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 Associations between trait personality, anxiety, self-efficacy and intentions to exercise by gender in high school physical education

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ABSTRACT
Trait personality has been associated with achievement and many of its related outcomes in settings such as education, health, physical activity and sport. Scant trait personality research has been performed among school-age students in physical education, so this study investigates relations between the six-dimension (HEXACO) model of trait personality and anxiety, self-efficacy and intentions to exercise as a function of gender in 316 high school physical education students. Students completed validated measures of these constructs. Results revealed that trait personality (particularly the social self-esteem aspect of extraversion) predicted lower anxiety and higher self-efficacy and intentions to exercise in both females and males. Openness to experience was predictive of both anxiety and lowered self-efficacy in females. It appears that physical educators should consider the role of the HEXACO personality traits and sub-traits in their students and potentially differentiate instruction to better accommodate students who are more vulnerable. From this study, it appears that students who are less extraverted and females who are more open to experience may be at be more at risk for anxiety and lower self-efficacy in physical education which may compromise their intentions to exercise.

Personality refers to ‘psychological qualities that contribute to an individual’s enduring and distinctive patterns of feeling, thinking, and behaving’ (Pervin & Cervone, 2010, p. 8). Although research has contributed substantially to knowledge about the role of many personal characteristics (e.g. interests, beliefs, goals, gender) on students’ achievement in physical education (Solmon, 2006), little is yet known about the role of trait personality – that is, ‘consistent preferences or patterns of behavior’ (Chamorro-Premuzic & Furnham, 2005, p. 7) – among school-age physical education (PE) students. Trait personality has shown to be a noteworthy correlate of achievement and its related outcomes in many settings including academic learning (Ackerman, 2013), health (Jackson, Dimmock, Gucciardi, & Grove, 2011), physical activity (Rhodes & Pfaeffli, 2012; Rhodes & Smith, 2006; Wilson & Dishman, 2015) and sport (Allen, Greenlees, & Jones, 2013); often with lifespan implications (Stephan, Boiché, Canada, & Terracciano, 2014). Meanwhile, the limited research on personality in PE settings has
focused on teachers and/or teacher candidates (e.g. (Arbabisarjou, Sourki, & Bonjar, 2016; Hassan, Shelvam, Bhat, & Wani, 2016; Tok & Morali, 2009) with relatively minor if any investigation of school-age students (Phillips, Carlisle, Hautala, & Larson, 1985). Consequently, more research is needed in school PE settings that investigates relations between trait personality and other established achievement-related constructs such as gender (Flintoff & Scratton, 2006), intentions to exercise (Chatzisarantis & Hagger, 2008; Hagger & Chatzisarantis, 2016), anxiety and self-efficacy (Lodewyk & Sullivan, 2015; Pintrich & Schunk, 1996; Solmon, 2006). Such a study could help improve healthy-active lifestyles also because personality appears to be particularly susceptible to change during childhood and adolescence (Allen et al., 2013).

**Trait personality**

Advances in the quantitative measurement of personality traits through, for example, factor analytic procedures, have enabled the consolidation of numerous behavioural traits into a set of five relatively independent factors or dimensions with validity across a host of settings and ages (Costa & McCrae, 1992). These are emotionality (E; also referred to as neuroticism), extraversion (X), agreeableness (A), conscientiousness (C), and openness to experience (O). More recently, research by Ashton and Lee (2007) has slightly altered the agreeableness and emotionality or neuroticism dimensions and added a sixth dimension called honesty-humility (H). This six-dimension (HEXACO) model of trait personality has also been validated in multiple cultures, languages and age-levels (Ashton & Lee, 2007, 2010; Lee & Ashton, 2004). The main traits within each of these dimensions are: (H) sincere, honest, loyal, modest, unassuming, and ethical; (E) neuroticism, emotional, over-sensitive, anxious and clingy; (X) outgoing, lively, sociable, cheerful and confident; (A) patient, tolerant, peaceful, mild and forgiving; (C) organised, self-disciplined, hard-working, efficient and precise; and (O) intellectual, creative, unconventional, innovative and inquisitive (Ashton, 2013).

