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Running head: DEFENSIVE PESSIMISM AND SELF-HANDICAPPING

Testing a Model of Antecedents and Consequences of Defensive Pessimism and Self-
Handicapping in School Physical Education

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Abstract

There has been very limited research on the use of self-worth protection strategies in the achievement context of school physical education (PE). Thus, this study aimed to examine some antecedents and consequences of defensive pessimism and self-handicapping. The sample comprised 534 (females $n = 275$; males $n = 259$) British pupils recruited from two schools who responded to established questionnaires. Results of structural equation modelling analysis indicated that self-handicapping and defensive pessimism were positively predicted by fear of failure and negatively predicted by competence valuation. In addition, defensive pessimism was negatively predicted by physical self-concept. In turn, defensive pessimism negatively predicted enjoyment in PE and intentions to participate in future optional PE programs. Self-handicapping did not predict enjoyment or intentions. Results from multi-sample structural equation modelling showed the specified model to be largely invariant across males and females. The findings indicate that although both strategies aim to protect one's self-worth, some of their antecedents and consequences in PE may differ.

School Physical Education (PE) is a context in which real or perceived evaluative threats to self-worth (i.e., one's sense of value and belonging in a given context; Covington, 2000) can be particularly salient for some pupils because they are often required to publicly demonstrate their physical and sporting abilities. Pupils faced with such evaluative threats may use various strategies to protect their self-worth. Self-handicapping and defensive pessimism are two such strategies that have received recent research attention (e.g., Elliot & Church, 2003; Martin, Marsh, Williamson, & Debus, 2003). In the present work, we sought to examine a theoretical model that embraces a number of potential antecedents of self-handicapping and defensive pessimism (i.e., fear of failure, physical self-concept, and competence valuation), as well as two important outcomes of these strategies (viz., future intentions to partake in optional PE and enjoyment in PE). The relationships among the potential antecedents and the two cognitive strategies have generally been examined in isolation, if at all, rather than in a combined theoretical model. Further, such research has often been conducted in contexts such as school classrooms (e.g., Urdan, Midgley, & Anderman, 1998) or experimental settings (e.g., Berglas & Jones, 1978). Surprisingly, there have been very few studies pertaining to self-handicapping in PE (e.g., Standage, Treasure, Hooper, & Kuczka, 2007), and virtually no research on defensive pessimism. Further, no PE-based research has examined the two self-protection strategies collectively, in terms of their antecedents and consequences.

Self-handicapping is an attribution-related strategy defined as “any action or choice of performance setting that enhances the opportunity to externalize (or excuse) failure and to internalize (reasonably accept credit for) success” (Berglas & Jones, 1978,

p. 406). Specifically, self-handicappers aim to protect self-worth via the creation of real or claimed impediments (e.g., illness, lack of practice, or procrastination) that serve as plausible explanations for performance failure (Elliot & Church, 2003). For example, a pupil may claim to feel unwell prior to participation in a PE task, so that he/she will be able to attribute any subsequent poor performance to this illness, thus protecting his/her self-worth. Moreover, if the pupil is successful at the task, he/she can claim to have been successful despite the illness, thus attempting to enhance his/her self-worth and image.

Self-handicapping strategies can be subdivided into *behavioural* or *self-reported* forms (Leary & Shepperd, 1986). Behavioural self-handicaps are genuine obstacles that have been wilfully created by an individual to restrict his/her performance. An example would be a pupil who deliberately does not warm up adequately before a skills test in PE. Self-reported self-handicaps refer to verbalized excuses for poor performance that are declared before or during performance. Unlike behavioural self-handicaps, these self-reported handicaps may or may not have occurred in reality. A PE pupil who proclaims that he is not currently in good physical condition before a soccer match is an example of claimed self-handicapping. Given that the characteristics of the two types of self-handicapping differ (Leary & Shepperd, 1986), it is important to clarify that within the present study we explored self-reported handicaps only.

In addition to self-handicapping, we also assessed a second cognitive strategy, namely defensive pessimism, which involves evaluating possible worst-case scenarios prior to an event and setting excessively low expectations (Norem, 2000). These two facets of defensive pessimism protect one's self-worth by reducing the standards by which one is judged (Martin et al., 2003). Although defensive pessimism and self-

handicapping are assumed to stem from similar motivational antecedents, the few studies that have explored this proposal have reported some differences (e.g., Elliot & Church, 2003; Martin, Marsh, & Debus, 2001a; 2001b). For instance, in two studies using undergraduate students, Elliot and Church (2003) reported that self-handicapping is grounded in avoidance motivation and a lack of approach motivation, whereas defensive pessimism stems from avoidance motivation only. Despite these differences, no PE-based research has concurrently explored the common and unique determinants of these two strategies. Elliot and Church also underscored the importance of exploring competence-based motives as antecedents of self-handicapping and defensive pessimism. In view of this, we explored PE pupils' fear of failure, physical self-concept, and competence valuation as potentially salient competence-based antecedents of defensive pessimism and self-handicapping.

Fear of failure refers to an avoidance-oriented achievement motive that represents one's tendency to act in ways that reduce the risk of experiencing failure (McClelland, Atkinson, Clark, & Lowell, 1953). Fear of failure has been previously linked to both self-protection strategies in several life domains, leading Urdan and Midgley (2001) to suggest that "...the primary motive for engaging in handicapping is a fear of failure...." (p. 119). For example, Elliot and Church (2003) examined various motivational correlates of self-handicapping and defensive pessimism in college students. Results from two studies within that paper revealed that fear of failure positively predicted reported levels of self-handicapping and defensive pessimism. In addition, Elliot, Cury, Fryer, and Huguet (2006) manipulated PE pupils' achievement goal involvement prior to a basketball task. They found that participants holding performance avoidance goals, which

are grounded in fear of failure (Elliot & Church, 1997), reported higher self-handicapping than participants holding performance/mastery approach goals. This finding has been replicated in a dart throwing activity using measures of behavioural self-handicapping (Ntoumanis, Thørgesen-Ntoumani, & Smith, 2009), as well as cross-sectional PE research (Ommundsen, 2004). In view of these findings, we expected that PE pupils' fear of failure would be a positive predictor of strategies, such as self-handicapping and defensive pessimism, which provide protection from threats to one's self-worth (cf. Covington, 2000).

