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Influence of Academic Discipline and Activity-Based Learning on Big Five Personality Traits: A Comparative Study of Physical Education and Non-Physical Education Students

¹Akshay Kumar, ²Dr. Surishtha Devi, ³Sumit Kumar and ⁴Diksha Sharma
^{1,3,4}Research Scholar, Department of Physical Education, Himachal Pradesh University,
Summerhill, Shimla (H.P.)
²Assistant Professor, Department of Physical Education, MCM DAV College Kangra
(H.P.).

Abstract – This paper surveys the role of academic discipline with respect to personality traits of the Big Five model, which are extraversion, agreeableness, conscientiousness, neuroticism and openness, which are influenced by the personal disposition as well as the learning surroundings. Physical education (PE) provides a body-in-action learning environment that can lead to different personality characteristics than other, more sedentary academic programs. The authors of this paper investigate the variations of the Big Five personal traits in PE and non-PE students at undergraduate and postgraduate levels. A multi-stage sampling process was used with 120 total participants (an equal number of female and male in each of the academic levels). BFI-Big Five Inventory (John & Srivastava, 1999) was used and group differences were determined with the help of independent t-tests in SPSS 27. The findings show that male PE students at both academic levels recorded higher scores on extraversion and conscientiousness and higher neuroticism at the undergraduate level. The results demonstrated that females are more conscientious at postgraduate PE and neurotic at undergraduate PE than their non-PE counterparts. This evidence leads to the argument that lifetime participation in structured, physical and socially mediated affairs might not only focus on the point of attracting individuals with specific traits of personality but also help them acquire self-control, social sensitivity and friendliness. The polarities suggest the inclusion of structured activity-based elements in learning plans to promote desirable personalities. Research in the future needs to consider the causal mechanisms, cross-cultural situations and long-term tendency of personality change across various educational contexts.

Keywords – Big Five Personality Traits, Physical Education Students, Academic Discipline and Personality, Activity-Based Learning, Comparative Personality Study, Undergraduate and Postgraduate Students. Personality Development in Education.

1. INTRODUCTION

Personality, often conceptualised through the Big Five framework of neuroticism, extraversion, openness, agreeableness and conscientiousness, influences how students think, learn and act. The growing body of literature demonstrates that the type of educational environment not only shapes, but also attracts specific dispositional profiles. Therefore, comparing personality traits across various fields provides a valuable insight into student development and their alignment with their environment. In no other discipline is this dance more apparent than in physical education (PE), in which coursework is itself embodied and social

and where individual differences can be directly translated into instructional strategy, philosophy of coaching and lifelong practice of physical activity.

Since the previous decade, an extraordinary accumulation of evidence suggests a specific trait constellation within the population of physical education majors. Large cross-sectional samples of European undergraduates indicate that physical education students tend to be highly extraverted and conscientious, while scoring low on neuroticism compared to their peers in sedentary disciplines such as humanities or engineering (Kuśnierz et al., 2020; Schmidt & Kruger, 2023). These dispositional advantages are not only descriptive: lower neuroticism and more conscientiousness, better intrinsic motivation and consequently a better GPA were found in the analysed Polish-Ukrainian cohort; the relationships held even after adjusting for gender and year of study (Kuśnierz et al., 2020). The long-term monitoring of activities such as sport has also demonstrated that a high and stable level of activity explains variation in personality across time, with greater baseline physical activity associated with stronger stability in extraversion and conscientiousness, as well as a reduction in neuroticism over time from three multi-decade samples on average (Sutin et al., 2018). The same findings are confirmed when the relative importance of competitive sport is studied in a meta-analysis, with extraversion and conscientiousness being positively associated to better athletic endeavours, while neuroticism has a weak negative association (Yang et al., 2024; Piepiora & Naczyńska, 2023).

Academic majors exhibit differences that go beyond the simple dichotomy of physical versus non-physical education. Studies of latent-profile analysis indicated that when considering a unique profile of personality structures, STEM, social science and arts students can be grouped into distinct personality structures that hold consistency across the universities without randomness; thus, the culture of disciplines self-identifies and fosters specific attributes (Kokkinos, Antoniadou & Voulgaridou, 2024). These tendencies are supported by the Indian and Ghanaian research of the same nature, as their results show that education and business versus art majors vary considerably in terms of openness, conscientiousness and agreeableness (Mishra, 2016; Opoku et al., 2023). Even in courses related to sport, such as a degree in it, specialisations (e.g., coaching or physiotherapy) can align with more latent dispositions (Sethi & Mehta, 2020).

