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Testing Physical Activity Level as Determinant of Procrastination in Exercise: Will This Direction Work?

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Abstract:
China has witnessed massive economic development in the past few decades and one of the consequences of increased urbanization has been the reduction of physical activity in the adult population. In light of this trend, the researcher has conducted this study with the aim of examining how the low physical activity levels lead to exercise procrastination in the longer run by looking at data collected from Chinese adults that have at least a year or so experience of athletics of any type. The variables that were studied for this purpose in this research include the low level of physical activity as the independent variable, exercise procrastination as dependent and three mediating variable i.e. Low level of perceived self-efficacy in the athletes, perceived task difficulty in the athletes and negative affectivity in the athletes. The researcher conducted an in-depth literature review that led to the formation of 4 hypotheses for direct and indirect relationships. The researcher used positivism to conduct this quantitative research. The nature of research is exploratory with the random sampling technique used to conduct the survey. . Moreover, data is collected through an online questionnaire. The collected data was used to test the hypotheses through statistical and analytical procedures using SPSS. Various tests were applied including descriptive tests, KMO tests, CFA and SEM. The results of SEM showed that the direct impact of low physical activity was insignificant on exercise procrastination. As for the indirect effects, the mediation of negative affect and low self-efficacy were significant while that of perceived task difficulty was insignificant. In addition, the researcher has presented the limitations as well as the future directions that can be adopted in future researches.
Keywords: self-efficacy, perceived task difficulty, negative affectivity, exercise procrastination, physical activity, China.

Introduction

There is a global increase in the realization of the importance of sports and physical activity for physical health and appearance (van Uffelen, Khan, & Burton, 2017). The fitness industry has also witnessed a boom in China in the recent years with increased urbanization and economic development in the country (F. Li, 2016). Development of technology and a changed consumer lifestyle have transformed the fitness industry and instead of exercising in the gyms only, people can now install portable machines at home or use fitness applications and follow the instructions available (Huang & Ren, 2020; Wei, Vinnikova, Lu, & Xu, 2020). However, despite the evident benefits of this economic prosperity in China and the linked development of the health and fitness industry that have brought about advancements like an improved quality of life and an increase length of life (F. Li, 2016), about only 50% of the population can be termed as having the required physical activity levels that are described by World Health Organization, as shown in Table 1 below. Of these people, only 0.8% of the total population is involved in fitness related physical activities, 7.1% of the Chinese population is involved in mindful movement and 43.5% is involved in sporting activities, as shown in Figure 1 given below.

Table 1: WHO Guidelines for Physical Activity

Children (5 - 18 years)	**60 minutes of physical activity per day**
Adults (19 - 64 years)	150 minutes of moderate aerobics per week at the minimum
Adults (65+ years)	150 minutes of moderate aerobics per week plus strength exercises twice a week

Source: (World Health Organization, 2020)

Regular physical activity has many health benefits and leads to a reduction in the risk of contracting chronic diseases of the heart and other diseases like Type 2 diabetes, some kinds of cancers, lung-related diseases and hypertension (REF). Despite this, according to the above given statistics, nearly 49% of the Chinese population does not indulge in the required amount of physical activity level. In athletes that have been out of practice for some time, either due to an injury or in conditions like the Covid-19

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pandemic, it is important to find some way of keeping active and engaged in required physical activity levels so that they can stay healthy and agile (REFS). However, maintaining activity levels requires a high level of self-regulatory behavior driven by self-efficacy in terms of having the ability to achieve the goals and fitness levels that have been set up (Mann et al., 2013). Recent studies have highlighted that procrastination is one of the factors that lead to failure of self-regulation, especially in the case of health oriented behavior (Kroese and De Ridder, 2016). Other factors like task difficulty perceptions and negative affectivity can also lead to an increase in procrastinating behavior (Refs).

