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What do Confidence Items Measure in the Physical Activity Domain?

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Abstract

The purpose of this study was to examine the measurement domain of confidence items commonly used in physical activity research. We hypothesized that confidence items that included a phrase to hold motivation constant would differ from standard confidence items. We also hypothesized that the elicited reasons why participants believed they were confident would provide evidence for measurement breadth. Participants were 248 undergraduate students who completed confidence items, a thought listing procedure, and a two-week self-report of physical activity. Results showed that confidence items with motivation held constant loaded exclusively on one factor but standard confidence items were factor complex with intention. Correlations with physical activity intention and behavior were larger for confidence items than confidence items with motivation held constant. Finally, the thought listing procedure identified that three of the seven reasons for answering confidence items, most notably motivation, were outside the intended measurement domain of self-efficacy.

Regular exercise and physical activity is associated with a significant decline in all-cause mortality and reductions in numerous chronic disease states such as cardiovascular disease, cancer, and type 2 diabetes mellitus (Health-Canada, 2002; USDHHS, 1996). Despite these impressive benefits, recent health statistics indicate that a majority of individuals in many developed countries are insufficiently active to realize these health benefits (CFLRI, 2002; USDHHS, 1996). Therefore, the need to understand physical activity behavior and implement effective intervention strategies is paramount.

Arguably, the most consistent correlate of physical activity behavior is self-efficacy (Troost, Owen, Bauman, Sallis, & Brown, 2002). The self-efficacy construct was created for Bandura's (1998) social cognitive theory, but it has since been included in almost all popular social cognition theories such as the theory of planned behavior (Ajzen, 2002b), the transtheoretical model of behavior change (Prochaska & Velicer, 1997), and protection motivation theory (Rogers, 1983). Indeed, a self-efficacy or control type construct is considered an essential antecedent of motivation and behavior by many leading health behavior theorists (Fishbein et al., 2001). Bandura (1998) defines self-efficacy as one's capability to organize and execute the courses of action required to produce given levels of attainments and theorizes that it operationally influences one's motivation, thought processes, incentives, and outcome expectations.

Though self-efficacy is a well established correlate of physical activity, few studies have detailed its measurement domain (Maibach & Murphy, 1995). Sound measurement is the foundation for the validity of research findings (Messick, 1995). Thus, in health behavior domains like physical activity, sound and precise measures of constructs are paramount when attempting to translate findings into actual promotion practice. Further, redundancies in the

measurement domains of full psychological models can confound theory (Bandura, 1998), and empirical results (Rhodes & Courneya, 2004). Though Bandura's (1998) above noted definition of self-efficacy includes a remarkably broad measurement domain, its operational definition and causal structure illuminate its measurement domain boundaries (Bandura, 1998). For example, self-efficacy is hypothesized as an antecedent of outcome expectations, motivation, and incentives (Bandura, 1998). Moreover, Bandura (1997) assumes that motivation and incentives (affective and instrumental) are present when people make efficacy judgments. Thus, self-efficacy measures should 1) demonstrate factor distinction from these constructs, and 2) should not be a result of these factors.

Although self-efficacy is measured in different ways (e.g., McAuley, 2002; Sallis, Pinski, & Grossman, 1988), the most common form of measurement includes ratings of confidence (Maibach & Murphy, 1995). For example, when used in the transtheoretical model, self-efficacy is measured by rating confidence to overcome common physical activity barriers (Marcus, Selby, Niaura, & Rossi, 1992; Plotnikoff, Hotz, Birkett, & Courneya, 2001). This self-efficacy construction, often called barrier efficacy, is used with great frequency in physical activity research (McAuley & Mihalko, 1998). Rhodes and Courneya (2003; 2004), however, have demonstrated that confidence items at least partially measure motivation independent from control. These studies were based on the theory of planned behavior and its perceived behavioral control construct, but their theorizing for this measurement confound was based on Bandura's (1998) self-efficacy construct. Furthermore, Rhodes and Courneya (2003; 2004) argued that the measurement confound was likely to extend to other social cognitive models that use confidence items.