The second potential antecedent of self-handicapping and defensive pessimism investigated in the present study, physical self-concept refers to one's evaluation of his/her qualities and standing in the physical domain (Marsh & Redmayne, 1994). Pupils with high physical self-concept may have less need to use strategies that protect their self-worth, compared to pupils with low physical self-concept. Although no empirical research (in PE or elsewhere) has tested this assumption, related ability-based constructs, such as self-efficacy and academic competence, have been negatively associated with self-handicapping in cross-sectional research with competitive golfers and fifth-grade pupils (Kuczka & Treasure, 2005; Urda et al., 1998). Similarly, self-esteem has been negatively associated with defensive pessimism in university pupils (Norem & Cantor, 1986a). With these related findings in mind, we hypothesized that physical self-concept would negatively predict defensive pessimism and self-handicapping.

The final antecedent explored in the present study, competence valuation, reflects the degree to which an individual cares about performing an activity well (Harackiewicz, & Manderlink, 1984). Although no research has examined competence valuation as a

determinant of the two self-worth protection strategies under investigation in this study, some have explored a similar construct, namely perceived event importance.

Questionnaire-based studies in sport contexts have reported negative (e.g. Kuczka & Treasure, 2005) and non-significant relationships between self-handicapping and reported event importance (e.g., Prapavessis, Grove, Maddison, & Zillmann, 2003); however, experimental research has suggested greater levels of self-handicapping when a task is perceived as important (Shepperd & Arkin, 1989). These equivocal findings and the lack of studies examining the relationship between competence valuation and defensive pessimism indicate the need for further inquiry in this research area. We contend that holding low levels of competence valuation permits pupils to externally attribute their low level of active involvement in PE and reduce expectations of sustained investment in this context. As such, and aligned with the findings of Kuczka and Treasure (2005), we hypothesized that competence valuation will negatively predict the two self-protecting strategies.

It is worth noting that the three potential antecedents of defensive pessimism and self-handicapping may also be viewed over time as outcomes of the two self-worth protection strategies. However, in this cross-sectional study we operationalised these strategies as antecedent variables because, aligned with aforementioned studies in the classroom (e.g., Elliot & Church, 2003), the primary purpose was to examine the role that competence-based motives have in predicting important PE-based outcomes via the use of self-worth protection strategies.

In addition to the investigation of potential predictors, we sought to examine possible outcomes of self-handicapping and defensive pessimism. This is an important

research avenue given that previous literature has identified both positive and negative outcomes. For example, some scholars suggest that, in some instances, defensive pessimism may not lead to negative consequences because it may lead to prefactual thinking (i.e., consideration of alternative outcomes before the actual event; Sanna, 1996) and motivate individuals into putting forth more effort (e.g., Norem & Chang, 2000; Norem & Illingworth, 1993; Showers & Ruben, 1990). On the other hand, a number of long-term negative consequences have been linked to defensive pessimism, such as decreased life-satisfaction and worry (Cantor & Norem, 1989; Norem & Cantor, 1990). Some sport-based research suggests that self-handicapping may also lead to short-term benefits (e.g., self-reports of optimal experiences during competition; Bailis, 2001); however, self-handicapping has also been related to lower effort, reduced performance, as well as higher state anxiety and stress (Elliot, Cury, Fryer, & Huguet, 2006; McCrea & Hirt, 2001; Prapavessis et al., 2003; Urdan, 2004).

In the present study, we aimed to explore the links between the two self-protection strategies and pupils' enjoyment in PE, as well as their future intentions to partake in optional PE programs. The two identified outcomes are important consequences to consider as they both have been related to future participation in leisure-time physical activity (e.g., Cox, Smith, & Williams, 2008, Ntoumanis, 2005). Based on aforementioned research which shows that, despite any short-term benefits, self-handicapping and defensive pessimism are typically associated with negative outcomes (Elliot et al., 2006; Norem & Chang, 2000), we tentatively hypothesized that defensive pessimism and self-handicapping would be negatively associated with enjoyment in PE and future intentions to participate in optional PE programs.

To summarize, in the present study we tested a model (Figure 1), based on previous research in educational (e.g., Elliot & Church, 2003; Norem & Cantor, 1986a; 1990) and sport contexts (e.g., Kuczka & Treasure, 2005; Prapavessis et al., 2003), in which PE pupils' physical self-concept and competence valuation negatively predicted self-handicapping and defensive pessimism. In addition, we hypothesized that fear of failure would positively predict self-handicapping and defensive pessimism. In turn, the two self-worth protecting mechanisms were proposed to negatively predict PE pupils' enjoyment in PE and their intentions to participate in future optional PE programs. Due to previous research showing links between enjoyment and intentions to pursue sporting activities (Lintunen, Valkonen, Leskinen & Biddle, 1999), we also hypothesized a direct relationship between enjoyment and intentions. Moreover, since physical self-concept, fear of failure and competence valuation reflect competence-based judgments (Marsh & Redmayne, 1994; Elliot & Church, 1997; Elliot et al., 2000), they were hypothesized to be positively related.

Although some research has considered gender differences in mean levels of self-handicapping (e.g., Fieck & Rhodewalt, 1997; Rhodewalt & Hill, 1995), no studies have explored the invariance across gender of the relationships hypothesized in the present work between self-handicapping, defensive pessimism and the other examined variables. This is somewhat surprising given the lack of understanding concerning gender differences in self-worth protection processes (Fieck & Rhodewalt, 1997) and the different pressures and threats to self-worth that boys and girls face in physical activity contexts (e.g., Furnham, Badmin, & Sneade, 2002; Gillison, Osborn, Standage, & Skevington, 2009). Moreover, examination of gender differences may shed some light on

the potential reasons underlying the disparity in adolescent male and female physical activity participation rates (National Health Service, 2009). Thus, this study also explored the gender invariance of the relationships specified in Figure 1.

Method

Participants

Participants were 534 (females $n = 275$; males $n = 259$) British pupils from two schools in the south of England. Eighty eight of the pupils were 11 years old, 265 were 12 years old, and 181 were 13 years old.