Nevertheless, relatively few comparative studies explore the use of physical education majors in the context in which it is the only activity in comparison to a wide variety of other majors to employ gender balance, participation in competitive sport and academic motivation. Even the existing literature is based on single-country samples or a sample composed purely of varsity athletes and non-athletes (Rezaei Talyabee et al., 2013). Furthermore, there has been limited use of theoretical paradigms that combine personality with self-determination theory and achievement-goal paradigms to integrate multiple majors into a single study. It follows that an accurate understanding of the differences in trait profiles across college degrees may be used to optimise or customise mentoring, curricular development and mental health services.

2. METHOD AND MATERIAL

We used a multi-stage sampling technique to determine the relevant sample size. In the first step, five departments out of a total of 27 departments were randomly picked and as soon as the list of the students was prepared, the systematic random sampling method was used to select sample P.G. students. The convenience sampling method was used to select the undergraduate students and a local college was identified and used to sample the subjects. The sample size will be 120 students, comprising 60 postgraduate (60 male, 30 female) and 60 undergraduate (30 male and 30 female). To measure the personality traits, the Big Five Inventory (BFI) developed by John and Srivastava in the year 1999 was used. To analyse the data, SPSS 27 will be used for independent t-tests.

2.1 RESULT

Table 2.1: presents a comparative analysis of Personality traits between Male Physical Education Students and Other Discipline Students of Post Graduation

Variables	Physical Education Students (N=20)		Other Discipline Students (N=20)		t- ratio
	Mean	S.D.	Mean	S.D.	
Extraversion	27.35	4.24	24.63	7.80	3.35**
Agreeableness	30.16	8.36	30.47	6.59	0.35
Conscientiousness	27.55	3.91	25.55	14.15	2.08*
Neuroticism	24.44	8.02	23.78	19.62	0.54
Openness	37.16	19.20	32.85	22.24	2.92**
Total Personality	146.5	60.62	137.53	72.04	3.35**

*Significant at .05 level (t=2.02), **Significant at .01 level (t=2.70), df =38

The comparison made between male physical education students and their study mates in other fields at the postgraduate level indicates some personality markers that are quite different. The students of physical education are more extraverted, conscientious and open and show higher scores of the whole phenomenon; the difference was statistically significant. It implies that they are usually more socially active, disciplined and ready to experience other things in comparison to students undertaking other academic disciplines. However, regarding the characteristics of agreeableness and neuroticism, no substantial difference was found between the two groups, indicating similarities in their cooperative behaviours and emotional stability. Generally, the results mark different personality trends related to physical education training relative to other courses.