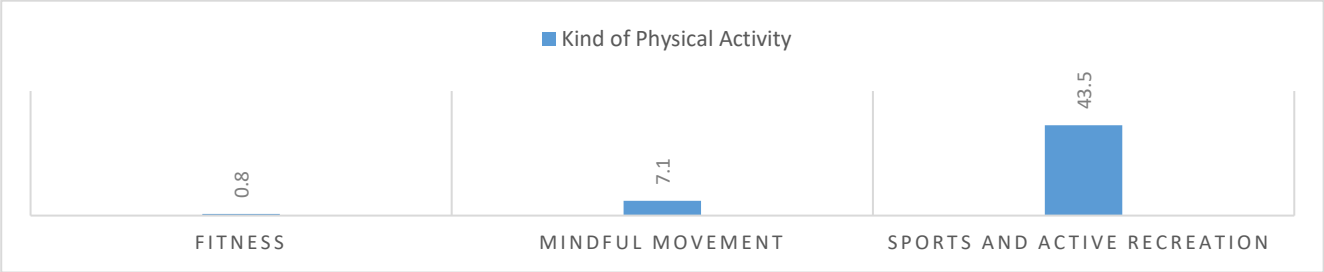

Figure 1: Participation rate of physical activities in China
Source: statista.com

In light of the significant changes in China over the past few decades that have led to health-related demographic changes, it is vital to understand how lower levels of physical activity levels have led to an increased culturing of exercise procrastination in the people as they are the population portion that can be easily changed to having a high physical activity level.. Moreover, understanding this behavior in athletes is even more useful procrastination. Moreover, these studies have helped in designing strategies for practitioners and policy makers in terms of reducing procrastination behavior in various contexts.

Such a study would be beneficial in terms of other countries as it is capable of being generalized to country-contexts with similar demographics. In the past, physical activity level studies have been conducted for either aging population (REF) or for children and adolescents (REF) in China; however, there is lack of literature focusing on adults and especially in terms of athletic adults. In light of the above-mentioned problem area and gaps, the primary objective of this study is defined as "investigating the impact of low physical activity on the exercise procrastination". Secondary objectives include investigating the mediating impact of lower self-efficacy of the athletes, the perceptions of the task difficulty and negative affect between low physical activity and exercise procrastination. These objectives have led to the formation of the following research questions for this study:

- How does low physical activity impact the exercise procrastination in athletes?
- To what extent can low self-efficacy in athletes mediate the relationship between their low physical activity and exercise procrastination?
- To what extent can the perceived task difficulty by the athletes mediate the relationship between their low physical activity and exercise procrastination?
- To what extent can negative affect in athletes mediate the relationship between their low physical activity and exercise procrastination?

The scope of this study is to consider how athletes in China fall prey to exercise procrastination when their physical activity levels are low and when they are faced with low self-efficacy, negative affectivity and the high level of perceived task difficulty. Several past studies have explored the issues of exercise procrastination or avoidance (REFS) with beneficial implications for theory, practice and policy. While some of these studies have explored the theories of procrastination, others have highlighted the role that low self-efficacy or task difficulty has in performance and The rest of this paper comprises four parts; literature review, methodology, results and analysis, and discussion and conclusion.

In the section on literature review, the researcher has presented a theoretical background and a recent research-based review in this area. The methodology outlines the choices of the researcher regarding the research design and process followed by the hypothesis testing and analysis of findings in the next part. The last portion, discussion and conclusion, highlights the key findings, limitations and future implications of from this study.

Literature Review

Theoretical Background

Many researchers have put in efforts to account for human psychological factors that explain the phenomenon of procrastination; however, there are five theories that are particularly prominent in this regard i.e. psychoanalytic, psychodynamic, behavioral, cognitive and Temporal Motivation Theory (TMT). Freud explained the concept of procrastination as the fact that tasks that are not completed are seen as an egoistic threat and hence avoided (Ferrari, Johnson, & McCown, 1995), laying the ground for the psychoanalytic theory. The procrastinator is believed to have a difficulty in imagining a future in this theory (Blatt & Quinlan, 1967). As for the psychodynamic theorists, they believed that the personality traits like task avoidance and procrastination are linked to the problems of childhood and issues in parenting styles (Ferrari et

al., 1995). As per the behavior theory, reinforcement has been the most evident driver of behaviors like procrastination (Ainslie, 1975). Some aspects of this theory include avoiding of unpleasant stimulus, escape conditioning, task incompletion and avoidance conditioning. The cognitive approach is a newer concept and it explains that three things, either in combination or separately, lead to procrastination which are, a sensitive sell-esteem, indecisiveness and irrational beliefs (Ferrari et al., 1995). The last theory, TMT explains the decision-making process by highlighting that activities or decisions are always prioritized in terms of highest utility i.e. a person tends to procrastinate if low utility is perceived (Turenne & Pomerol, 2013). Of all these theories, TMT is the most suitable as it collectively assembles all other concepts in itself and explains the phenomenon of procrastination in terms of four components i.e. expectancy, valence, sensitivity, and delay.