Research (for reviews, see Ackerman, 2013; Allen et al., 2013) has revealed associations between various combinations of personality traits, academic achievement and related behaviours such as motivation, coping strategies, relationship and job satisfaction and burnout. The cluster or dimension of trait personality most commonly associated with academic achievement is conscientiousness along with (yet, less so) openness to experience and emotional stability/low neuroticism. In other words, higher academic achieving individuals tend to display behavioural traits such as organisation, precision, self-discipline, self-assuredness, independence, creativity, innovation and inquisitiveness. Meanwhile, research in sport and physical activity settings (e.g. Huang, Lee, & Chang, 2007; Smith, Gallo, Shivpuri, & Brewer, 2012) has reported associations between some dimensions of trait personality and elevations in motivation, engagement, achievement and indices of health and quality of life. Of the five main personality dimensions, physical activity is most closely and consistently linked to extraversion, conscientiousness and low emotional stability/high neuroticism (Rhodes & Pfaeffli, 2012; Rhodes & Smith, 2006) with some additional though modest evidence of links to openness to experience (Wilson & Dishman, 2015). For example, Courneya and Hellsten (1998) found that neuroticism (negatively) and extraversion (positively) predicted exercise participation and adherence, whereas neuroticism and low conscientiousness predicted a lack of motivation for exercise. These same dimensions – except for lower rather than higher emotionality/neuroticism – are most consistently associated with sport participation (Allen et al., 2013).
et al., 2013). It appears that the heightened energy and arousal demands and results of physical activity and sport may entice more extraverted individuals to participate in them, although that may depend on the social setting since more extraverted individuals tend to participate in team sports, whereas less extraverted individuals are prone to prefer individual sports (Allen et al., 2013; Jackson et al., 2011).

**Path model**

This study serves to investigate the fit of a proposed path model (see Figures 1 and 2) wherein six dimensions of personality traits (honesty-humility, emotionality, extraversion, agreeableness, conscientiousness and openness to experience) relate indirectly to intentions to exercise through anxiety and self-efficacy for performance as a function of gender in high school PE students. This proposed path model is based mainly on research originating out of two theoretical frameworks; namely, the theory of planned behaviour (Ajzen, 1991) and cognitive-mediation theory (Doyle, 1983). According to the first, intentions to exercise function as part of the decision-making process wherein persons form intentions on the basis of personal goals, attitudes and perceptions of control, expected outcomes and social norms. Research has supported the role of these beliefs on intentions to exercise (Chatzisarantis & Hagger, 2008; Hagger & Chatzisarantis, 2016) which can mediate the effect of personal beliefs on physical activity (Ajzen, 1991). Intentions to exercise have also been theoretically and empirically linked to autonomous motivation in PE and exercise behaviour outside of PE through research into the transcontextual model of autonomous motivation (Hagger & Chatzisarantis, 2016). Further, personality has been shown to have a statistically moderating effect on this intention to exercise and exercising behaviour relationship (Rhodes & Courneya, 2003) although not yet in PE.

Cognitive-mediation theory provides additional support to the proposed path model in this study by postulating and providing research evidence that instruction can mediate academic outcomes such as students’ intentions through students’ personal characteristics that include their personality, beliefs, motives and use of strategies (Ackerman, 2013). Furthermore, differences in students’ personality traits can also serve as a cognitive filter affecting social cognitions like perceptions, emotions (anxiety) and self-efficacy ‘towards a behavior, which in turn influence the behaviour [intentions] itself’ (Rhodes & Smith, 2006,

![](image)

**Figure 1.** Path analysis for females.

Note: Standardised values are given. *p < .05.
As a result, behavioural intentions to exercise are not expected to increase directly from personality; rather, personality is expected to manifest its role in PE in this study through its influence on and associations with self-beliefs such as anxiety and self-efficacy. This is because anxiety (being cognitively, emotionally and physically tense about something) and self-efficacy (beliefs in one’s ability to succeed on a particular task) tend to relate significantly and negatively together (Lodewyk & Sullivan, 2015; Solmon, 2006). They are often similarly though inversely linked to feelings of vulnerability, a perceived lack of desired control and lowered interest, expectations, persistence and strategic cognitive processing (e.g. memory, attention control, retrieval efficiency and coping; Pintrich & Schunk, 1996). To illustrate, anxiety is one of many factors that learners cognitively appraise when calibrating their self-efficacy. Similar associations between and negative effects of anxiety and low self-efficacy have been reported in PE (e.g. Ommundsen, 2004) and exercise settings (Gao, Xiang, Lee, & Harrison, 2008). For example, Lodewyk and Sullivan (2015) found that both self-efficacy and anxiety predicted favourable fitness outcomes in high school PE.