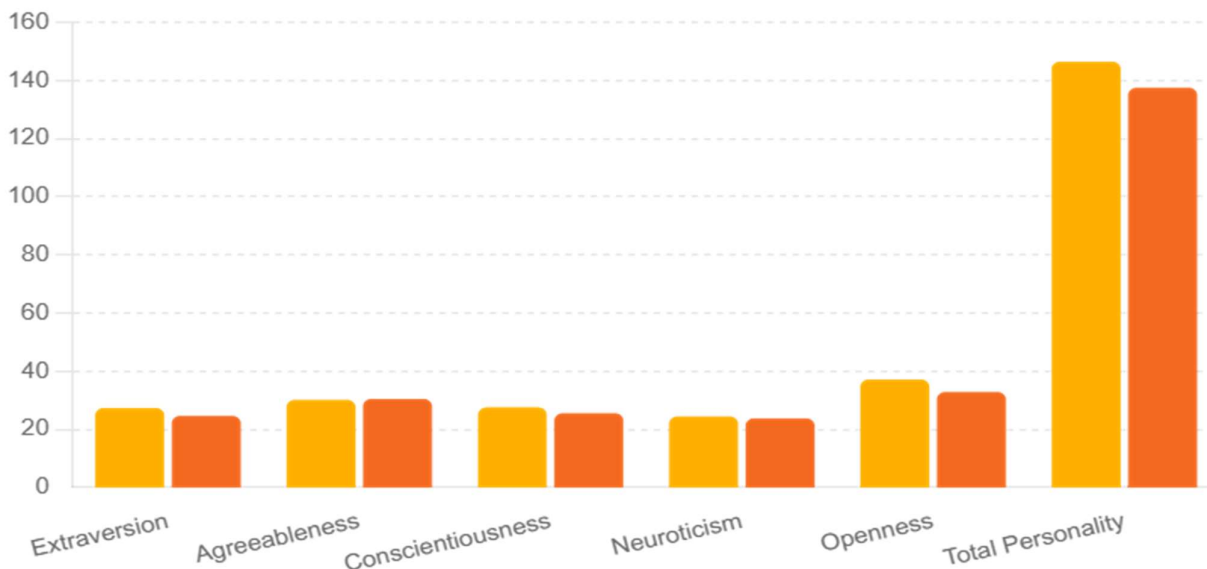


Figure 1 shows the mean values of personality traits for male physical education students compared to those in other disciplines at the postgraduate level.

Table 2.2 presents a comparative analysis of personality traits between male students from physical education and male students from other disciplines in undergraduate programs.

Variables	Physical Education Students (N=20)		Non-Physical Education Students (N=20)		t- ratio
	Mean	S.D.	Mean	S.D.	
Extraversion	25.55	4.97	23.75	9.46	2.08*
Agreeableness	26.55	8.26	27.84	7.58	1.38
Conscientiousness	28.17	7.91	25.68	4.12	3.06**
Neuroticism	25.66	9.176	23.42	7.59	2.35*
Openness	32.44	8.26	31.79	6.06	0.74
Total Personality	138.39	40.96	132.45	30.79	3.04**

*Significant at .05 level (t=2.02), **Significant at .01 level (t=2.70), df =38

The comparison of physical education males and non-physical education students at the undergraduate level depicts significant differences in a number of personality traits. There is much greater extraversion, conscientiousness and neuroticism, as well as overall personality scores, in the physical education students, showing that the former students are on the whole more outgoing, disciplined and emotionally reactive, as well as have stronger overall personality traits, than the rest of the non-physical education students. Conversely, both groups do not differ by much, or not at all, in terms of agreeableness and openness, indicating more or less the same levels of cooperativeness and openness to innovative ideas. These results show a correlation between certain personality peculiarities and involvement in physical education during undergraduate studies.