Low Physical Activity and Exercise Procrastination

Healthy activities like getting the required amount of exercising, eating healthy and sleeping well are important for an individual's health as failing to do so can lead to deteriorating health in the long term (Kroese & de Ridder, 2016). Sirois (2016) discussed the Procrastination-Health Model which suggests that procrastination can impact the health of a person both directly as it produces stress and indirectly by delaying behavior that can help in promoting good health. This study shows that the effects of procrastination for health are seen in outcomes like reduction in healthy activities; however, there is a lack of clear evidence in this regard. Kroese and de Ridder (2016) have also highlighted that the links between procrastination in the regulation of healthy activities, such as exercising is not explored in literature. One reason for obtaining unclear results in this regard is the fact that general procrastination is studied instead of domain-oriented procrastination.

Exercise is prone to procrastination as it is usually seen as an aversive physical activity. Exercise procrastination, which can be defined as intended or purposive delaying in intended exercising was introduced in research by Kelly and Walton (2020) who found a positive correlation between exercise-related procrastination and procrastinating behavior in general. Moreover, a link to low physical activity was also indicated in this study. Codina, Pestana, Valenzuela, and Giménez (2020) explored the role played by physical activity in determining levels of procrastination and found that people spending more time engaged in physical activity reported lesser procrastination behavior. Other researchers have also linked spending more time on performing an activity and a reduction of procrastination against it (Pestana, Codina, & Valenzuela, 2020; Steel, Svartdal, Thundiyil, & Brothen, 2018). Therefore, it can be indicated that if spending reduced time on physical activities can make someone procrastinate more about the task, leading to avoidance behavior.

In light of the above, the following hypothesis is proposed:

H1: The low physical activity of the athletes has a significant impact on exercise procrastination.

Mediating Role of Lower Self-Efficacy of the Athlete

The theory of self-efficacy studies the belief of a person about themselves and their ability to perform a particular task as factors influencing task choice, effort, persistence and performance (Sehgal, Nambudiri, & Mishra Sushanta, 2017). In the presence of adequate ability levels, the level of motivation to perform a task are higher and the overall orientation and tackling process of any task depends on these factors. Weak self-efficacy can be linked to procrastination or avoidance behavior whereas stronger self-efficacy is linked to an increase in task take-up and persistence behavior (Przepiórka, Błachnio, & Siu, 2019). In many past studies such as Hajloo (2014), strong self-efficacy has been linked to have a lowering impact on procrastination. Yerdelen, McCaffrey, and Klassen (2016) have also linked low self-efficacy levels to an increase in the ratio of task-related anxiety and procrastination. Zelle et al. (2016) examined how a lack of movement after surgery can lead to lower physical activity and reduction in the self-efficacy related to such activities. Moreover, this lower self-efficacy was also linked to further decrease in physical exercises.

H2: There is a mediating role of the low self-efficacy of athletes on the relationship between low physical activity and the exercise procrastination in athletes.

Mediating Role of Perceived Task Difficulty for Athlete

Perceived task difficulty can be explained as in terms of beliefs regarding the amount of effort that is needed in order to complete a task successfully. It also includes the perceptions of reading the likelihood of success in the task performance and the probability of completion (Codina et al., 2020). These perceptions are inclusive of both the self-efficacy levels of the preceptor and the external situation in question. Moreover, task difficulty perceptions are also guided by the intentions of the person to engage in a task or avoid it (Kelly & Walton, 2020). Benoit et al. (2019) found that the tasks that are demanding can lead the performer to feeling stressed out and showing an avoidance behavior towards the task. Moreover, it is found that prolonged engagement in demanding tasks can lead to fatigue, exhaustive feeling and performance deterioration in the long term. Nair (2017) also mentioned in their study that there is a tendency of leaving difficult tasks and increased procrastination and avoidance behavior in tasks that are considered as difficult. In light of the TMT theory, it is suggested that perceived task difficulty can lead to increasing the impact of lowered physical activity, as it involves a reduction in skills and ability as well as confidence in oneself, and lead to increasing the procrastination related to tasks. This has led to the development of the following hypothesis;

H3: There is a mediating role of perceived task difficulty for athletes on the relationship between low physical activity and the exercise procrastination in athletes.