The path model and construct associations in this study are performed separately for males and females due to their consistent variations as a function of gender in PE, sport, and physical activity settings. For example, research in such contexts has generally reported lower physical activity and fitness levels in adolescent females than males (Dishman et al., 2005) and self-efficacy (Lodewyk & Sullivan, 2015); along with higher levels of anxiety (Lenskyj & Van Daalen, 2006) and personality traits like neuroticism (emotionality), extraversion, agreeableness, and conscientiousness particularly in sport settings (Allen et al., 2013). These differences may contribute to females’ more negative affiliations with PE in early adolescence (Dishman et al., 2005) and to their lower enrolment rates in optional PE (Faulkner et al., 2007) with correspondingly negative implications on their healthy-active lifestyles (Smith & St. Pierre, 2009).

**Objectives**

On this basis, there are four objectives for this study. First, in line with the research reported earlier (e.g. Allen et al., 2013; Lenskyj & Van Daalen, 2006; Lodewyk & Sullivan, 2015; Rhodes & Pfaefli, 2012; Rhodes & Smith, 2006; Wilson & Dishman, 2015), gender differences were anticipated in each of the variables. Females were expected to be lower in self-efficacy and...
intention to exercise and higher in anxiety and in the personality dimensions of emotionality, extraversion, agreeableness, and conscientiousness. Second, the fit of a proposed pathway (Figures 1 and 2) is expected among both males and females wherein the HEXACO trait personality dimensions and intentions to exercise relate indirectly through anxiety and self-efficacy. Third, personality (specifically conscientiousness and extraversion) is expected to predict both self-efficacy and intention for exercise. Finally, calls (e.g. Rhodes & Smith, 2006) for new research into relations between indices of motivation and achievement (anxiety, self-efficacy and intentions in this study) and the sub-scales of the personality dimensions lead us report their associations rather than to assert any hypotheses on them. For example, Rhodes and Pfaeffli (2012) assert that, there is evidence that in certain settings higher order personality traits like extraversion, conscientiousness and neuroticism moderate physical activity and that ‘some lower order traits may be better predictors of physical activity than higher order traits and may moderate motivation’ (p. 195).

Method

Participants and procedure
Data screening procedures using Mahalanobis distance values exceeding recommended levels ($\alpha^2 = .001$; Tabachnick & Fidell, 2006) warranted the deletion of three outliers cases resulting in a final sample of 316 students (155 females; 161 males) in grade 9 ($n = 173$) or 10 ($n = 143$) PE class. The sample represented four suburban independent high schools within one school district in the south-western district of the province of Ontario, Canada. Most of the participants were Caucasian (83%) and from middle-class socio-economic status. Each class was taught from the same grade 9 or 10 Physical and Health Education Ministry of Education curriculum. Following the attainment of ethical approvals from university, school board, principal, teachers, participants and respective parent/guardians, the lead investigator or a trained graduate assistant administered the surveys to assenting students that required about 20–25 min to complete. These surveys were administered during participants’ regularly scheduled PE class with a 90% rate of participation and collected data on other constructs that were beyond the scope of this study. Students who chose not to participate engaged in another curricular learning activity at the same time and location.

Measures
Students completed a questionnaire that asked them to report, among other things, their gender, ethnicity and intentions for future exercise participation using three items from Ajzen (1991). For the three items, ‘I intend’, ‘I will try’ and ‘I plan to’ preceded the stem ‘exercise regularly next month’. This measure has been used previously (e.g. McEachan, Sutton, & Myers, 2010) with sound indicators of reliability ($\alpha > .80$) and validity through its predictive relations to many motivational and affective constructs (e.g. self-efficacy and behavioural regulations). The measure of self-efficacy for performance in PE consisted of three of the four self-efficacy for performance items from the eight-item self-efficacy scale on the Motivated Strategies for Learning Questionnaire that has been used previously in PE settings (e.g. Lodewyk & Sullivan, 2015) and validated in a host of other contexts (Duncan & McKeachie, 2005). A sample item for each is: ‘I expect to do well in PE.’ Finally, anxiety in PE was assessed
using the three anxiety-related adjectives (anxious, nervous, and stressed) from the negative affect scale of the 20-item Positive and Negative Affect Schedule developed and validated by Watson, Clark, and Tellegen (1988). The intention to exercise and self-efficacy for performance items were scored on a seven-point Likert-type scale (1 = not at all true of me, 7 = very true of me), whereas the anxiety items used a five-point Likert scale (1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, 5 = all of the time). The internal consistency reliability coefficients for each of these measures in this study was .93 (intentions to exercise), .82 (anxiety in PE) and .88 (self-efficacy for performance in PE).

