 2) marked a divergence of intention and expectation relations in comparison to moderate (PBC r^2 = .88, intention commitment r^2 = .88) and high (PBC r^2 = .94, intention commitment r^2 = .92) levels.

We also examined this PBC and intention commitment moderating analysis using absolute mean levels of intention and expectation for comparison. Aiken and West's (1991) suggested levels of low (mean –1 standard deviation), moderate (mean) and high (mean + 1 standard deviation) were used for creating PBC and intention commitment grouping variables. Next, dependent sample t-tests

were conducted between intention and expectation constructs for low, medium, and high levels of PBC and intention commitment respectively (see Table 4). Values of Cohen's (1988, 1992) effect size *d* were considered the criterion standard for this analysis, given the differences in sample size across groupings. Effect size is more invariant to sample size fluctuation than the traditional p-level criterion. For effect size *d*, < .20 is trivial, .20 is small, .50 is medium, and .80 is large (Cohen, 1988, 1992). Results mirrored the previous regression analysis. Specifically, intention scores were lower for intention in comparison to expectation under conditions of low PBC and intention commitment ($d > .20$), but were no different from expectation under conditions of medium and high PBC and intention commitment ($d < .20$).

Correlational differences between behavioral intention, behavioral expectation, and exercise behavior across low, medium, and high levels of intention commitment and perceived behavioral control were also examined. Dependent sample Hotelling's t-tests for correlations were conducted to compare intention-behavior and expectation-behavior relations generally, and across low, medium, and high levels of PBC and intention commitment respectively (see Table 5). Values of Cohen's (1988, 1992) effect size *q* were considered the criterion standard for this analysis, given the differences in sample size across groupings. For effect size q, < .10 is trivial, .10 is small, .30 is medium, and .50 is large (Cohen, 1988, 1992). Results suggested no meaningful differences were apparent between intention-behavior relations and expectation-behavior relations for the general correlations (i.e. the whole sample) or levels of medium and high intention commitment / PBC. The expectation-behavior correlation was larger than the intention-behavior correlation, however, for conditions of low intention commitment and PBC. Specifically, a small to medium effect size difference ($q = .29$) was observed for low control and a borderline small effect ($q = .10$) was identified for low intention commitment.

A Multivariate Model for Predicting the Expectation-Intention Discrepancy

Finally, we examined potential social cognitive predictors of the expectation-intention discrepancy (i.e., expectation – intention). For this analysis, we utilized structural equation modeling. Structural equation modeling allows for statistical significance tests for the size of each theoretical relation in a model and overall model fit. Our model was estimated with maximum likelihood procedures and assessed using LISREL 8.20 for Windows (Jöreskog & Sörbom, 1997). For specification of the latent concepts, the loading for each concept's first indicator was pre-set to 1.0 in the structural equation model to create a metric scale. The intention-expectation discrepancy construct was modeled as a single indicator concept with no measurement error. Exogenous constructs of attitude, subjective norm, and PBC were freed to correlate as per TPB theory (see Table 1). Further, intention commitment was modeled as a proximal determinant similar to intention in theory of planned behavior structure (Ajzen, 1991). Thus, affective attitude, instrumental attitude, subjective norm, and PBC were modeled with direct effects on the expectation-intention discrepancy and with potential indirect effects on the expectation-intention discrepancy through intention commitment.

The model was a moderately acceptable fit with $\chi^2 = 98.86$ (N = 241, 63) $p < .01$, RMSEA = .05, CFI = .96 (see Hu & Bentler, 1999). Inspection of standardized residuals did not suggest a significantly ($p < .05$) better model fit with simple changes. Table 6 presents the measurement model, and Figure 3 highlights the structural effects. The measurement model was significant ($p< .01$) for all factor loadings and of generally large magnitude (1.00 - .40). In the structural model, intention commitment (standardized effect = .17) and PBC (standardized effect =.28) had significant ($p < .05$) effects on the expectation-intention discrepancy explaining 15% of its variance. Additionally, affective attitude (standardized effect = .33), and PBC (standardized effect = .45) had

significant ($p < .05$) effects on intention commitment explaining 37% of its variance. Of all the TPB constructs, however, only PBC (.35) had a significant ($p < .05$) total effect (i.e., direct effect + indirect effect) on the expectation-intention discrepancy. Thus, affective attitude, instrumental attitude, and subjective norm did not have indirect effects ($p < .05$) on the expectation-intention discrepancy through intention commitment.