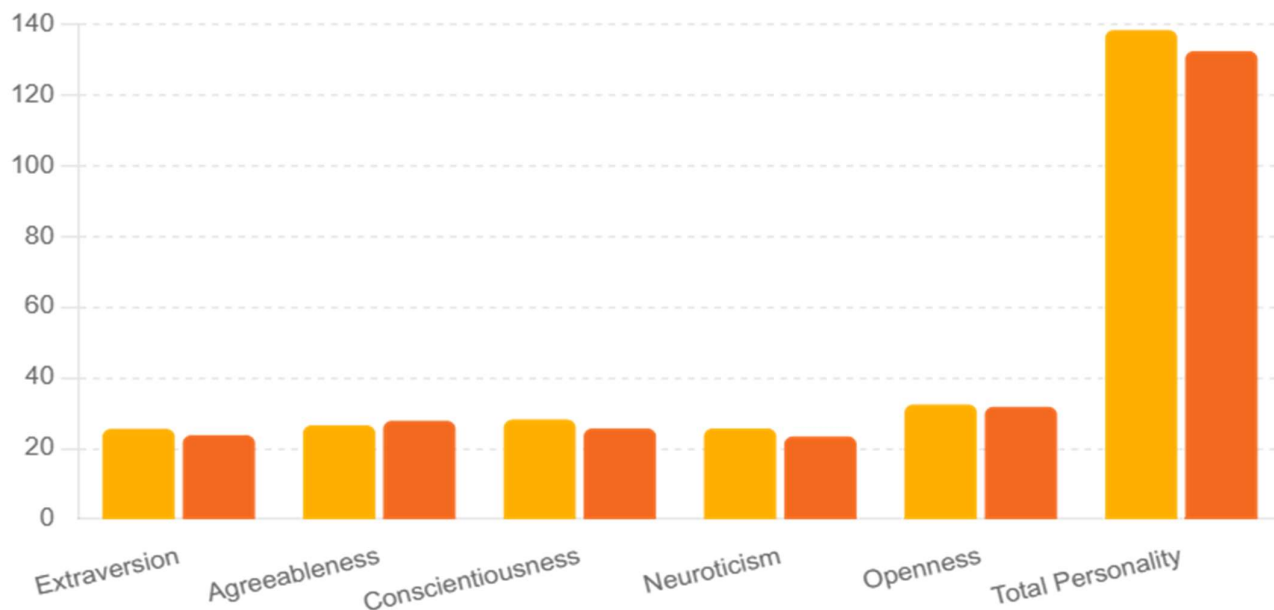


Figure 2 shows the mean values of personality traits for male physical education students compared to those in other disciplines at the undergraduate level.

Table 2.3: presents a comparative analysis of personality traits between female physical education students and other discipline students’ post-graduation

Variables	Physical Education Students (N=20)		Non-Physical Education Students (N=20)		t- ratio
	Mean	S.D.	Mean	S.D.	
Extraversion	25.53	15.26	25.36	9.35	0.14
Agreeableness	29.95	5.10	30.89	4.43	1.35
Conscientiousness	28.9	11.46	25.35	12.76	3.22**
Neuroticism	24.55	14.99	23.45	6.89	1.05
Openness	39.2	707.5	33.9	6.83	0.89
Total Personality	142.2	54.37	138.55	61.52	1.52

*Significant at .05 level (t=2.02), **Significant at .01 level (t=2.70), df =38

The comparison between the male physical education students and the students in other fields at the postgraduate level suggests that the significant difference happens only in the trait of conscientiousness, where the female physical education students are characterised as having higher levels of responsibility, self-discipline and goal orientation. The researchers did not identify a statistically significant difference in other traits, such as extraversion, agreeableness, neuroticism, openness and total personality scores, indicating that both groups tend to behave similarly in these areas. In sum, these findings indicate that academic discipline might not have much effect on the majority of personality traits of the female population at the postgraduate level, but training in physical education could be related to increased levels of conscientiousness.

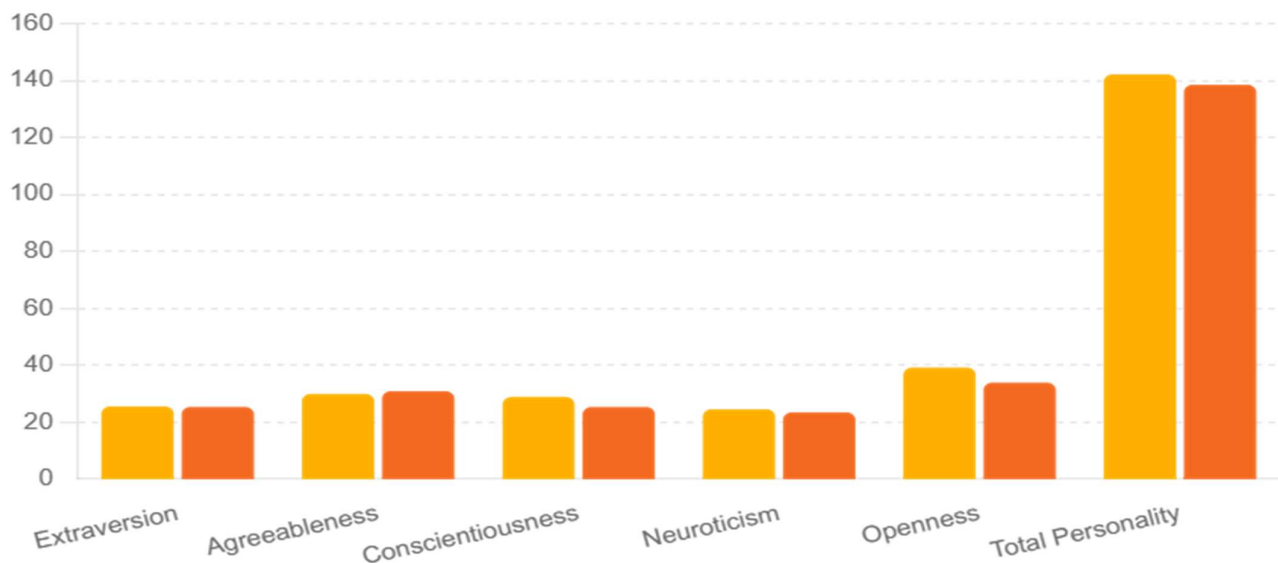


Figure 3 shows the mean value Personality Traits between Female Physical Education Students and Other Discipline Students of Post Graduation