Measures

Fear of failure. To measure this construct we used the short form of the Performance Failure Appraisal Inventory (Conroy, Willow, & Metzler, 2002). This is a multidimensional measure of cognitive-motivational-relational appraisals associated with fear of failure. A 5-item short form version of the 25-item Performance Failure Appraisal Inventory was used in this study. The items from the short form capture each of the dimensions of the long form. An example item is “When I am failing, I am afraid that I might not have enough talent”. All items were scored on a 1 (*Do not believe at all*) to 5 (*Believe 100% of the time*) scale. Conroy et al (2003) used a -2 to +2 range, however, since all questionnaires employed in our study used scales with positive scores only, we adapted the scale range to avoid confusing our young participants. According to Conroy et al., the short form has good factorial validity and its pattern of correlations with external measures is similar to the pattern displayed by the long form.

Physical Self-Concept. To tap this construct we used the Physical Self-Description Questionnaire (Marsh, Richards, Johnson, Roche, & Tremayne, 1994). The

physical self-concept subscale of this instrument provides a global evaluation of the feelings an individual holds about his/her physical self. Participants responded to six items (e.g., “I feel good about who I am and what I can do physically”) on a 1 (*False*) to 6 (*True*) scale. Marsh et al. provided extensive evidence for the factorial validity of the Physical Self-Description Questionnaire by using confirmatory factor analysis and multitrait-multimethod procedures.

Competence valuation. Two items, adapted for use in PE settings, were taken from Elliot et al. (2000). An example item is “I care very much how I do in P.E.”. Both items were measured on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. Elliot et al. reported high internal reliability for this measure.

Self-handicapping. This construct was measured by adapting to PE the 6-item self-handicapping scale used by Urda et al. (1998) to measure self-handicapping in the classroom. The scale includes a number of proactive anticipatory strategies which pupils use to regulate their self-presentation. An example item is “Some pupils purposely don’t try hard in P.E. so that if they don’t do well, they can say it’s because they didn’t try. How true is this of you?” Responses were measured on 1 (*very much unlike me*) to 6 (*very much like me*) scale. Urda et al. reported evidence for the predictive validity of the questionnaire.

Defensive pessimism. To measure this construct we employed the Defensive Pessimism Scale (Norem & Cantor, 1986b). Nine items were constructed by Norem and Cantor to measure defensive pessimism in academic situations. For the purposes of our study we adopted the scale so that it can be used in PE. An example item is “In future performances I rarely expect good things to go my way”. Responses were rated on a scale

ranging from 1 (*not at all true of me*) to 7 (*very true of me*). Norem and Cantor have found the Defensive Pessimism Scale scores to be reliable and to have good predictive utility.

Enjoyment. To measure this construct we used the Interest/Enjoyment scale of the Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989). Five items were adapted from this inventory to measure enjoyment in PE classes. An example item is “I enjoy PE lessons very much”. The items were measured on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). McAuley et al. showed that the interest/enjoyment subscale of the Intrinsic Motivation Inventory has high internal reliability.

Future intentions to participate in optional PE. Two items were written for this study to measure pupils’ intention to participate in future optional PE classes. An example item is “I would take part in PE even if it was an optional subject”. The items were measured on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Procedure

Consent forms were signed by all the participants, their parents, and the schools’ Head Teachers or the Heads of the PE department. Before questionnaire administration, the pupils were told that they could decline participation in the study or withdraw at any time. Pupils were explicitly told that their responses would be kept in strict confidence and would not be available to their teachers or parents.

Results

Descriptive Statistics, Internal Reliability, and Correlation Coefficients

The participants reported moderate to high levels of physical self-concept, competence valuation, enjoyment and intention to continue to participate in PE (Table 1). They also reported small to moderate scores for self-handicapping, defensive pessimism and fear of failure. The Cronbach alpha coefficients were above .70 for all variables. Most correlation coefficients were in the expected direction. Specifically, self-handicapping and defensive pessimism were negatively correlated with physical self-concept and positively correlated with fear of failure. The correlations for defensive pessimism were substantially larger than those for self-handicapping. Defensive pessimism was also negatively correlated with competence valuation. Intention for future participation in PE and enjoyment were negatively related to self-handicapping and defensive pessimism. Lastly, defensive pessimism was positively correlated with self-handicapping.

Testing a Model of Antecedents and Consequences of Defensive Pessimism and Self-Handicapping

The proposed model (Figure 1) was tested with the software EQS 6.1 (Bentler & Wu, 2002) using structural equation modelling with the robust maximum likelihood estimation method (Mardia's normalized estimate of multivariate kurtosis = 56.82). According to Bentler and Wu, this method offers more accurate standard errors, chi-square values and fit indices when the data are not normally distributed. The overall fit of each tested model to the data was examined via the Satorra-Bentler scaled chi-square test (χ^2) and other fit indices provided by EQS 6.1. These were the Robust Comparative Fit Index, the Robust Non-Normed Fit Index, the Robust Root Mean Square Error of Approximation with its 90% confidence interval, and the Standardized Root Mean Square

Residual. Based on the criteria advanced by Hu and Bentler (1999), a good model fit is obtained when the Comparative Fit Index and the Non-Normed Fit Index values are close to .95, the Standardized Root Mean Square Residual is close to .08 and the Root Mean Square Error of Approximation is close to .06. The loadings and uniqueness terms of the factor indicators are not presented in Figure 2 for presentation simplicity purposes, but are available upon request from the first author.

The results suggested that the hypothesized model fit the data relatively well: Satorra-Bentler $\chi^2(546) = 1048.33, p < .001$; Robust Comparative Fit Index = .93; Robust Non-Normed Fit Index = .93; Robust Root Mean Square Error of Approximation = .04 (90% CI = 0.03 -0.05); Standardized Root Mean Square Residual = .08. However, the modification indices suggested that the paths from physical self-concept to self-handicapping ($\beta = -.09$), and from the latter variable to enjoyment ($\beta = -.06$) and intention ($\beta = -.01$) should be removed because they were not statistically significant. Also, modification indices suggested that a path should be added from competence valuation to intentions. This path made conceptual sense (see Discussion section) and was, therefore, added to the model. After implementing the changes suggested by the modification indices the model fit improved slightly: Satorra-Bentler $\chi^2(548) = 951.096, p < .001$; Robust Comparative Fit Index = .95; Robust Non-Normed Fit Index = .94; Robust Root Mean Square Error of Approximation = .04 (90% CI = 0.03 -0.04); Standardized Root Mean Square Residual = .07. As can be seen in Figure 2, self-handicapping and defensive pessimism were positively predicted by fear of failure and negatively predicted by competence valuation. Defensive pessimism was also negatively predicted by physical self-concept. In turn, defensive pessimism negatively predicted enjoyment in PE and

intentions to participate in future PE programs. Self-handicapping did not predict enjoyment or intention. Intention was positively predicted by enjoyment and by competence valuation. Physical self-concept was positively related to competence valuation and negatively related to fear of failure. Fear of failure and competence valuation were positively related. Small indirect effects were found from fear of failure to enjoyment ($\beta = -.11$; $p < .01$) and intention ($\beta = -.16$; $p < .01$).