Rhodes and Courneya (2003; 2004) theorize that participants construe confidence items broadly and often beyond the scope of its intended measurement domain when these items are used to measure self-efficacy. For example, some participants may have complete capability over executing regular physical activity, but report they are not confident they could be physically active because they lack motivation to do so. Thus, the measurement domain of the confidence item extends into the assessment of motivation independent of self-efficacy. Since self-efficacy is theorized as a proximal cause of motivation, measures of self-efficacy should not act as measures of motivation itself. This would add to the unwanted construct redundancy Bandura (1998) suggests researchers need to avoid. Rhodes and Courneya (2003; 2004) subsequently demonstrated that when a phrase is used in the confidence item that holds motivation to a positive constant (e.g., if I wanted to), the measurement complexity with summary motivation (i.e., intention) is lessened. This approach is within the theoretical tenets of self-efficacy theory (Bandura, 1997), since motivation is supposed to be present when people make efficacy judgments.

Still, these findings were based on a general confidence item used in the TPB to measure perceived behavioral control. No evidence presently exists to suggest that this finding extends to confidence items used in more standard self-efficacy measurement (i.e., confidence to overcome specific barriers). Further, no inductive research has been performed on confidence items to evaluate what participants draw upon when answering such items. An understanding of this issue should help illuminate the antecedents of confidence items, and provide a tentative test as to whether or not participants use motivation, affect, incentives, and outcome expectation to form efficacy appraisals.

The purpose of this paper, therefore, was to extend the empirical findings of Rhodes and Courneya (2003; 2004) beyond the scope of the theory of planned behavior and to elaborate our understanding of the measurement domain of confidence items using quantitative and qualitative and methodology. First, we attempted to replicate the findings of Rhodes and Courneya (2003; 2004) using prototypical self-efficacy items phrased in terms of confidence to engage in regular physical activity despite common barriers. We hypothesized that confidence items that included a phrase to hold motivation constant would differ in their measurement domain from typical confidence items that do not hold motivation constant. Specifically, we hypothesized that confidence items would show factor complexity with intention, while confidence items with motivation held constant would not. We further hypothesized that because confidence items partially measure motivation, mean levels of confidence items would be lower than confidence items with motivation held constant. This hypothesis is based on the assumption that the broader measurement domain of confidence items would include the weighing of additional factors such as motivation in comparison to confidence items where motivation is held constant. The additional consideration of these factors should lower overall confidence because even more antecedents need to be considered. Based on this theorizing, we also hypothesized that correlations with physical activity intention and behavior would be larger for confidence items than confidence items with motivation held constant. Intention was considered our measure of summary motivation, based on its use in almost all social cognition models (Bandura, 1998; Fishbein et al., 2001).

Finally, as a secondary research question, we sought to elicit why participants believed they were confident (or not) they could overcome barriers to participate in regular physical activity. We hypothesized that the reasons given would provide evidence towards the measurement

breadth of confidence items and the antecedents participants draw from when answering these items. We specifically hypothesized that, counter to Bandura's (1998) operational structure for self-efficacy, participants would draw upon motivation, incentives, and outcome expectations when answering confidence items.

Method

Participants and Procedure

Two hundred and forty-eight students participated in this study for extra credit in their introductory psychology and health psychology courses. The participants attended large group sessions during February and March 2003, completing self-report measures of self-efficacy, intention, an open-ended thought listing item, and a two-week follow-up of physical activity behavior. The mean age of participants was 21.61 (SD = 4.21) years, 74% were female, and the mean year in university for the sample was 2.98 (SD = 0.91).

Instruments

Regular physical activity was defined for all participants as accumulating at least 30 minutes of activity of at least at a moderate intensity on at least four or more days of the week. This definition was chosen to reflect Health Canada's position stand for recommended weekly physical activity among adults (Health-Canada, 2002). Participants were asked to use this definition when answering all questions. The format of the questionnaire was randomized so that the intention measure and the self-efficacy measures (with and without motivation held constant) appeared in different orders. Specifically, participants had an equal chance of receiving one of any three possible questionnaires distributed with different ordering of these measures. This was performed in an attempt to counter any error that may occur from ordering effects. Previous research has demonstrated that the order of questions may influence responses (e.g.,

Budd, 1987; Budd & Spencer, 1986; Strack, Schwarz, & Waenke, 1991). The open-ended thought listing question (described below), however, always followed the self-efficacy measure where confidence items did not include a phrase to hold motivation as a positive constant. This is because our interest in this secondary analysis was to elicit the reasons why participants respond to standard confidence items.