Table 1.4: presents a comparative analysis of Personality traits between Female Physical Education Students and Other Discipline Students of Under Graduation

Variables	Physical Education Students (N=20)		Non-Physical Education Students (N=20)		t- ratio
	Mean	S.D.	Mean	S.D.	
Extraversion	24.85	6.45	25.75	7.04	1.09
Agreeableness	27.35	5.61	27.32	13.29	0.21
Conscientiousness	28	8.10	26.8	11.22	1.22
Neuroticism	26.9	5.25	25.15	8.98	2.07*
Openness	32.4	7.2	30.8	6.69	1.91
Total Personality	138.3	25.38	137.25	37.67	0.59

*Significant at .05 level (t=2.02), **Significant at .01 level (t=2.70), df =38

The comparison of female students of physical education and non-physical education students at the undergraduate level demonstrates that only one of the traits stands out as significantly different between the two groups, which is in the case of neuroticism. The results of physical education female students showed more representability with this trait, denoting that the female student might be slightly higher in emotionality or responsive in nature than others who belong to other fields. In other traits like extraversion, agreeableness, conscientiousness and openness, everyone did not make a statistically significant difference, implying that these characteristics of personality are more or less the same despite the academic discipline. On balance, the results indicate that the distribution of personality uniformities was put to minimum differences between the two groups, with gender respondents commanding a slight inclination towards emotional responsiveness among the female students in physical education.

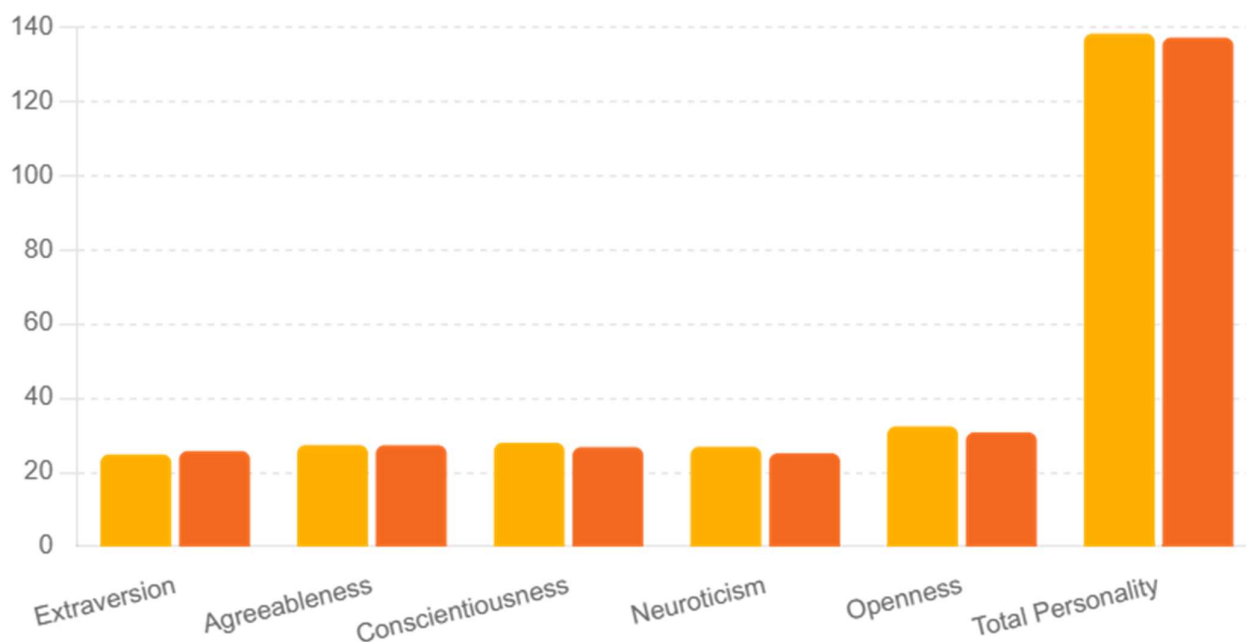


Figure 4 shows the mean value Personality Traits between Female Physical Education Students and Other Discipline Students of Under Graduation