Trait personality was assessed through the six-dimension and 100-item (96 items for the purposes of this study) HEXACO Personality Inventory – Revised (HEXACO-PI-R; www.hexaco.org). This measure is commonly used to assess trait personality and has established validity in numerous settings, languages and age-levels (Lee & Ashton, 2004) such as satisfactory reliability coefficients (> .70) and statistical associations with several theorised outcomes (Ashton & Lee, 2007). A five-point Likert-type scale (1 = strongly disagree, 5 = strongly agree) is used for each item and scores for the six HEXACO personality dimensions are computed using the mean of 16 items for each. These 16 items for each dimension are further divided into four items for each of the four sub-scales within each (see Table 1 for a description and internal consistency reliability coefficients for each). These coefficients were satisfactory (> .72) for the dimensions and, with the exception of the sincerity, anxiety, gentleness, flexibility, aesthetic appreciation and unconventionality sub-scales, each of the sub-scales met the > .60 criterion for scales with less than 10 items (Loewenthal, 1996). Those six sub-scales with internal consistency coefficients below that level were omitted from the analyses of sub-scales in this study.

**Data analysis**

Statistical analyses were performed using the Statistical Programme for the Social Sciences (SPSS; version 22.0). Screening of variables for normality was performed followed by computing Cronbach’s alpha internal consistency reliability coefficients and Pearson bivariate correlation coefficients. Separate MANOVA procedures (p > .05) were used to assess gender differences in personality dimensions and in anxiety, self-efficacy and intentions. Analyses of the proposed pathway were performed through AMOS in SPSS using the maximum likelihood method for extraction. Finally, linear regression procedures were used to test the relative prediction of each personality dimension and sub-scale on self-efficacy and intention to exercise.

**Table 1. HEXACO personality dimensions and sub-scale internal consistency.**

<table>
<thead>
<tr>
<th>Honesty-humility (.79)</th>
<th>Emotionality (.76)</th>
<th>Extraversion (.83)</th>
<th>Agreeableness (.82)</th>
<th>Conscientiousness (.80)</th>
<th>Openness to experience (.72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sincerity (.44)</td>
<td>Fearfulness (.64)</td>
<td>Social Self Esteem (.67)</td>
<td>Forgiveness (.64)</td>
<td>Organisation (.64)</td>
<td>Aesthetic Appreciation (.58)</td>
</tr>
<tr>
<td>Fairness (.68)</td>
<td>Anxiety (.49)</td>
<td>Social Boldness (.72)</td>
<td>Gentleness (.58)</td>
<td>Diligence (.69)</td>
<td>Inquisitiveness (.63)</td>
</tr>
<tr>
<td>Greed-Avoidance (.74)</td>
<td>Dependence (.66)</td>
<td>Sociability (.68)</td>
<td>Flexibility (.56)</td>
<td>Perfectionism (.64)</td>
<td>Creativity (.71)</td>
</tr>
<tr>
<td>Modesty (.60)</td>
<td>Sentimentality (.69)</td>
<td>Liveliness (.68)</td>
<td>Patience (.75)</td>
<td>Prudence (.63)</td>
<td>Unconventionality (.29)</td>
</tr>
</tbody>
</table>

Note: Internal consistency = Cronbach’s alpha internal consistency reliability coefficients.
Results

Preliminary screening of the scales for normality of distributions and internal consistency reliability as recommended by Tabachnick and Fidell (2006) revealed no abnormalities (> .71) for personality dimensions or (> .81) for self-efficacy, anxiety and intentions. These and the descriptive statistics and correlations are provided in Table 2. Several of the sub-scales had lower than acceptable values (> .60 for scales with less than 10 items according to Loewenthal, 1996) so they (sincerity, anxiety, gentleness, flexibility, aesthetic appreciation and unconventional) were omitted from any subsequent analyses of sub-scales in this study. Analysis of the scale means revealed that, in both males and females, levels of openness to experience and anxiety were low (< 3.00) and self-efficacy and intentions to exercise were high (> 5.00). Males were also low (< 3.00) in emotionality. The MANOVA testing statistical differences in personality as a function of gender revealed a significant main effect \[ F (6, 306) = 19.98, \] p < .001, \( \eta^2 = .28 \] with females higher in honesty-humility, \( F (1, 311) = 9.23, \) p < .001, \( \eta^2 = .11 \] ; emotionality, \( F (1, 311) = 14.84, \) p < .001 \( \eta^2 = .19 \) ; and, conscientiousness, \( F (1, 311) = 15.75, \) p < .001, \( \eta^2 = .054 \). The MANOVA testing gender differences in anxiety, self-efficacy, and intentions also significant variations overall \[ F (3, 296) = 6.78, \] p < .001, \( \eta^2 = .064 \] and individually through higher levels of anxiety in females, \( F (1, 298) = 16.87, \) p < .001, \( \eta^2 = .054 \); and higher self-efficacy in males, \( F (1, 298) = 8.04, \) p = .005, \( \eta^2 = .026 \). No statistical gender difference was observed in intention to exercise (p = .91).