Testing the Gender Invariance of the Model

Multi-sample structural equation modelling was used to examine the invariance of the model across males and females, in line with the steps advanced by Bentler and Wu (2002). The initial step in this analysis involves the establishing of a baseline model for males and females via single sample analysis. In both samples, the model fit was good (see Table 2), however, the path coefficient from competence valuation to self-handicapping in the female sample, and from physical self-concept to defensive pessimism in the male sample (as well as the covariance between fear of failure and competence valuation in the same sample), were not significant, and thus were removed. Having established a baseline model for males and females separately, a sequence of increasingly constrained nested models was explored. Invariance testing began with the least restrictive model in which only the form of the model was tested for invariance without placing any constraints. This model fit the data well. Next, the factor loadings were constrained to be invariant across the groups. We ran this analysis twice by changing which item indicators were fixed to 1.0 for identification purposes, as equality constraints cannot be placed on fixed parameters. In line with Scott-Lennox and Lennox (1995), equality constraints were removed only if they dramatically improved the model

fit (value of 5.0 or higher per *df*). Two item loadings (on the fear of failure and enjoyment factors) were found to be non-equivalent across gender and their constraints were released.

The subsequent step involved constraining the factor variances and covariances across groups. All constraints were upheld. We then constrained all regression coefficients in the model. The results indicated that the path from fear of failure to defensive pessimism was not equivalent across gender (males $b = .91$; females $b = .75$; for between-group comparisons only unstandardised parameter coefficients can be used; see Hair, Anderson, Tatham, & Black, 1998). Finally, the residual variances of all observed variables and latent factors were tested for gender equivalence; only one residual associated with an enjoyment item was found not to be invariant across gender.

In summary, the multi-sample testing indicated partial gender invariance (Byrne, 1994) and good fit indices, even for the most restrictive model. Across over 80 constrained parameters, only 2 factor loadings, 1 path coefficient and one error variance term were found non-invariant. Despite the statistically significant differences, the non-invariant paths were of a relatively similar magnitude and in the same direction (i.e., positive). In fact, if the Cheung and Rensvold (2002) test of difference between constrained models was used (i.e., the more constrained model is suggested to fit as well as than the less constrained one when the difference between the Comparative Fit Index values of these models is less than .01), then full invariance could have been claimed (see Table 2).

Discussion

In the present study we examined potential antecedents and consequences of two cognitive self-worth protection strategies (viz., self-handicapping and defensive pessimism) in the context of PE. The results indicated that PE pupils' competence valuation negatively predicted, while fear of failure positively predicted, both strategies. Pupils' physical self-concept also positively predicted defensive pessimism. A positive relationship between physical self-concept and competence valuation and between fear of failure and competence valuation, as well as a negative relationship between physical self-concept and fear of failure were also found. Defensive pessimism was negatively associated with pupils' enjoyment in PE and their future intentions to participate in optional PE programs. In contrast to our hypothesis, self-handicapping did not predict enjoyment or intentions. Finally, pupils' intentions to pursue optional PE were positively predicted by competence valuation and enjoyment. These relationships were found to be largely invariant across gender. In the following, we discuss these relationships in the context of previous research and provide implications for practice and future empirical inquiry.

The finding that PE pupils' fear of failure positively predicted their level of self-handicapping and defensive pessimism is consistent with previous research that suggests avoidance motivation to be a key antecedent of the two self-worth protection strategies (e.g., Elliot & Church, 2003; Ommundsen, 2001; Urdan & Midgley, 2001). Regarding self-handicapping, it may seem illogical for pupils to desire to avoid failure and yet claim or even create obstacles that enhance the likelihood of failure. Nonetheless, Urdan and Midgley suggest that the self-handicapping process allows one to attribute failure in a specific situation to external factors and avoid internal ability-based feelings of failure.

The relationship between fear of failure and defensive pessimism seems less complex as an individual who desires to avoid failure is likely to lower their expectations in an attempt to succeed in doing so. Overall, these findings imply that pupils with high levels of fear of failure are more likely to protect their self-worth by, for example, putting forth less effort, procrastinating or setting markedly low goals. These self-imposed impediments or expectations are more appealing to these pupils, compared to experiencing failure that would be attributed to their ability (Ommundsen, 2001). In contrast, pupils with lower fear of failure are able to focus on the task itself using adaptive self-regulatory processes, rather than being preoccupied about protecting their self-worth (Elliot & Church, 1997).

Our hypothesis that competence valuation would negatively predict self-handicapping and defensive pessimism was also supported. To our knowledge, this is the first study to report a relationship between competence valuation and defensive pessimism. Further, previous research has reported equivocal findings between a similar construct, perceived event importance, and self-handicapping (e.g., Kuczka & Treasure, 2005; Prapavessis et al., 2003; Shepperd & Arkin, 1989). The significant negative relationships found in the present study seem cogent, given that competence valuation reflects the level of invested effort and anticipated success (Elliot et al., 2000), and that self-handicapping and defensive pessimism may allow one to reduce the level of investment and expectations in an activity without damaging one's sense of self-worth (at least in the short-term). In addition, we found competence valuation to be directly related to pupils' future intentions to participate in optional PE programs. Although we did not hypothesize such a direct relationship in our original model, expectancy-value theory

(Wigfield & Eccles, 2000) posits that individuals who place importance on an activity are more likely to choose (or intend to choose) to partake in that activity. Therefore, it is reasonable to suggest that pupils who care about doing well and succeeding in PE will be likely to intend to continue PE. These findings imply that pupils who do not care about doing well in PE may be the most frequent users of self-worth protection strategies and the least likely to pursue optional PE.