Discussion

The objective of our study was to examine the discrepancy between exercise intention and expectation and the potential reasons for this discrepancy. Results of our first analyses focused on whether the extremity of the exercise intention influenced the intention-expectation relationship. Similar to research on attitude extremity and attitude-behavior relations (e.g., Abelson, 1995; Holland, Verplanken & Knippenberg, 2002), we hypothesized that extreme intentions should result in a stronger intention-expectation correspondence than less extreme intentions. This hypothesis was supported by a significant medium effect size (i.e., Cohen, 1992) correlation between exercise intention extremity and the expectation-intention discrepancy. A finer analysis also demonstrated that a larger proportion of exercise intention–expectation equality was evident for respondents who scored on the intention scale extremes (i.e. high, low) in comparison to those individuals who scored with less certain advocacy (i.e., neutral intention). These findings are congruent with the theorizing of Warshaw and Davis (1985) that expectation differs from intention partially due to greater consideration of motivation.

Second, our study was designed to examine the theorizing by Warshaw and Davis (1985) that expectation can differ from intention due to greater consideration of perceived control and anticipated temporal fluctuations in motivation. Moderated regression analysis, moderated mean analysis, differences among correlations, and structural equation modeling converged on similar

findings. Namely, both commitment to the intention and PBC influenced the relationship between exercise intention and expectation. Further, results of the moderation analyses identified that those individuals with low intention commitment and low PBC posses lower exercise expectations than intentions. In contrast, those individuals with medium and high levels of intention commitment and PBC have exercise expectations equal to their intentions. This finding supports the theorizing of Warshaw and Davis (1985) that expectation can include factors such as anticipated fluctuations in the commitment to the intention and PBC interactions over intention.

These results also provided indirect evidence that intention-expectation relations mimic intention-behavior relations, suggesting that expectation may represent a proxy forecast of future behavior. First, both PBC (Ajzen, 1991; Armitage & Conner, 2001) and intention stability (Sheeran & Abraham, 2003) are also key moderators of the intention-behavior relationship. Second, our results demonstrated that intention-expectation deviation occurred from intenders expecting to do less, rather than non-intenders expecting to do more, which mirrors findings from the intention-behavior relationship (Godin, Shephard et al., 1986; Rhodes et al., 2003; Sheeran, 2002). Thus, those individuals with low PBC and commitment to their exercise plans forecast a lower expected behavior than planned.

Warshaw and Davis (1985) also hypothesized that expectation-behavior relations should be larger than intention-behavior relations because expectation takes factors such as perceived behavioral control and anticipated fluctuations in motivation into consideration over intention. Previous research on this issue, however, has been equivocal. Our study demonstrated that expectation-behavior and intention-behavior relations did not differ under conditions of high/medium intention commitment and PBC, but small to medium effects were apparent for expectation-behavior over intention-behavior correlations under low intention commitment and low

PBC conditions. This finding supports the theorizing of Warshaw and Davis (1985), but extends the previous research on intention and expectation relations with behavior by including conditions of intention commitment and PBC. Thus, similar to intention-expectation relations, operational differences between exercise intention and expectation relations with behavior are dependent upon intention commitment and PBC.

Nevertheless, our results demonstrated that differences between exercise intention and expectation are generally small. Our moderated regression (R^2_{change} = .02), mean difference (*d* = .26-.27), and correlation with behavior difference (*q* = .10-.29) analyses displayed small effect sizes while our structural equation model displayed medium (PBC = .35 total effect; intention commitment = .17) effect sizes (Cohen, 1988; 1992) when corrected for the attenuation of measurement error. This evidence certainly suggests why some previous research has dismissed intention and expectation differences. Indeed, our results suggest that exercise intention and expectation are synonymous under conditions of medium to high intention commitment and PBC, and only differ under conditions of low intention commitment and PBC.