The path analyses assessing whether the gender-specific data fit the proposed path model revealed an excellent fit (Hu & Bentler, 1999) of the model to the data for both males and females. This interpretation was based on Browne and Cudeck’s (1993) standards of root mean square error of approximation (RMSEA) values of .10 or less, Hu and Bentler’s (1999) recommended values of standardised root mean residual (SRMR) of .08 or less and comparative fit indices (CFI) of .95 and greater; although, others (e.g. Byrne, 2008) have CFI values

<table>
<thead>
<tr>
<th>Table 2. Scale descriptive statistics and correlations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scales</td>
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<tr>
<td>--------</td>
</tr>
<tr>
<td>Alpha</td>
</tr>
<tr>
<td>Females</td>
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<td></td>
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<tr>
<td>Males</td>
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<th>Correlations by gender</th>
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<tr>
<td>H</td>
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<td>E</td>
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<td>X</td>
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<td>ANX</td>
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<tr>
<td>SE</td>
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<tr>
<td>IEX</td>
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</tbody>
</table>

Notes: N = 302; Females (n = 153, Lower Diagonal), Males (n = 149, Upper Diagonal). Alpha = Internal Consistency Reliability Coefficient; SD = Standard Deviation; H = Honesty-Humility, E = Emotionality; X = Extraversion, A = Agreeableness, C = Conscientiousness; O = Openness to Experience; ANX = Anxiety; SE = Self Efficacy; IEX = Intention to Exercise. *p < .05; **p < .01.
of .92 – .94 as an acceptable standard for excellent fit. The goodness of fit indices in this study were \(\chi^2_{13} = 16.97, \ p = .201; \ CFI = .977; \ SRMR = .033; \ RMSEA = .045\) for females (see Figure 1) and \(\chi^2_{13} = 29.51, \ p = .006; \ CFI = .920; \ SRMR = .050; \ RMSEA = .093\) for males (see Figure 2). The nonsignificant \(\chi^2\) value among the male data was also not deemed problematic since \(\chi^2\) for path analyses tends to be inflated mainly due to relatively large sample sizes (Tabachnick & Fidell, 2006). Significant \((p < .001)\) individual paths were evident in both males and females between extraversion and anxiety (inversely), anxiety and self-efficacy (inversely) and self-efficacy and intentions. There were also significant path relations between agreeableness and anxiety \((p = .005)\) and openness to experience and anxiety \((p < .001)\) only among females; whereas, the conscientiousness and anxiety relationship was significant \((p = .029)\) solely among males.

Regression analyses with each of the six personality dimensions entered simultaneously as predictors of self-efficacy and again as predictors of intentions were performed separately for males and females. The results revealed that personality predicted \((p < .05)\) self-efficacy and intentions in both males and females. Results for females were: \(R^2 = .20, F(6, 142) = 5.79, \ p < .001\) for self-efficacy; and, \(R^2 = .09, F(6, 142) = 2.30, \ p = .038\) for intention to exercise. Among males, the results were: \(R^2 = .21, F(6, 141) = 6.19, \ p < .001\) for self-efficacy; and, \(R^2 = .18, F(6, 141) = 5.07, \ p < .001\) for intention to exercise. Individual personality dimension predictors of self-efficacy among females were extraversion \((p < .001)\), conscientiousness \((p = .011)\) and openness to experience \((p = .019)\); whereas only extraversion \((p = .000)\) predicted self-efficacy among males. Extraversion predicted intention to exercise among both females \((p < .002)\) and males \((p = .001)\) with emotionality also predicting intention to exercise \((p = .016)\) among males.