Self-efficacy towards regular physical activity was measured using items from Plotnikoff et al. (2001) and further validated in the physical activity domain by Rhodes, Plotnikoff, and Spence (2004). The items were originally created from Marcus and colleagues' (1992) existing self-efficacy measure for a Canadian population. Self-efficacy was assessed with seven-point rating scales, ranging from 1 (extremely unconfident) to 7 (extremely confident). The items assessed perceived confidence for doing regular physical activity over the next two weeks when one: is tired, in a bad mood, has to do it by one's self, finds it boring, has other demands on one's time, and perceives the weather to be poor. The self-efficacy measure that held motivation constant used exactly the same items, but included the phrase "if I really wanted to" before the initial confidence statement. Internal consistency was high for both the self-efficacy measure where motivation was not held constant ($\alpha = .90$) and the self-efficacy measure where motivation was held constant ($\alpha = .88$).

The thought listing measure included the statement "considering your answers on the last six questions, please list the main reasons why you are generally confident or unconfident you can overcome these barriers and engage in regular physical activity over the next two weeks....." Seven short open lines followed this statement, so that participants could express their views. This follows similar guidelines to general thought listing methodology (e.g., Petty & Cacioppo, 1986). Specifically, the thoughts listed were coded under basic themes, and then sub-coded as

either positive or negative reasons. These data were coded as total counts per theme (Petty & Cacioppo, 1986). A judge was trained for both the coding of the valence of these thoughts (positive and negative), and the potential themes. A second judge, the principal investigator, then coded the data in a random order. The interjudge reliabilities were .84 for themes and 1.00 for valence. Judges met to come to a common conclusion where there were discrepancies.

Physical activity intention was assessed by three items following the scaling recommended by Ajzen (2002a). The first two items were answered using 7-point scales ranging from 1 (strongly disagree) to 7 (strongly agree). The two items were: 1) “I plan to engage in regular physical activity over the next 2 weeks,” and 2) “I intend to engage in regular physical activity over the next 2 weeks.” The third item was an open scaled item recommended by Courneya (1994): “Over the next 2 weeks, I intend to engage in regular physical activity ___ times per week.” Internal consistency for the measure was high ($\alpha = .93$)

Physical activity behavior was measured using an adapted 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. Our adaptation included substituting “physical activity” for “exercise” and “two weeks” for “one week”. Strenuous and moderate physical activity frequencies were aggregated to produce a total activity frequency at or above moderate intensity. Mild activity was not included as an indicator due to its incongruence with our definition of regular physical activity.

Results

Comparing Confidence Items With and Without Motivation as a Positive Constant

Our first examination of confidence items with and without motivation held constant explored the factor structure of these items and tested for factor complexity with intention items. For this procedure, we used a standard exploratory factor analysis with principal components extraction. Since we expected the confidence items and intention items to be correlated with one another, oblique rotation was utilized to interpret the analysis. Results of this analysis are presented in Table 1. This analysis identified a two-factor solution (factor 1 eigenvalue = 7.86; factor 2 eigenvalue = 1.83). Confidence items with motivation held as a positive constant loaded exclusively on one factor (explained variance = 52%) and intention items loaded exclusively on the second factor (explained variance = 12%). These loadings were of considerable effect size for both factors (.65 - .95). Standard confidence items, however, loaded on both the intention and confidence when motivation is held constant factors. Due to their factor complexity, these items had smaller loadings on both the intention (.37 - .54) and confidence with motivation held constant (.29 - .49) factors.

For an additional assessment of measurement structure, we also examined differences between standard confidence items and confidence items with motivation held constant using absolute mean levels for comparison. Dependent sample t-tests and values of Cohen's (1992) effect size d were considered the criterion standard for this analysis. P-levels were set at a more conservative .01 level in order to provide some experiment-wise error protection. For effect size d , $< .20$ is trivial, $.20$ is small, $.50$ is medium, and $.80$ is large (Cohen, 1992). Results demonstrated that means were systematically larger for confidence items when motivation was

held constant in comparison to standard confidence items (see Table 2). Furthermore, the effect size difference was consistently within the medium range.

Finally, we tested the operational difference between confidence items by examining correlations with intention and behavior outcomes. Dependent sample Hotelling's *t*-tests for dependent correlations were conducted to compare 1) standard confidence items and confidence items when motivation is held constant and intention relations, and 2) standard confidence items and confidence items when motivation is held constant and behavior relations (see Table 3). Similar to the previous analysis, *p*-levels were set at a more conservative .01 level in order to provide some experiment-wise error protection. Values of Cohen's (1992) effect size *q* were considered an additional criterion standard for this analysis. For effect size *q*, < .10 is trivial, .10 is small, .30 is medium, and .50 is large (Cohen, 1992). With the possible exception of confidence to overcome bad weather, the results suggested that standard confidence items had larger correlations with intention than confidence items when motivation is held constant ($p < .01$). Effect size differences were small to borderline-medium. Confidence to overcome bad weather did not have a significant correlation difference between the two types of confidence items and intention, but the difference did meet the small effect size criterion.