Based on these results and the results of previous studies, we recommend that differences between exercise intention and expectation items be taken into account in the future. First, since intention, and not expectation, is the psychological concept most theoreticians are trying to measure, it makes sense to avoid confounding domain representation between intention and expectation when possible. For example, Ajzen (1991) is clearly attempting to capture the measurement of "planned behavior" and its antecedents rather than "expected" or "forecasted" behavior. These latter concepts appear to underlie another measurement domain such as the forecasted PBC x intention interaction. This point has also been made by Sheeran (2002) and Sutton (1998), who argue that expectation may not represent a causal variable in motivational models.

Second, our results suggest that those individuals with low PBC and low intention commitment have marked exercise intention and expectation deviations in inter-correlations and in correlations with behavior. Therefore, the measurement domains of intention and expectation begin to deviate for these individuals and should not be considered interchangeable measures. The correlation between exercise intention and expectation was still very large under low commitment ($r = .81$) and PBC ($r = .84$) conditions, but below standard correlation values for potential unity (i.e., unity $= r > .90$; Cohen & Cohen, 1983). Further, exercise intention-behavior and expectation-behavior relations differed under conditions of low intention commitment and PBC, suggesting marked operational differences with behavior.

Finally, from an applied perspective, examination of the exercise intention-expectation discrepancy, rather than simple aggregation, may elicit a key marker for intention translation difficulties. Our results suggested that exercise PBC was a particularly strong predictor of the expectation-intention deviation. Individuals with large expectation-intention discrepancies may signal the need for PBC interventions during exercise prescription despite strong initial intentions.

Limitations to the preceding study may confine the generalizability of these findings, and therefore justify mentioning. First, the present study uses a convenience sample of primarily female university undergraduates. Our understanding of the generalizability of this issue may benefit from more diverse samples of multiple age groups or clinical populations by strengthening the cross validation of the findings. Second, the study is correlational, and focused on a single behavior (i.e., exercise). Experimental research, and replication of these results with multiple behaviors will improve the overall generalizability and veracity of these findings. Third, the scaling used for the intention and expectation measures generally included scales anchored from “strongly agree” to “strongly disagree.” This is an acceptable scaling method for intention measurement as

demonstrated in previous research (Ajzen, 2002) and the results of our study. Nonetheless, many other scaling anchors for intention and expectation have been utilized in previous research. It is unknown whether the type of scaling anchor used in this study would produce different results when compared to other scaling methods. Finally, our study time-frame of two weeks is relatively short. Other researchers (e.g., Courneya & McAuley, 1994) have suggested that intention and expectation may deviate in measurement even more when longer time frames are taken into consideration by participants. Our results, however, still suggest that intention and expectation deviate even across a projected two-week time-frame.

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Figure Caption

Figure 1. Intention-expectation convergence and divergence across high, medium, and low levels of intention commitment.

Note: levels of low = mean –1 standard deviation, moderate = mean, and high = mean + 1 standard deviation.

Figure 2. Intention-expectation convergence and divergence across high, medium, and low levels of perceived behavioral control.

Note: levels of low = mean –1 standard deviation, moderate = mean, and high = mean + 1 standard deviation.

Figure 3. Theory of Planned Behavior Constructs and Intention Commitment Modeled as Predictors of the Expectation-Intention Discrepancy.

Note: All effects are standardized; ** = $p < .01$, * = $p < .05$.

Table 1.

Means, Standard Deviations, and Correlations for Theory of Planned Behavior Constructs, Expectation, and Intention Commitment (N=241)

	2	3	4	5	6	7	M	SD
1. Affective Attitude	.26**	.15*	.28**	.46**	.45**	.35**	5.18	1.23
2. Instrumental Attitude		.29**	.28**	.31**	.33**	.15*	6.33	0.73
3. Subjective Norm			.23**	.31**	.29*	.15*	4.91	1.32
4. Perceived Control				.45**	.51*	.48**	5.62	1.21
5. Intention					.93**	.49**	4.91	2.17
6. Expectation						.55**	4.64	2.18
7. Intention Commitment							5.26	1.56

Note: ** $p < .01$, *$p < 05$

Table 2.
Frequencies of behavioral intention by behavioral expectation (N = 241).