Mediating Role of Negative Affect of the Athlete

There are two kinds of affective responses to events like stress; positive stressors yield positive affectivity and negative stressors yield negative affectivity(Busseri, 2018). The positive affect can be explained as impacts like the enthusiasm, alertness and activeness of the athletes that can lead to feelings of satisfaction and a boost in energy(Moen, Myhre, Klöckner, Gausen, & Sandbakk, 2017). Negative affect refers to the feelings of stress, lethargy, fear, anger, nervousness and other such negative emotions of the athlete (Moen et al., 2017). Thus, it is evident that each kind of affectivity will have a different kind of load for the athletes. Moreover, highly demanding and strenuous exercises can cause negative affect as they can create physical and emotional stress for the athletes. In addition to such inert emotions, external tragic experiences like an injury can leave a negative affective response on the athlete and can increase their chances of not returning to sports i.e. procrastination (Ivarsson, Tranaeus, Johnson, & Stenling, 2017). It is noted that injuries in sports are a major cause of reduced participatory intentions and an increase in avoidance behavior (Pestana et al., 2020) and can have many negative impacts on an athletic career.

In light of these studies, it can be predicted that having negative emotional and affective perceptions regarding exercise can mediate the impact of lower physical activity on the level of exercise procrastination. Thus, it can be hypothesized in this study that;

H4: There is a mediating role of the negative affect of athlete on the relationship between low physical activity and exercise procrastination in athletes.

Research Summary

The literature review presented above is summarized to clarify research-specific findings in Table 2 below.

Table 2: Literature Summary

Author	Main Contribution	Gap
Kroese and de Ridder (2016)	Maps a link between intention and procrastination behaviors in health-procrastination link.	The scope of the study does not cover exercise procrastination specifically.
Sirois (2016)	In this review, the procrastination-health model has been discussed and a temporal extension of this model has been given.	There is no discussion regarding the exercise procrastination or the role played by low physical activity levels.
Kelly and Walton (2020)	Introduced Exercise Procrastination Scale and the link to low physical activity	Does not explore the reverse relation (impact of low physical activity on Exercise procrastination)
Codina et al. (2020)	Indicated that a strategy for physical activity increasing can lead to decreasing procrastination	Does not explore athletes' perspective
Pestana et al. (2020)	Indicated leisure can lead to reduction of procrastination	Does not discuss exercise procrastination or leisure-oriented physical activities
Steel et al. (2018)	Discusses Temporal Motivation theory for procrastination.	Does not discuss Exercise Procrastination.
Hajloo (2014)	Studied the impact of self-efficacy levels on procrastination and vice versa.	The paper is focused academic procrastination and does not explore the role played in other domains like physical activity
Sehgal et al. (2017)	The role of self-efficacy in task performance and effectiveness has been explored	The paper focused on teaching effectiveness outcomes of high self-efficacy. The gap in this paper lies in ignoring impacts of low self-efficacy on performance outcomes.
Zelle et al. (2016)	Identifies physical activity as important for health outcomes. Moreover, fear and low physical movement are found to be indicators of lower self-efficacy in terms of physical activity and can lead to task avoidance and procrastination.	The paper focused on one surgical patients' group and does not tackle exercise procrastination behavior in general.

Przepiórka et al. (2019)	Explored the impact of psychological factors, including self-efficacy, on procrastination behavior and sleep issues.	This paper focuses on sleep problems only. Physical activity needs to be studied in this aspect.
Yerdelen et al. (2016)	In this paper, the researcher examined the link of anxiety and procrastination behavior in students to the self-efficacy levels and regulatory behavior.	Procrastination has been found to be increased by self-efficacy issues. Academic perspective is explored.
Benoit et al. (2019)	Studied impact of demanding or difficult tasks on the performance of students and avoidance behavior.	The study is focused on cognitively demanding tasks instead of physical tasks as per the current study's requirements.
Nair (2017)	Researched the poor student habits that can lead to increasing the negative personal emotions regarding task difficulty and procrastination behavior.	Task difficulty in terms of sports or exercise is not explored.
Busseri (2018)	Subjective well-being is tested in terms of positive affective and negative affective contexts in the form of a meta-analysis.	Meta-analysis in this study cannot be applied to sports-related contexts
Moen et al. (2017)	This study explored the impact of different events that contribute to increasing the negative affectiveness of sports for athletes.	The study does not discus procrastination, instead athlete burnout is focused.
Ivarsson et al. (2017)	Injury-related negative emotions and discontinuance behavior of athletes is discussed in this study.	There is a lack of discussion on how low levels of physical activity impact procrastination.