3. DISCUSSION

The examination of personality traits among physical education students and those from other disciplines across both genders and academic levels reveals distinct trends. Physical education students scored significantly higher on extraversion, openness and total personality compared to other male postgraduates. Additionally, they exhibited much higher conscientiousness in the same category. In contrast, undergraduates showed much higher levels of extraversion, conscientiousness, neuroticism and total personality, resulting in a broader spectrum of differences. In the female postgraduates, the only trait that was significantly more prominent was conscientiousness and those characteristics implied more responsibilities and self-control in the female postgraduates, as compared to neuroticism that was found to be significantly more in the undergraduate level, which implied a slightly more emotional individual. Male PE students would have higher extraversion than sociability and assertiveness, as males were more socially and assertive than physically active groups, as reported by other researchers (Kuushnierz et al., 2020; Schmidt & Kruger, 2023). On the same note, greater conscientiousness among male and female learners in PE at some educational levels suggests a relationship between enhanced physical activities, self-control and goal-oriented behaviour (Sutin et al., 2018). This, however, provides an explanation as to why neuroticism would be identified as higher among students pursuing the PE undergraduate field than people not studying in this field, as the performance demands and competition rate are especially high at this stage of the academic development, along with the transitional stressors that individuals face at this age (Piepiora & Naczyńska, 2023). The developmental stage and sociocultural expectations are possible moderators of the influence of activity-based learning on personality, as indicated by gender-specific patterns here. Although considerations of the male PE students reveal clear advantages in terms of their regular social and self-regulatory choices, the female students in PE are seen to be more selective on the trait level, showing higher associations with conscientiousness emerging on the postgraduate level. This variation may be attributed to the heightening of academic responsibility and the training of a student studying advanced degrees. Naturally and practically speaking, the findings also point to the possibility of implementing more comprehensive education programs with a focus on incorporating structured physical and collaborative activities to instill desirable traits like sociability, self-control and openness to experience. Meanwhile, some groups of people are highly neurotic, which is why it is necessary to consider a balance between the high competition-performance expectations and psychological support measures. Future studies are needed to further document longitudinal designs to identify the causal pathways of academic discipline and activity-based learning and personality changes with time, as well as cultural dimensions and the importance of previous athletic experience. This work aims to clarify whether the differences observed are due to self-selection for PE programs or the influence of the PE learning environment on developmental outcomes.

4. CONCLUSION

As the study at hand shows, both academic discipline and gender influence the personality profile of the university students in the most subtle manner. At both the undergraduate and postgraduate levels, students in male physical education (PE) classes scored higher than their non-PE class counterparts on extraversion and conscientiousness, which are aspects of characteristics of high social ability, aggressiveness and self-control. The similar levels of neuroticism observed in the male PE undergraduate demographic suggest that excessive participation in physical training may contribute to increased emotional or stress reactivity during early adulthood. In contrast, female PE students differed from female non-PE students in a more limited manner: at the postgraduate level, females in PE demonstrated significantly higher conscientiousness (indicating greater goal orientation and self-control), while at the undergraduate level, they reported slightly elevated neuroticism and neurological sensitivity. Such trends agree with longitudinal research that high-moderate-to-vigorous physical exercise promotes extraversion and conscientiousness and decreases neuroticism over the long term, with cross-sectional reports showing greater social engagement and

discipline in athletes and PE majors. The larger implication is that socially interactive curricula that are embodied do not just appeal to student populations who happen to have certain dispositional strengths; the present alignment of embedded social interaction also actively develops characteristics or traits, namely conscientiousness and extraversion, that are more likely to promote academic achievement, coachability and the adoption of healthy lifestyle behaviours throughout the entire lifetime. Zap claims, however, that there are gender- and level-dependent differences: Boys overall seem to benefit from PE exercise in regard to physical development while girls appear to derive benefits from a personality perspective. Additionally, undergraduate students' temporary emotional turbulence suggests avoiding a universal interpretation.

In this context, educators and curriculum designers should consider incorporating a structured, activity-based component across various disciplines to encourage positive personality development; therefore, interventions must be tailored to gender and developmental stage. The next studies will also need to separate the pathways through which physical education results in changes to dispositional development, referring to larger, more diverse samples and longitudinal designs in future studies.

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