	Behavioral Expectation				
Behavioral Intention	Fell Short	Equal	Exceeded	$\chi 2$	post-hoc
Low (1-2)	1	38	9	47.38*	Fs<Ex<Eq
% within intention	2%	79%	19%		
% within expectation	2%	23%	60%		
standardized residual	-3.1	0.8	3.5		
Neutral (3-5)	30	24	5	17.32*	Ex<Eq,Fs
% within intention	51%	41%	8%		
% within expectation	51%	14%	33%		
standardized residual	4.1	-2.6	0.7		
High (6-7)	28	105	1	130.40*	Ex<Fs<Eq
% within intention	21%	78%	1%		
% within expectation	48%	63%	7%		
standardized residual	-0.8	1.3	-2.5		
$\chi 2$	26.68*	67.34*	6.40	55.57*	
post-hoc	L<N,H	N,L<H	-		

Note: post-hoc tests at $p < .01$. * = $p < .01$. Ex = exceeded, Fs = fell short, Eq = equal. L = low, N = neutral, H = high.

Table 3.

Regression analysis of the behavioral intention and behavioral expectation / perceived behavioral control interaction (N=241).

Criterion = Expectation	F	df	R	R^2_{change}	β_1	β_2
1. Intention	599.83**	3, 237	.94	.88	.85**	.39**
Intention Commitment					.10**	-.04
PBC					.08*	-.03
2. Intention x Commitment	11.12**	2, 235	.95	.90		.32**
Intention x PBC						.29**
3. Intention x Commitment x PBC	0.32	1, 234	.95	.00		

Note. * = $p < .05$; ** = $p < .01$. df = degrees of freedom. PBC = Perceived Behavioral Control.

Table 4.

Mean differences between behavioral intention and behavioral expectation across low, medium, and high levels of intention commitment and perceived behavioral control.

Construct	Intention	Expectation	t	n	*d*
	Mean (SD)	Mean (SD)			
		Intention Commitment			
Low	3.38 (2.14)	2.85 (1.75)	2.56**	37	.27
Medium	4.87 (1.96)	4.54 (1.97)	5.73**	145	.17
High	5.97 (2.11)	6.00 (2.03)	0.43	59	.01
		Perceived Behavioral Control			
Low	3.62 (2.19)	3.08 (2.00)	2.71**	37	.26
Medium	4.85 (2.11)	4.59 (2.08)	4.49**	162	.12
High	6.27 (1.57)	6.21 (1.59)	0.96	42	.04

Note: ** = p<.01; t = student's t for dependent samples; *d* = Cohen's (1992) effect size *d*. Levels of low = mean –1 standard deviation, moderate = mean, and high = mean + 1 standard deviation.

Table 5.

Correlation differences between behavioral intention, behavioral expectation, and exercise behavior across low, medium, and high levels of intention commitment and perceived behavioral control.