Three of the six confidence items (social support, fatigue, time), and the aggregate, showed that standard confidence items had larger correlations with behavior than confidence items when motivation is held constant ($p < .01$). Effect sizes for meaningful differences were small. Confidence to overcome a bad mood did not have a significant correlation difference between the two types of confidence items and behavior, but the difference did meet the small effect size criterion.

Reasons Why Participants Were or Were Not Confident

Results of the thought listing procedure for the reasons individuals felt confident (or not) identified seven themes. These themes were: improved health (30% endorsed), motivation (37% endorsed), habit (22% endorsed), enjoyment issues (19% endorsed), time issues (48% endorsed), social support issues (32% endorsed), and energy issues (15%). With the exception of improved health, whereby endorsement was unanimously positive, motivation (facilitator = 22% endorsed; barrier = 15% endorsed), enjoyment issues (facilitator = 16% endorsed; barrier = 3% endorsed), time issues (facilitator = 9% endorsed; barrier = 39% endorsed), social support issues (facilitator = 25% endorsed; barrier = 7% endorsed), energy issues (facilitator = 1% endorsed; barrier = 14% endorsed), and habit (facilitator = 20% endorsed; barrier = 2% endorsed) were all endorsed as possible positive facilitators or negative barriers. Finally, of these themes, three (time issues, social support issues, energy issues) clearly fall under the antecedent measurement domain of self-efficacy as outlined by Bandura (1997; 1998). Habit may partially fall under self-efficacy's self-regulatory domain, while three of these themes arguable fall under measurement domains outside the construct of self-efficacy such as motivation, and outcome expectations (improved health, enjoyment).

Discussion

Confidence items are often used to measure self-efficacy in physical activity research. Recent research, however, has provided evidence that confidence questions may extend into the measurement domain of motivation, independent of control (Rhodes & Courneya, 2003, 2004). The purpose of this paper was to examine the measurement domain of confidence items commonly used in physical activity research to measure self-efficacy.

The first purpose of this study was to examine whether measures that include a phrase that attempts to hold motivation constant when participants respond to confidence items deviates

from standard confidence items. Motivation and incentives are supposed to be assumed when people make efficacy appraisals (Bandura, 1997), but Rhodes and Courneya (2003; 2004) have demonstrated that general confidence items often assess motivation unless a phrase to discount motivation is present. These findings have been limited to the perceived behavioral control construct of the theory of planned behavior, but we hypothesized that the finding could be extended to confidence items typically used to measure self-efficacy. Specifically, we hypothesized that confidence items would show factor complexity with intention, while confidence items with motivation held constant would not. We further hypothesized that because confidence items extend into the measurement domain of motivation, mean levels of confidence items would be lower than confidence items with motivation held constant; and correlations with physical activity intention and behavior would be larger for confidence items than confidence items with motivation held constant.

Results generally supported our hypotheses. Confidence items showed factor complexity with intention, while confidence items with motivation held constant did not. Factor loadings for the confidence items were quite evenly split between intention and confidence when motivation was held constant. This suggests that confidence items may partially measure motivation unless a phrase is used to hold motivation constant. Differences between the absolute mean values of confidence and confidence when motivation was held constant were also present, with confidence items possessing lower means. Effect sizes for this difference were medium, suggesting a marked difference between measures. The results suggest that the measurement domain of confidence items narrows when motivation is held constant. This is in agreement with the original theorizing by Rhodes and Courneya (2003; 2004), who suggested that confidence items may have an extended measurement domain beyond control and into motivation. The

additional antecedents and extended measurement domain of confidence items forces participants to consider a wider range of factors, thus lowering confidence judgments compared to confidence items when motivation is held constant.