The final objective of the study was to explore which of the sub-scales of the personality dimensions predicted anxiety, self-efficacy and intentions. To do so, regression analyses were performed entering as predictors only those sub-scales of the personality dimensions that statistically predicted anxiety, self-efficacy and/or intentions in the previous results. The results (see Table 3) revealed that the extraversion sub-scales were particularly poignant predictors among females as three inversely predicted anxiety \((p = .017)\); sociability, \(p = .007\); social self-esteem, \(p < .001\), two predicted self-efficacy \((p = .044)\); higher social self-esteem, \(p = .031\) and one predicted intention to exercise \((p = .05)\). Social self-esteem was also a consistent predictor of these variables in males as it predicted anxiety \((inversely; \ p < .001)\), self-efficacy \((p < .001)\) and intention to exercise \((p = .012)\). Other sub-scale predictors among females were the forgiveness sub-scale of agreeableness on anxiety \((inversely; \ p = .01)\) along with the prediction of self-efficacy by the diligence sub-scale of conscientious \((p = .001)\) and the creativity sub-scale of openness to experience \((inversely; \ p = .019)\). Other sub-scale predictors among males were the diligence sub-scale of conscientiousness on anxiety \((inversely; \ p = .002)\) and the fearfulness sub-scale of emotionality on intention to exercise \((inversely; \ p = .049)\).

**Discussion**

This study adds important insight into the potential role of trait personality on anxiety, self-efficacy and intentions to exercise as a function of gender in high school PE students. Analysis of the scale means revealed that both males and females reported generally favourable levels of anxiety, self-efficacy and intentions to exercise. The proposed pathway wherein
Table 3. Significant HEXACO predictors of outcomes in PE.

<table>
<thead>
<tr>
<th>Dimension or sub-scale</th>
<th>Anxiety</th>
<th>Self-efficacy</th>
<th>Intentions</th>
<th>Anxiety</th>
<th>Self-efficacy</th>
<th>Intentions</th>
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<tr>
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<td>β</td>
<td>T</td>
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<td>H</td>
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<td>-</td>
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<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Fearful</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>X</td>
<td>-35</td>
<td>-4.65***</td>
<td>30</td>
<td>3.89***</td>
<td>22</td>
<td>2.64**</td>
</tr>
<tr>
<td>SSE</td>
<td>-28</td>
<td>-3.66***</td>
<td>18</td>
<td>2.18*</td>
<td>34</td>
<td>2.85***</td>
</tr>
<tr>
<td>Sociable</td>
<td>-24</td>
<td>-2.75**</td>
<td>19</td>
<td>2.03*</td>
<td>23</td>
<td>2.43*</td>
</tr>
<tr>
<td>Lively</td>
<td>-21</td>
<td>-2.42*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>A</td>
<td>-21</td>
<td>-2.73**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Forgiving</td>
<td>-25</td>
<td>-2.62**</td>
<td>-</td>
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</tr>
<tr>
<td>C</td>
<td>-</td>
<td>-</td>
<td>20</td>
<td>2.58*</td>
<td>-</td>
<td>-18</td>
</tr>
<tr>
<td>Diligent</td>
<td>-</td>
<td>-</td>
<td>34</td>
<td>3.34***</td>
<td>-</td>
<td>-29</td>
</tr>
</tbody>
</table>

Notes: β values are standardised regression coefficients. H = Honesty; E = Emotionality; X = Extraversion; A = Agreeableness; C = Conscientiousness; O = Openness to Experience; SSE = Social Self-Esteem.

*p < .05; **p < .01; ***p < .001.
the HEXACO trait personality dimensions and intentions to exercise relate indirectly through anxiety and self-efficacy fit excellently among both males and females. More specifically, trait personality (notably lower extraversion regardless of gender, lower agreeableness and higher openness to experience in females and lower conscientiousness in males) predicted anxiety and anxiety predicted self-efficacy which predicted intentions to exercise. This supports the proposed interactive role of trait personality on intentions to exercise in both males and females, especially through its relationship with anxiety and self-efficacy. This supports previous research (e.g. Ajzen, 1991; Rhodes & Courneyea, 2003) signalling that variations in trait personality can serve as a cognitive filter affecting attitudes and beliefs like anxiety and self-efficacy and may have corresponding implications on behaviours such as exercise through students’ intentions. The path relations also may reflect the level of control students with such variations in personality, anxiety and self-efficacy sense (Rhodes & Smith, 2006) in PE. To illustrate, anxiety has been consistently associated with lower self-efficacy and both have been linked to several more negative outcomes (e.g. lower sense of control, interest, expectations, and persistence) in PE (Lodewyk & Sullivan, 2015; Ommundsen, 2004), exercise (Gao et al., 2008; Standage, Duda, & Ntoumanis, 2006) and classroom (Pintrich & Schunk, 1996) settings.