In accordance with our hypothesis, physical self-concept was negatively related to defensive pessimism. This is the first study to examine the relationship between these two variables, nonetheless, other self-evaluative beliefs, such as self-esteem, have been previously negatively associated with defensive pessimism outside the context of PE (Norem & Cantor, 1986a). Contrary to our hypothesis, however, physical self-concept did not significantly predict self-handicapping. Tice (1991) suggests that self-esteem may not be a predictor of self-handicapping because pupils who differ in levels of self-esteem use self-handicapping for different purposes. Pupils high in self-esteem may self-handicap to enhance their self-worth (i.e., by being successful despite the claimed obstacle), while pupils with low self-esteem may self-handicap to protect their self-worth (i.e., by creating a reason for failure other than their ability). This same argument may also be applicable to pupils with differing levels of physical self-concept.

In addition to examining antecedents of self-handicapping and defensive pessimism, we also explored two important PE-based consequences, future intentions to pursue optional PE and enjoyment. Although some previous experimental and longitudinal research has found no harmful effects of defensive pessimism on performance outcomes in the short-term (Norem & Illingworth, 1993; Showers & Ruben,

1990), the affective (i.e., enjoyment) and cognitive (i.e., intentions) concepts measured in the present study were found to be negatively associated with this self-worth protection strategy. Thus, pupils who set unrealistically low expectations and preoccupy themselves with concerns about worst-case scenarios are less likely to enjoy PE and participate in it the future, even though their immediate performance may be unaffected. Therefore, helping PE pupils to develop realistic personal expectations and focusing on potential successful outcomes seems an important objective for PE practitioners.

Contrary to our hypothesis, self-handicapping did not predict enjoyment or intentions. Previous lab- and survey-based research has reported equivocal findings concerning the relationship between self-handicapping and positive outcomes (e.g., Deppe & Harackiewicz, 1996; Martin et al., 2001a). Perhaps these ambiguous findings, along with the non-significant relationship in the present study, may be clarified by future consideration of the different short- and long-term reasons for self-handicapping. In the short-term, pupils who self-handicap to enhance their self-worth (i.e., succeeding despite an obstacle) may experience positive benefits, whereas, pupils who self-handicap to protect their self-worth (i.e., failure is attributed to an impediment) may suffer negative outcomes (Martin et al., 2001a). Despite self-handicapping providing some immediate benefits to pupils seeking self-worth enhancement, this strategy is likely to be fragile in the face of failure, especially after repeated episodes. To this end, research has shown detrimental effects of self-handicapping for longer-term progression, well-being and health (e.g., see Zuckerman & Tsai, 2005).

An additional issue that warrants attention in the “self-handicapping – outcome” relationship is the role of moderating variables, such as pupils’ self-esteem, which may

determine whether positive or negative short-term effects occur. For instance, it is likely that a high self-esteem pupil who self-handicaps enjoys PE and intends to participate in PE more, compared to a low self-esteem pupil, despite similar levels of self-handicapping in both pupils (Tice, 1991). Future research may wish to examine underlying reasons for self-handicapping, rather than simply the degree of self-handicapping reported. A focus on the nature of self-esteem (e.g., true and stable as opposed to insecure or unstable) in such work would also glean valuable insight (see Zuckerman & Tsai, 2005).

Collectively, research of this nature may be able to identify moderators that better predict circumstances in which self-handicapping will result in specific consequences.

In the present study, most of the relationships of the structural part of the tested model were found to be invariant across pupil gender (i.e., we found support for partial invariance). When analysing males and females separately, only the relationships between competence valuation and self-handicapping in the female sample, and physical self-concept and defensive pessimism in the male sample (as well as the covariance between fear of failure and competence valuation in the same sample) were not significant. In the invariance test using the combined sample, only the relationship between fear of failure and defensive pessimism differed, being slightly stronger in males compared to females. Although gender differences in mean levels of self-handicapping have been previously reported (Feick & Rhodewalt, 1997; Rhodewalt & Hill, 1995), this study is the first to examine gender invariance in the relationships between the assessed antecedents and consequences of the two self-worth protection strategies. It would, therefore, be injudicious to speculate on reasons for these differences, especially given that the differences between the path coefficients were relatively small. Taken as a whole,

the general invariance of the structural model signifies that most of the processes discussed in the present study are applicable to both male and female PE pupils.

In applied terms, the model may give some insight into possible reasons for pupils participating in optional PE or enjoying their time in compulsory PE classes. Pupils who care about doing well in PE, do not fear failure and have positive beliefs about their physical self may be less likely to adopt self-worth protection strategies. Accordingly, these pupils may be more likely to enjoy their experiences in PE and intend to pursue optional PE programs, both of which are important precursors to reported leisure-time physical activity behaviour (Cox et al., 2008; Ntoumanis, 2005). PE practitioners should aim to reduce fear of failure by providing multiple opportunities for success for all pupils (Chen, Wu, Kee, Lin, & Shui, 2009). Moreover, teachers should emphasise the importance of PE and use strategies (e.g., modelling), to enhance pupils' self-perceptions (Clark & Ste-Marie, 2007).

Despite the conceptual and applied advancements made by the present study, certain limitations and future directions deserve attention. For example, although we have labelled variables in the present study as antecedents and consequences of self-handicapping and defensive pessimism based on conceptual arguments and previous related empirical work, we cannot demonstrate such roles due to the cross-sectional nature of the data. Having said this, experimentally manipulating individuals' relatively stable motives (e.g., fear of failure) and beliefs (e.g., physical self-concept) maybe a very difficult task. Nevertheless, longitudinal cross-lagged research designs can be useful in exploring possible reciprocal relationships in our model.

Another methodological limitation of the present study was its reliance on self-report measures. Future studies may wish to use alternative sources of information where possible, such as observational data or interviews when examining self-handicapping and defensive pessimism. In particular, in-depth interviews probing PE pupils' explanations for engaging in self-handicapping and defensive pessimism may provide insight into the tactical use of these strategies under certain circumstances during PE lessons.

Future research may also wish to examine different facets of defensive pessimism and related consequences. The items used to measure defensive pessimism in the present study assessed the degree to which pupils hold low expectations. Some previous research, however, proposes that two types of defensive pessimism exist; one that involves setting low expectations and planning for failure, and one that considers failure yet maximizes effort to avoid such an occurrence (e.g., Martin et al., 2003). The former seems to have negative implications, as in the present study, while the latter may lead to adaptive consequences (Elliot & Church, 2003). Subsequent research in PE may wish to adopt this dualistic approach when examining defensive pessimism.