Good measurement is a foundation for the outcomes and relations sought in physical activity research. Thus, the partial confound between standard confidence items and intention is problematic. This was particularly noticeable in the difference between 1) intention-confidence, and 2) intention-confidence when motivation was held constant correlations. Because confidence items partially measure intention, their correlations with intention were systematically larger than the correlations between intention and confidence items when motivation was held constant. Furthermore, the effect size difference was close to medium ($\Delta r = .30$). This suggests that measurement redundancy between confidence items and intention items may bias their correlation upwards. This problem causes obvious interpretational error, but also may affect the relations of other variables with intention. For example, Rhodes and Courneya (2004) showed that control items when motivation was not held constant trivialized the partial correlations of affective attitude and subjective norm when compared to control items that held motivation constant. A similar finding may extend to the constructs other than self-efficacy in other social cognition theories.

Unfortunately, this bias appears to extend beyond intention correlations and into behavior correlations as well. Although the effect size differences were reduced from the findings with intention, the extended measurement domain of confidence items biased correlations with behavior when compared to confidence items when motivation is held constant. Five of seven tests showed small effect size differences between behavior correlations with confidence items and with confidence items once motivation is held constant. This suggests that the differences

are meaningful. Most notably, the aggregate confidence construct, which is used to measure self-efficacy, had a significantly larger correlation with behavior than the aggregate confidence items when motivation is held constant. This suggests that, similar to intention, standard confidence items may bias behavior correlations upwards because of a measurement domain that extends into motivation.

It is important to note that the use of confidence items that hold motivation constant still resulted in strong correlations with physical activity intention and behavior. Indeed, using these items to represent self-efficacy resulted in a medium-to-large effect with intention and a medium effect with physical activity using Cohen's effect size r criterion (Cohen, 1992). This is in agreement with previous research showing a strong association of self-efficacy with physical activity (Troost et al., 2002), and demonstrates the importance of self-efficacy to physical activity behavior even when potential confounds with motivation are controlled for.

As a secondary analysis of the measurement domain of confidence items, we elicited why participants believed they were confident (or not) they could overcome barriers to participate in regular physical activity using a qualitative thought listing procedure. We hypothesized that the reasons given would provide evidence towards the measurement breadth of confidence items and the antecedents participants draw from when answering these items. We specifically hypothesized that, counter to Bandura's (1998) operational structure for self-efficacy, some participants would draw upon motivation, incentives, and outcome expectations when answering confidence items. Our results provided some evidence to support our hypothesis. Most notably, one third of the sample cited motivation as an antecedent reason for responding to the confidence items. Since motivation is a) assumed to be present when making efficacy judgments, and b) theorized as a consequence of self-efficacy (Bandura, 1997, 1998), its elicitation as a reason for

confidence is problematic. Indeed, this result compliments our quantitative findings and suggests that motivation is not constant when some participants are making confidence judgments.

Further, this finding suggests that motivation may be an antecedent of confidence.

Similar to this finding, 30% of participants responded that they are confident they can engage in regular physical activity because it is good for their health and 19% of respondents cited enjoyment issues as reasons for confidence. These results again suggest that incentives, and outcome expectations (affective and instrumental) are not constant when participants answer confidence items and that these factors may be the reason for such judgments. This is problematic because, like motivation, self-efficacy is theorized as a cause of these constructs (not an effect), and supposed to be independent in its measurement domain (Bandura, 1997, 1998).

Still, four of the seven themes identified in the thought listing procedure appear to fall under the theorized measurement domain of self-efficacy. Time issues were the most frequently cited reason for confidence (48%) which is in agreement with previous research (e.g., CFLRI, 2002). Energy and social support issues also fall under self-efficacy's antecedents and measurement domain (Bandura, 1998) and habit (22%) could arguably fall under self-efficacy's measurement domain to the extent that it represents one's organizational and self-regulatory capability. Thus, the thought listing procedure suggests that confidence items do include the intended measurement domain and antecedents of self-efficacy, but these items may also extend the boundaries of this measurement domain into motivation and outcome expectation/incentive.

Based on these findings and previous research on the topic (Rhodes & Courneya, 2003, 2004), it is recommended that confidence items include phrases that attempt to hold motivation constant when used to measure self-efficacy. Still, motivation itself is a domain that is unlikely to be adequately measured, and thus held constant, with the use of a single phrase. Further,

affective and instrumental outcome expectations, which were also reasons for responding to confidence items, may not be adequately held constant with a single phrase. Therefore, measures of self-efficacy that use other items less confounded with these factors may be a prudent alternative course of action. Items that use ease-difficulty, ability, and capability are not recommended as alternatives to confidence items, because these terms also appear to extend into the motivational domain (Rhodes & Courneya, 2003, 2004).