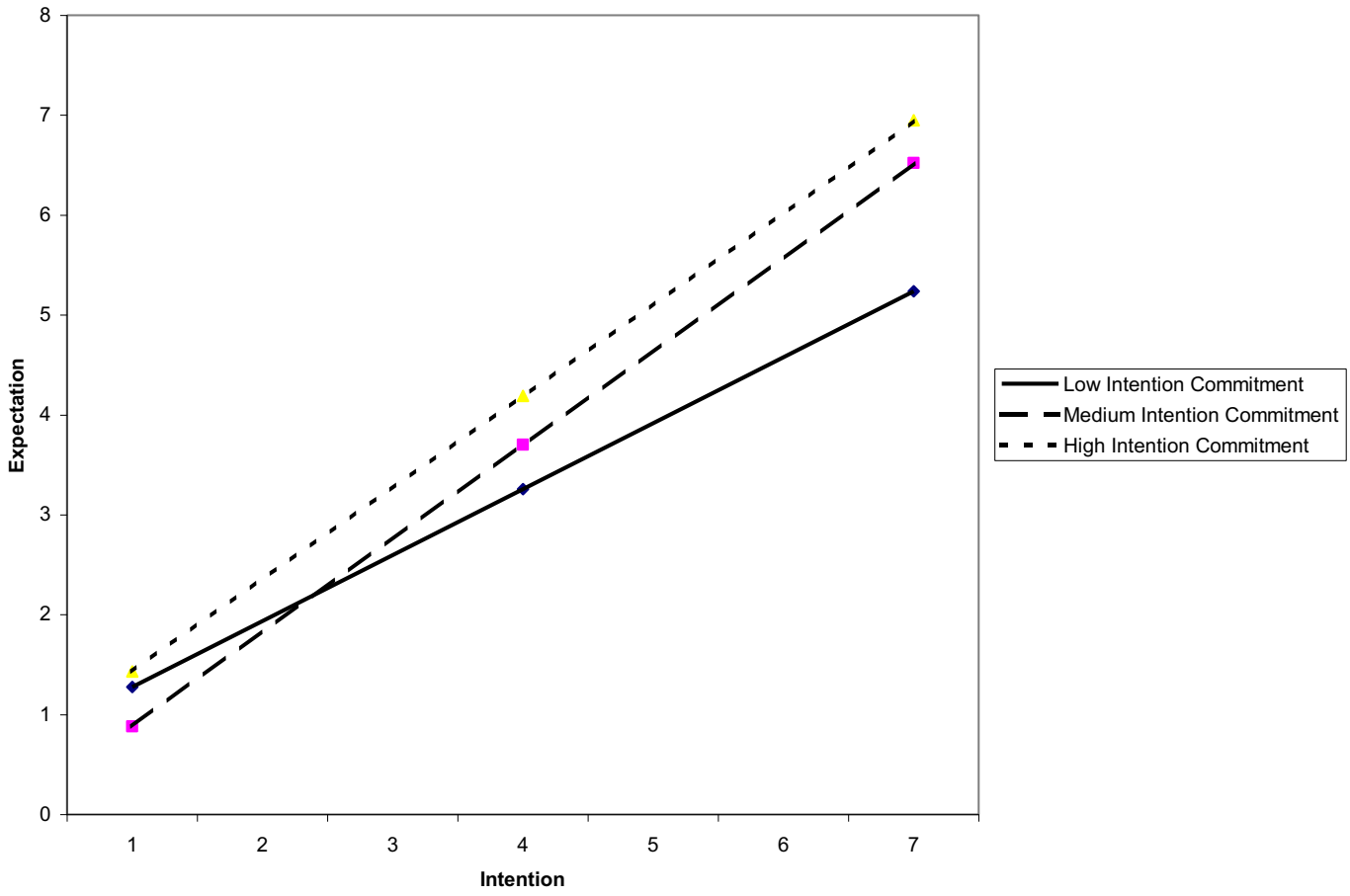
Construct	Intention-Behavior	Expectation-Behavior	t	n	*q*
	r	r			
	.52**	.55**	1.44	241	.04
Intention Commitment					
Low	.25*	.34*	1.01	37	.10
Medium	.48**	.48**	0.00	145	.00
High	.41*	.38**	0.79	59	.04
Perceived Behavioral Control					
Low	.36*	.58**	3.93**	37	.29
Medium	.48**	.46**	0.79	162	.02
High	.46**	.50**	1.57	42	.05

Note: * = p < .05, ** = p < .01; t = Hotelling's t for dependent correlations; *q* = Cohen's (1992) effect size *q*. Levels of low = mean –1 standard deviation, moderate = mean, and high = mean + 1 standard deviation.

Table 6.
Factor loadings of theory of planned behavior constructs.