Finally, the present study focussed exclusively on individual difference variables as determinants of pupils' tendency to protect their self-worth, however, previous research has suggested that the learning environment may also be an important contextual antecedent to consider (e.g., Standage et al., 2007). Potential interaction effects between the PE motivational environment and dispositional variables may be investigated. For example, pupils' self-concept may moderate the deleterious impact of a normative-referenced environment on pupils' self-worth protection strategies.

In conclusion, this study extends limited work on self-handicapping in PE and is the first to examine defensive pessimism in the same context. The model tested in this study extends previous literature by investigating the two self-worth protection strategies collectively in the context of PE and by identifying some new unique and shared determinants and consequences of these two strategies.

References

- Bailis, D. S. (2001). Benefits of self-handicapping in sport: A field study of university athletes. *Canadian Journal of Behavioural Science, 33*, 213–223.
- Bentler, P.M., & Wu, E.J.C. (2002). EQS 6 for Windows: User's guide. Encino, CA: Multivariate Software.
- Berglas, S., & Jones, E. E. (1978). Drug choice as a self-handicapping strategy in response to noncontingent success. *Journal of Personality and Social Psychology, 36*, 405–417.
- Byrne, B. M. (1994). *Structural equation modeling with EQS and EQS/Windows: Basic concepts, applications, and programming*. Thousand Oaks, CA: Sage.
- Cantor, N., & Norem, J. K. (1989). Defensive pessimism and stress and coping. *Social Cognition, 7*, 92–112.
- Chen, L. H., Wu, C. H., Kee, Y. H., Lin, M. S., & Shui, S. H. (2009). 2 × 2 achievement goal and self-handicapping: An examination of the hierarchical model of achievement motivation in physical education. *Contemporary Educational Psychology, 34*, 298-305.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indices for testing measurement invariance. *Structural Equation Modeling, 9*, 233–255.
- Clark, S. E. & Ste-Marie, D. M. (2007). The impact of self-as-a-model interventions on children's self-regulation of learning and swimming performance. *Journal of Sports Sciences, 25*, 577-586.

- Conroy, D.E., Willow, J.P., & Metzler, J.N. (2002). Multidimensional fear of failure measurement: The Performance Failure Appraisal Inventory. *Journal of Applied Sport Psychology, 14*, 76–90.
- Covington, M. (2000). Goal theory, motivation, and school achievement: An integrative review. *Annual Review of Psychology, 51*, 171–200.
- Cox, A. E., Smith, A. L., & Williams, L. (2008). Change in physical education motivation and physical activity behavior during middle school. *Journal of Adolescent Health, 43*, 506-513.
- Deppe, R., & Harackiewicz, J. M. (1996). Self-handicapping and intrinsic motivation: Buffering intrinsic motivation from the threat of failure. *Journal of Personality and Social Psychology, 70*, 868 - 876.
- Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72*, 218–232.
- Elliot, A. J. & Church, M. A. (2003). A motivational analysis of defensive pessimism and self-handicapping. *Journal of Personality, 71*, 369-396.
- Elliot, A. J., Cury, F., Fryer, J. W., & Huguet, P. (2006). Achievement goals, self-handicapping, and performance attainment: A mediational analysis. *Journal of Sport and Exercise Psychology, 28*, 344–361.
- Elliot, A. J., Faler, J., McGregor, H. A., Campbell, W. K., Sedikides, C., & Harackiewicz, J. (2000). Competence valuation as a strategic intrinsic motivation process. *Personality and Social Psychology Bulletin, 26*, 780-794.
- Feick, D., & Rhodewalt, F. (1997). The double-edged sword of self-handicapping:

- Augmenting success and discounting failure. *Motivation and Emotion*, 21, 145-161.
- Furnham, A., Badmin, N., & Sneade, I. (2002). Body image dissatisfaction: Gender differences in eating attitudes, self-esteem, and reasons for exercise. *Journal of Psychology*, 136, 581–596.
- Gillison, F., Osborn, M., Standage, M., & Skevington, S. (2009). Exploring the experience of introjected regulation for exercise across gender in adolescence. *Psychology of Sport and Exercise*, 10, 309-319.
- Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1998). *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- Harackiewicz, J. M., & Manderlink, G. (1984). A process analysis of the effects of performance-contingent rewards on intrinsic motivation. *Journal of Experimental Social Psychology*, 20, 531-551.
- Hu, L., & Bentler, P.M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Kuczka, K., & Treasure, D. C. (2005). Self-handicapping in competitive sport: Influence of the motivational climate, self-efficacy, and perceived importance. *Psychology of Sport and Exercise*, 6, 539–550.
- Leary, M. R., & Shepperd, J. A. (1986). Behavioral self-handicaps versus self-reported handicaps: A conceptual note. *Journal of Personality and Social Psychology*, 51, 1265–1268.

- Lintunen, T., Valkonen, A., Leskinen, E., & Biddle, S. J. H. (1999). Predicting physical activity intentions using a goal perspectives approach : A study of Finnish youth. *Scandinavian Journal of Medicine & Science in Sports, 9*, 344-352.
- Marsh, H. W., & Redmayne, R. S. (1994). A multidimensional physical self-concept and its relations to multiple components of physical fitness. *Journal of Sport and Exercise Psychology, 16*, 43-55.
- Marsh, H. W., Richards, G. E., Johnson, S., Roche, L., & Tremayne, P. (1994). Physical self-description questionnaire: Psychometric properties and multitrait-multimethod analysis of relations to existing instruments. *Journal of Sport and Exercise Psychology, 16*, 270-305.
- Martin, A. J., Marsh, H. W., & Debus, R. L. (2001a). A quadripartite representation of self-handicapping and defensive pessimism. *American Educational Research Journal, 38*, 583–610.
- Martin, A. J., Marsh, H. W., & Debus, R. L. (2001b). Self-handicapping and defensive pessimism: Exploring a model of predictors and outcomes from a self-protection perspective. *Journal of Educational Psychology, 93*, 87–102.
- Martin, A. J., Marsh, H. W., Williamson, A., & Debus, R. L. (2003). Self-handicapping, defensive pessimism, and goal orientation: A qualitative study of university students. *Journal of Educational Psychology, 95*, 617-628.
- McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the intrinsic motivation inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport, 60*, 48-58.