Some limitations of the present study warrant mention. First, the present study used a convenience sample of primarily female university undergraduates and self-reported physical activity behavior. The veracity of this line of research would benefit by using more objective measures of physical activity (e.g., attendance to a fitness facility) and diverse samples of multiple age groups or clinical populations to strengthen the cross validation of the findings. Second, the likert-type scaling for confidence items is used frequently in the physical activity domain but other types of scaling have also been recommended (Bandura, 1997; McAuley & Mihalko, 1998). Although this study has focused on the item phrasing, differences in scaling may also affect the results. Third, the thought listing procedure added interesting information about the types of reasons for responding to confidence items, but some of the responses were circular. For example, time, energy, and social support were barriers included in the items themselves. This may be a positive reflection that responses were based on the intended measurement domain, but it also may suggest that participants were just parroting the items. In either case, extending the methodology to focus groups and/or individual processes analysis (i.e., running commentary during item responses) would improve the validity of these results. Finally, the results may differ when behaviors other than physical activity are used. The generalizability of these findings would benefit from including multiple behavioral domains.

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Table 1

Principal components analysis of standard confidence items, confidence items when motivation is held constant, and intention items (oblique rotation)

| Items | Factor 1 | Factor 2 |
|--|----------|----------|
| “plan” | -.08 | .95 |
| “intend” | -.08 | .93 |
| “intend (open scaled)” | -.14 | .90 |
| “social support” | .44 | .37 |
| “fatigue” | .47 | .51 |
| “bad mood” | .44 | .48 |
| “boredom” | .49 | .47 |
| “limited time” | .31 | .54 |
| “bad weather” | .29 | .53 |
| “social support (motivation constant)” | .67 | .03 |
| “fatigue (motivation constant)” | .92 | -.11 |
| “bad mood (motivation constant)” | .87 | -.04 |
| “boredom (motivation constant)” | .89 | -.08 |
| “limited time (motivation constant)” | .75 | -.02 |
| “bad weather (motivation constant)” | .65 | .12 |
| Proportion of variance (%) | 52.52 | 11.88 |

Table 2

Mean differences between standard confidence items and confidence items when motivation is held constant (N = 248)

| Construct | Standard | Motivation Constant | t | d |
|----------------|-------------|------------------------|--------|-----|
| | Mean (SD) | Mean (SD) | | |
| aggregate | 4.68 (1.47) | 5.58 (1.09) | 13.16* | .70 |
| social support | 5.70 (1.62) | 6.31 (0.96) | 8.46* | .47 |
| fatigue | 4.36 (1.73) | 5.40 (1.43) | 11.65* | .66 |
| bad mood | 5.10 (1.78) | 5.87 (1.23) | 9.06* | .51 |
| boredom | 4.49 (1.75) | 5.50 (1.28) | 11.73* | .66 |
| limited time | 3.54 (1.95) | 4.63 (1.85) | 10.62* | .57 |
| bad weather | 4.90 (1.91) | 5.78 (1.37) | 10.14* | .54 |

Note: * = $p < .01$; t = student's t for dependent samples; d = Cohen's (1992) effect size d.

Table 3

Correlation differences between standard confidence items and confidence items when motivation is held constant with exercise intention and behavior

| | Standard-Intention | Motivation -Intention Constant | t | q | Standard-Behaviour | Motivation -Behaviour Constant | t | q |
|----------------|--------------------|-----------------------------------|-------|-----|--------------------|-----------------------------------|-------|-----|
| | r | r | | | r | r | | |
| aggregate | .63* | .43* | 5.17* | .28 | .47* | .33* | 3.19* | .17 |
| social support | .49* | .35* | 3.39* | .17 | .35* | .23* | 2.70* | .14 |
| fatigue | .58* | .35* | 5.06* | .29 | .45* | .27* | 3.59* | .21 |
| bad mood | .55* | .36* | 4.34* | .24 | .40* | .30* | 2.08 | .11 |
| boredom | .53* | .34* | 4.16* | .24 | .36* | .29* | 1.39 | .08 |
| limited time | .51* | .32* | 4.06* | .23 | .35* | .21* | 2.75* | .16 |
| bad weather | .47* | .38* | 2.05 | .11 | .41* | .36* | 1.10 | .06 |

Note: * = $p < .01$; t = Hotelling's t for dependent correlations; q = Cohen's (1992) effect size q.