	Factor Loading	Error Variance
Affective Attitude		
unenjoyable-enjoyable	.67	.55
unpleasant-pleasant	.90*	.18
boring-interesting	.68*	.54
Instrumental Attitude		
useless-useful	.58	.67
foolish-wise	.78*	.40
harmful-beneficial	.80*	.36
Subjective Norm		
injunctive norm 1	.75	.44
injunctive norm 2	.82*	.33
descriptive norm	.49*	.76
Perceived Behavioral Control		
PBC1	.77	.40
PBC2	.70*	.51
Intention Commitment		
INT1	.88	.22
INT2	.75*	.44
Expectation-Intention Discrepancy	1.00	.00

Note: All loadings reported are standardized. No t-values are available for the first loading because it was fixed for model identification purposes. * = $p < .01$.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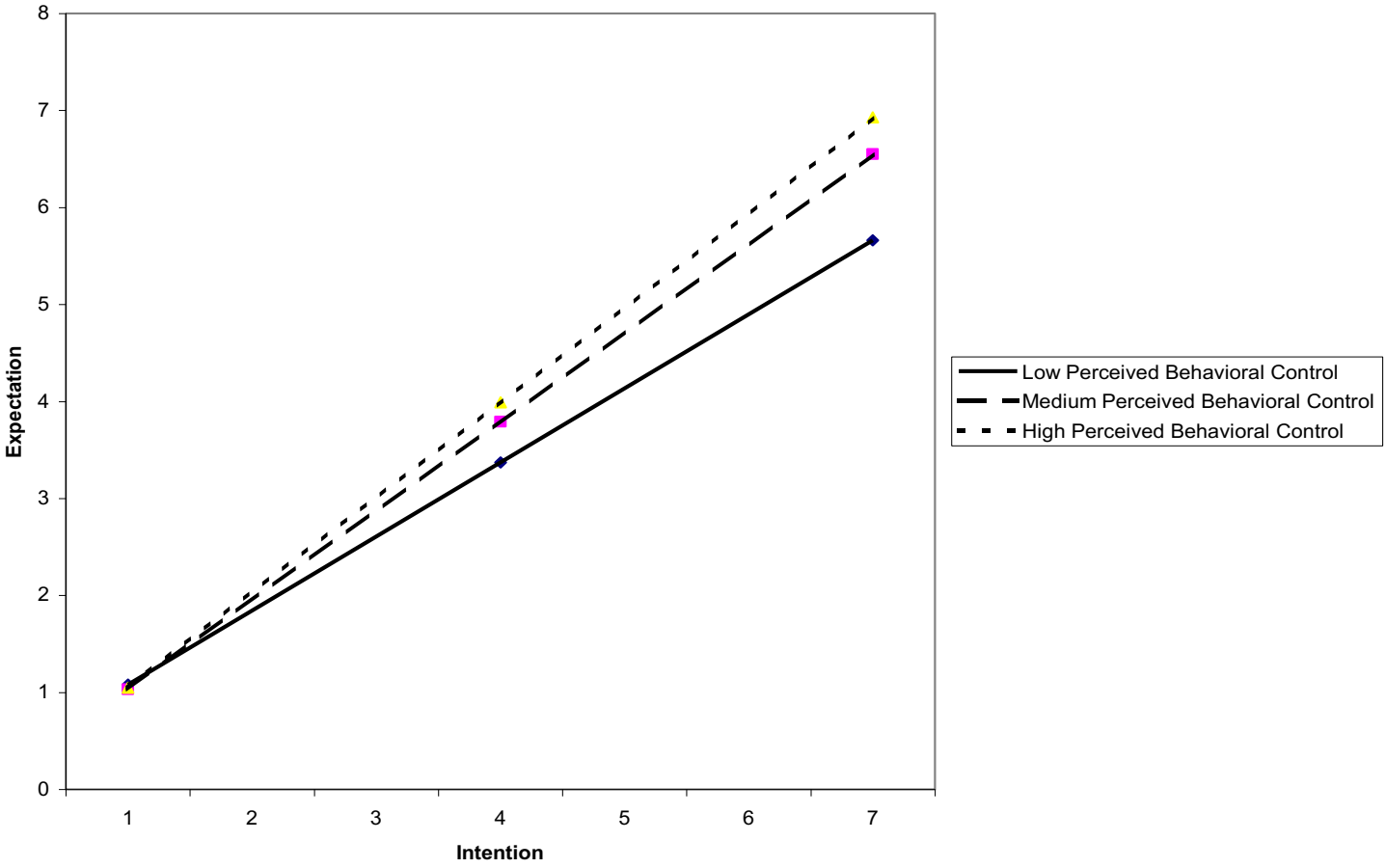
High Intention Commitment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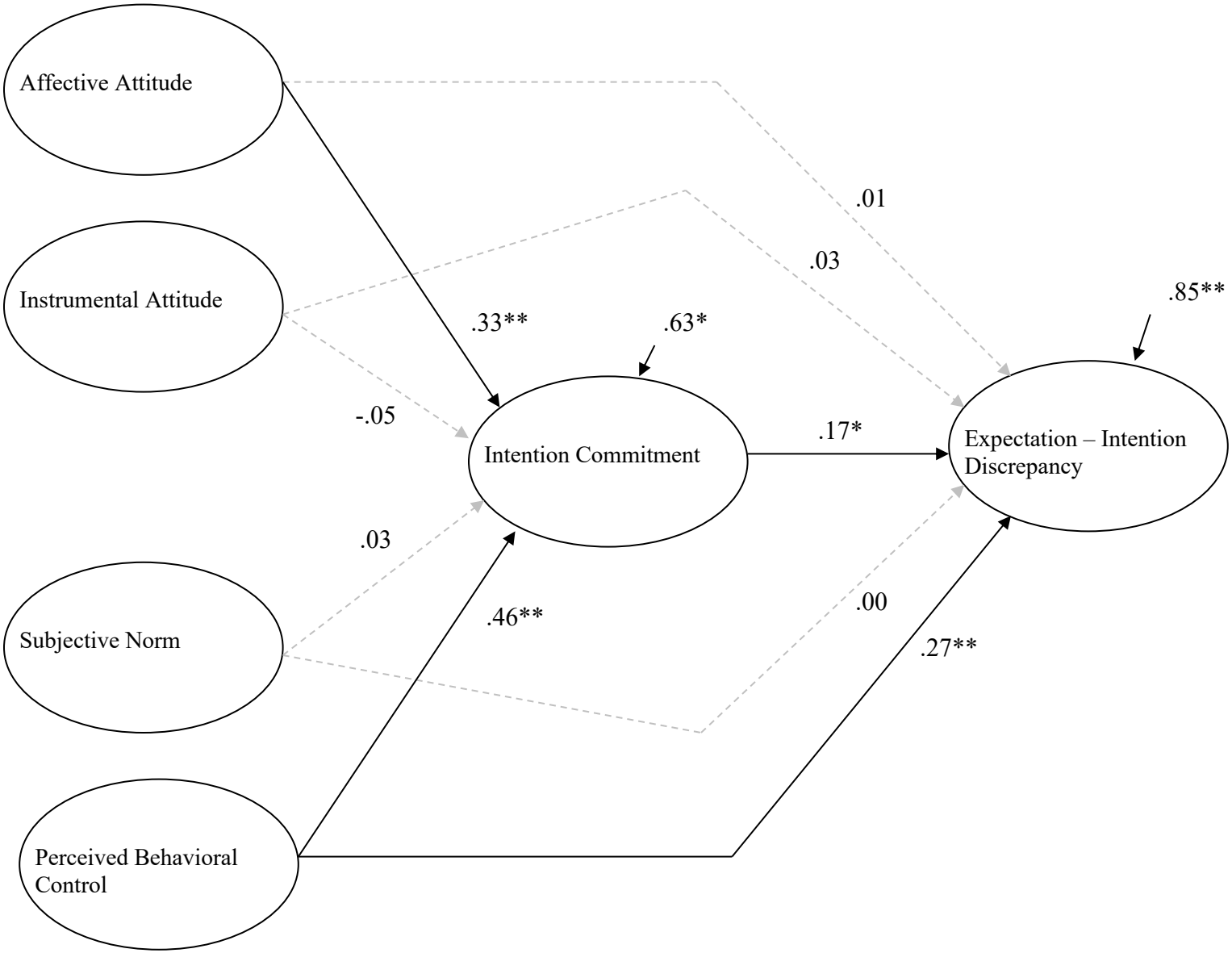
Affective Attitude
Instrumental Attitude
Subjective Norm
Perceived Behavioral Control
Intention Commitment
Expectation – Intention Discrepancy
.33**
.63*
.85**
.01
.03
-.05
.17*
.03
.46**
.00
.27**