- McClelland, D.C., Atkinson, J.W., Clark, R.A., & Lowell, E.L. (1953). *The achievement motive*. New York: Appleton Century Crofts.
- McCrea, S. M. & Hirt, E. R. (2001). The role of ability judgments in self-handicapping. *Personality and Social Psychology Bulletin*, 27, 1378-1389.
- National Health Service (2009). *Statistics on obesity, physical activity and diet: England, February 2009*. Leeds, UK: Author.
- Norem, J. K. (2000). Defensive pessimism, optimism and pessimism. In E. C. Chang (Ed.) *Optimism and pessimism: Implications for theory, research and practice* (pp. 77-100). Washington, DC: APA Press.
- Norem, J. K. & Cantor, N. (1986a). Anticipatory and post hoc cushioning strategies: Optimism and defensive pessimism in “risky” situations. *Cognitive Therapy and Research*, 10, 347-362.
- Norem, J. K. & Cantor, N. (1986b). Defensive pessimism: Harnessing anxiety as motivation. *Journal of Personality and Social Psychology*, 52, 1208-1217.
- Norem, J., & Cantor, N. (1990). Capturing the “flavor” of behavior: Cognition, affect, and interpretation. In B. Moore, & A. Isen (Eds.), *Affect and social behavior: Studies in emotion and social interaction* (pp. 39–63). New York: Cambridge University Press.
- Norem, J. K. & Chang, E. C. (2000). A very full glass: Adding complexity to our thinking about the implications and applications of optimism and pessimism research. In E. C. Chang (Ed.) *Optimism and pessimism: Implications for theory, research and practice* (pp. 347-367). Washington, DC: APA Press.

- Norem, J. K. & Illingworth, K. S. S. (1993) Strategy dependent effects of reflecting on self and tasks: Some implications of optimism and defensive pessimism. *Journal of Personality and Social Personality*, 65, 822-835.
- Ntoumanis, N. (2005). A prospective study of participation in optional school physical education based on self-determination theory. *Journal of Educational Psychology*, 97, 444-453.
- Ntoumanis, N., Thørgesen-Ntoumani, C., & Smith, A. L. (2009). Achievement goals, self-handicapping, and performance: A 2 × 2 achievement goal perspective. *Journal of Sports Sciences*, 27, 1471-1482.
- Ommundsen, Y. (2001). Self-handicapping strategies in physical education classes: The influence of implicit theories of the nature of ability and achievement goal orientations. *Psychology of Sport and Exercise*, 2, 139-156.
- Ommundsen, Y. (2004). Self-handicapping related to task and performance-approach and avoidance goals in physical education. *Journal of Applied Sport Psychology*, 16, 183-197.
- Prapavessis, H., Grove, J. R., Maddison, R., & Zillmann, N. (2003). Self-handicapping tendencies, coping, and anxiety responses among athletes. *Psychology of Sport and Exercise*, 4, 357-375.
- Rhodewalt, F., & Hill, S. K. (1995). Self-handicapping in the classroom: The effects of claimed self-handicaps on responses to academic failure. *Basic and Applied Social Psychology*, 16, 397-316.

- Sanna, L. J. (1996). Defensive pessimism, optimism, and simulating alternatives: Some ups and downs of prefactual and counterfactual thinking. *Journal of Personality and Social Psychology, 71*, 1020-1036.
- Scott-Lennox, J. A., & Lennox, R. D. (1995). Sex-race differences in social support and depression in older low-income adults. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 199–216). Thousand Oaks, CA: Sage.
- Shepperd, J. A., & Arkin, R. M. (1989). Self-handicapping: The moderating roles of public self-consciousness and task importance. *Personality and Social Psychology Bulletin, 15*, 252-265.
- Showers, C., & Ruben, C. (1990). Distinguishing defensive pessimism from depression: Negative expectations and positive coping mechanisms. *Cognitive Therapy and Research, 14*, 385–399.
- Standage, M., Treasure, D., Hooper, K., & Kuczka, K. (2007). Self-handicapping in school physical education: The influence of the motivational climate. *British Journal of Educational Psychology, 77*, 81-99.
- Tice, D. M. (1991). Esteem protection or enhancement? Self-handicapping motives and attributions differ by trait self-esteem. *Journal of Personality and Social Psychology, 60*, 711 - 725.
- Urdan, T. (2004). Predictors of academic self-handicapping and achievement: Examining achievement goals, classroom goal structures, and culture. *Journal of Educational Psychology, 96*, 251–264.

Urdan, T. C., & Midgley, C. (2001). Academic self-handicapping: What we know, what more there is to learn. *Educational Psychology Review, 13*, 115-139.

Urdan, T., Midgley, C., & Anderman, E. (1998). The role of classroom goal structure in students' use of self-handicapping strategies. *American Educational Research Journal, 35*, 101-122.

Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25*, 68-81.

Zuckerman, M., & Tsai, F. F. (2005). Costs of self-handicapping. *Journal of Personality, 73*, 411-442.

Table 1

Descriptive Statistics, Cronbach's Alpha Coefficients and Correlation Coefficients for All Variables Included in the Study

	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6
1. Physical Self-Concept	4.52	1.07	.92						
2. Fear of Failure	2.64	1.00	.78	-0.21**					
3. Competence Valuation	5.23	1.79	.86	0.26**	0.10*				
4. Self-Handicapping	2.66	1.14	.81	-0.15**	0.23**	-0.07			
5. Defensive Pessimism	3.26	1.45	.88	-0.35**	0.45**	-0.17**	0.31**		
6. Intention	4.79	2.02	.75	0.32**	-0.09*	0.53**	-0.12**	-0.33**	
7. Enjoyment	4.63	1.68	.88	0.22**	0.01	0.37**	-0.10*	-0.17**	0.39**

Note: Competence valuation, defensive pessimism, enjoyment and intention to participate in future PE classes were measured with 7-point scales. Physical self-concept and self-handicapping were measured with 6-point scales. Lastly, fear of failure was measured with a 5-point scale. Intention= Future intention to participate in optional PE.