Since there was an excellent fit of the data to the model in both males and females, the influence of trait personality on intentions to exercise through relations with anxiety and self-efficacy in PE appears similar across gender at a more general (path) level. Such a finding aligns somewhat with related research (e.g. Lochbaum et al., 2010) indicating that gender does not have a moderating effect between personality and exercise. At a more fine-grained level, however, the role of gender in this study appears to support more of a gender-effect noted in other general movement settings such as sport (Allen et al., 2013) and physical activity (Rhodes & Smith, 2006). To illustrate, females in this study had higher levels of honesty-humility, emotionality, conscientiousness and anxiety, whereas males reported higher self-efficacy. Lower levels of self-efficacy and higher levels of anxiety in PE among females have been reported previously (e.g. Lodewyk & Sullivan, 2015) as having higher levels of honesty-humility (Lee & Ashton, 2004), emotionality (neuroticism) and conscientiousness in academic (Ackerman, 2013) and sport (Allen et al., 2013) settings.

This study also revealed some differences by gender in specific trait personality dimensions and sub-scale predictors of anxiety, self-efficacy and intentions (see Table 3). Trait personality collectively predicted anxiety, self-efficacy and intentions to exercise in both males and females. Trait personality predictors of anxiety were lower extraversion in both males and females (notably lower social self-esteem in both males and females along with lower liveliness and sociability in females), lower agreeableness (particularly lower forgiveness) and higher openness to experience in females and lower conscientiousness (especially diligence) in males. Trait personality predictors of self-efficacy in females were higher extraversion (notably sociability and higher social self-esteem) and conscientiousness (especially diligence) and lower openness to experience (particularly creativity). Only extraversion (particularly social self-esteem) predicted self-efficacy among males. Trait personality predictors of intention to exercise were extraversion in both females (especially sociability) and males and lower emotionality (and the fearfulness and social self-esteem sub-scales) in males.

It is clear from these results that extraversion was the most consistent dimension of trait personality to predict anxiety in PE, self-efficacy in PE, and intention to exercise in both males and females in this study. Previous research has also reported extraversion as a consistent
and prominent personality trait predictor of physical activity (Rhodes & Pfaeffli, 2012; Rhodes & Smith, 2006; Wilson & Dishman, 2015) and sport (Allen et al., 2013). The social self-esteem aspect of extraversion was a particularly consistent predictor of lower anxiety and higher self-efficacy and intentions to exercise in both males and females. In females, however, other extraversion sub-scales also predicted anxiety (liveliness and sociability), self-efficacy (sociability), and intention to exercise (sociability). Hence, social self-esteem (i.e. being satisfied with oneself and perceiving oneself as being likable, worthy, and popular) is predictive of these constructs in PE regardless of gender whereas being sociable (i.e. enjoying and engaging in social interactions and friendships) appears to be of some importance for lowered anxiety and higher self-efficacy in females.

This finding, along with the prediction of anxiety by lower agreeableness (notably forgiveness) and higher openness to experience and the prediction of self-efficacy by openness to experience among females not males in this study – may reflect what some scholars assert as an increased value and perceived reward for social dynamics among females in PE (Flintoff & Scratton, 2006) and in related contexts such as team sport settings (Jackson et al., 2011). Meanwhile, the importance of openness to experience has been shown in other physical activity (Rhodes & Smith, 2006; Stephan et al., 2014) and academic (Ackerman, 2013) settings; although it appears from this study that females who are more open to experience (i.e. creative and inquisitive) may be at increased risk for heightened anxiety and lowered self-efficacy in PE. It appears useful for high school physical educators to consider how, for example, the PE content and their teaching of it can be adapted to these individuals to increase their perceived need for creativity, novelty, innovation and critical thinking. For example, individuals high in extraversion and openness to experience to experience in classroom-based settings may benefit from more interactive learning (Komarraju & Karau, 2005).

The absence of emotionality as a predictor of the outcomes in this study beyond intention to exercise in males was unexpected since previous research (e.g. Lochbaum et al., 2010; Rhodes & Pfaeffli, 2012; Rhodes & Smith, 2006; Wilson & Dishman, 2015) has linked it along with extraversion and conscientiousness to favourable attitudes, sense of control and self-efficacy for physical activity and exercise. The effect of emotionality may emerge more in studies of other motivational constructs like goal orientation. For example, Lochbaum, Litchfield, Podlog, and Lutz (2013) reported that higher emotionality (less stability) was a mediator of performance-approach and avoidance goals on leisure-time exercise. Conscientiousness was also less of an expected predictor of the three outcomes in this study (it only predicted self-efficacy and females and lower anxiety in males) considering its consistent associations with physical activity (De Bruijn, De Groot, van den Putte, & Rhodes, 2009; Rhodes & Pfaeffli, 2012; Rhodes & Smith, 2006; Wilson & Dishman, 2015), mediating role on intentions for exercise and actual exercise behaviour (Chatzisarantis & Hagger, 2008; Rhodes & Pfaeffli, 2012), and motivation and achievement in academic (Ackerman, 2013; Komarraju & Karau, 2005) and sport settings particularly among females (Allen et al., 2013).

These results prompt a call for more research into trait personality in PE since the curricular domain of PE differs substantially from other movement-based settings (e.g. sport, exercise, and physical activity). For example, PE represents an educational domain that, while incorporating many important aspects of sport, exercise and physical activity, has many other curricular learning objectives reflective of physical literacy (e.g. Dudley, 2015) such as life skills, knowledge and a variety of movement activities (e.g. dance, educational games) that are performed in several different environments (e.g. air, water, snow/ice,
It would also be useful for future research to explore differences in associations between trait personality and similar motivational and achievement outcomes as a function of the general activity form (e.g. games, dance and fitness) in PE since individuals often participate in activities that align with their particular personality traits (Ashton, 2013). For example, participants in individual sports (e.g. tennis, golf) tend to be more conscientious and open to experience and less extraverted and emotional (Allen et al., 2013), whereas those who prefer rather team-oriented sports are more likely to be higher in agreeableness, conscientiousness and extraversion (Jackson et al., 2011). Knowing more about variations in trait personality as a function of motivational climate, pedagogical style and form of assessment would also be useful. More specifically, more knowledge is needed into the role of trait personality in rather competitive and comparative PE settings that tend to be associated with elevations in anxiety and decreases in feelings of control and self-efficacy particularly among more vulnerable students (Lodewyk & Sullivan, 2015; Ommundsen, 2004; Smith & St. Pierre, 2009). Finally, more insight is needed into how personality might influence intentions to exercise through other motivational constructs and theoretical models such as autonomous motivation in PE as part of the transcontextual model (Hagger & Chatzisarantis, 2016).

In conclusion, a concern in this study was the less than satisfactory (<.60) internal consistency reliability coefficients for 6 of the 24 trait personality sub-scales warranting their omission from the analyses of sub-scales in this study. Despite this, the study provides important insight to PE practitioners and researchers about interactions between trait personality and anxiety, self-efficacy and intentions to exercise as a function of gender in high school PE. The gender differences noted in this study are no impetus for segregated PE classes by gender in grade 9 and 10; rather, the study illuminates how educators may need to better account for how personality and its relationship to self-efficacy, anxiety and intentions to exercise varies somewhat as a function of gender in some PE settings. Trait personality (particularly the social self-esteem aspect of extraversion) predicted lower anxiety and higher self-efficacy, and intentions to exercise in both females and males. Openness to experience was predictive of both anxiety and lowered self-efficacy in females and emotionality and agreeableness were less than expected predictors relative to research in physical activity and sport. Future research needs to confirm these results that appear to signal that students who are less extraverted (more shy, passive, and reserved) and females who are more open to experience (intellectual, creative, unconventional, innovative, and inquisitive) may be more at risk for anxiety and lower self-efficacy in PE that may compromise their intentions to exercise. It may be most useful if physical educators forego the completion of any formal assessments of students’ trait personality dimensions in favour of becoming more informed about the nature of those dimensions. Such increased understanding may better equip them to be able to recognise students’ trait personality dimensions that might be linked to increased anxiety and reduced self-efficacy and intentions to exercise in PE and to differentiate instruction accordingly.

**Disclosure statement**

No potential conflict of interest was reported by the author.
References