* $p < .05$; ** $p < .01$

Table 2

Multi-Sample Invariance Analysis across Gender

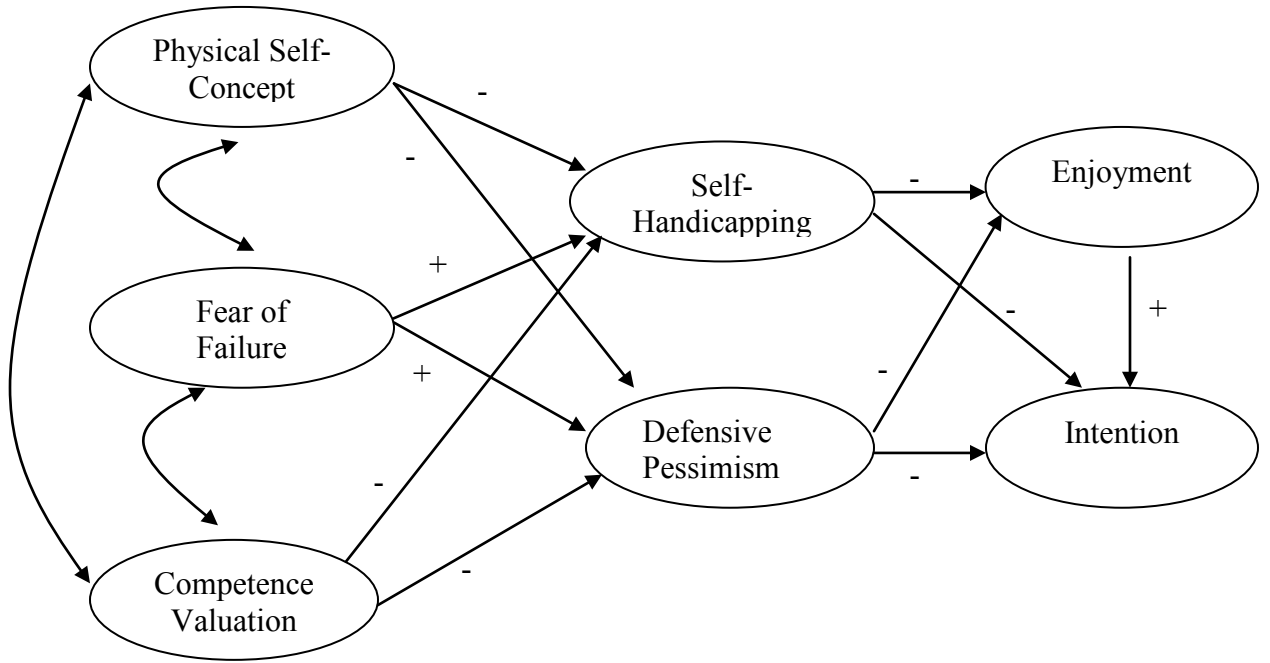
Model Tested	Satorra-Bentler χ^2	df	CFI	NNFI	SRMR	RMSEA (90 % CI)
Females Only	773.96*	549	.94	.94	.08	.04 (.03 - .05)
Males Only	769.20*	550	.94	.94	.08	.04 (.03 - .05)
Form Invariance	1545.22*	1100	.94	.94	.08	.04 (.03 - .04)
Factor Loadings Invariance	1577.27*	1128	.94	.94	.08	.04 (.03 - .04)
Added						
Factor Variance/Covariance	1583.67*	1132	.94	.94	.09	.04 (.03 - .04)
Invariance Added						
Path Coefficients	1597.48*	1139	.94	.94	.09	.04 (.03 - .04)
Invariance Added						
Residual Variance Added	1624.27*	1177	.94	.94	.09	.04 (.03 - .04)

* $p < .001$.

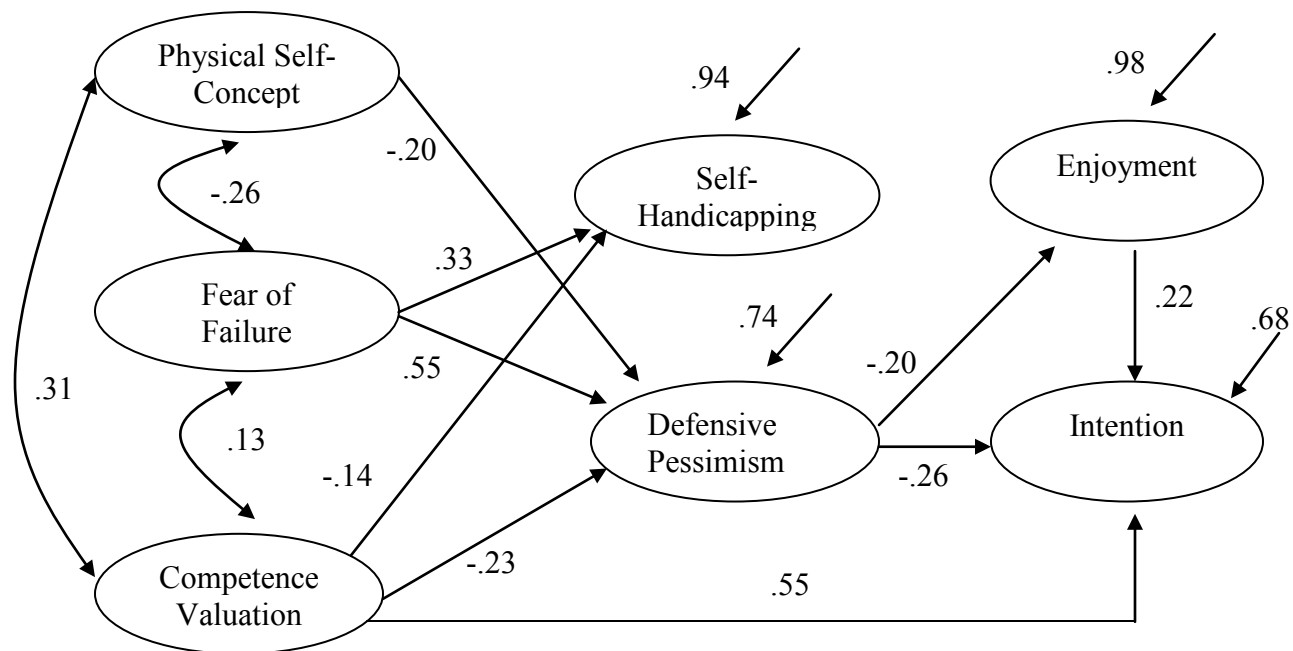
Figure Captions

Figure 1. Hypothesized model of antecedents and consequences of defensive pessimism and self-handicapping in school physical education.

Figure 2. Revised model of antecedents and consequences of defensive pessimism and self-handicapping in school physical education.



Note: Intention= Future intention to participate in optional PE.



Note: Only significant paths are shown. The path from Competence Valuation to Intention was added in the modified model. Intention= Future intention to participate in optional PE.