In the above table, it can be easily identified that several gaps exist in existing literature which include a lack of use of negative affect and perceived task difficulty variables as moderators in low physical activity and procrastination. Moreover, while the self-efficacy variable is widely tested for its impact on procrastination, there is little evidence in terms of exercise procrastination. Furthermore, the role that physical activity levels play in controlling exercise procrastination levels is also not exhaustively explored. These gaps are addressed by the researcher in the current study.

Theoretical / Research Framework

The above conducted literature review and hypotheses have led to the proposal of the following research model.

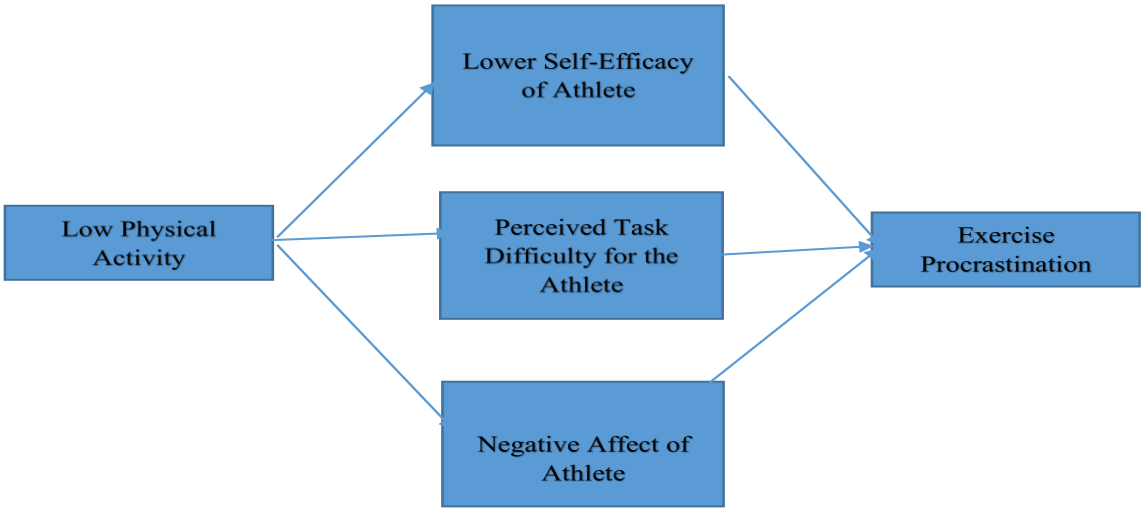

Figure 2: Research Framework

Methodology

In this chapter, the researcher has highlighted the methodological choices made by the researcher as well as their implications.

Study Design

The current study was designed as a cross-sectional online survey of ethnic Chinese people who had at some point in their lives been part of some athletics i.e. some kind of sports or recreational exercising. Electronic means of data collection have been utilized process in light of the current pandemic situation of Covid-19. Several ethical considerations were kept in view while conducting the data collection process. First and foremost, the respondents were not forced or coerced to participate. Secondly, they were informed properly about the objectives and purpose of data collection and how it will be utilized. Moreover, the researcher ensured that the data was not manipulated in any way neither was the anonymity of the respondents harmed. The completion and submission of the online survey imply that the participants consented to participating in this study. All these details were declared to the respondents at the commencement of the survey through a cover letter that was shared with them online.

Participants and Sampling Techniques

For the purpose of collecting data, the researcher chose ethnic Chinese adults (i.e., aged 21 years and over) residing in mainland China who had an experience in sports and athletics of a minimum of 2 years. The reason for this population selection was that research objectives required data to be collected from ethnically Chinese athletes will develop a better understanding of the research variables and their underlying relationships. Moreover, the researcher has opted to use the random sampling technique which is a probabilistic sampling technique in which the participants are selected using a random sample generator, but participation chances are equal.

Data Collection Procedure

The process of data collection for this study took place between 25th of June and 25th of September of the year 2020. The data collection procedure was inspired by the work of (REF) and a similar setup was administered. The participants were contacted by broadcast messages sent via WeChat IM communication software – a widely used application in China with the highest number of Chineseusers as compared to other local communication tool (REF15). The data was collected using an online questionnaire which was designed and administered through a free online Platform used for survey design and data collection in China (https://www.wjx.cn). **Questionnaire Design and Pilot Testing**

Any process of questionnaire design depends on whether the researcher wants to collect exploratory or quantitative information. There are numerous steps involved in the development of a questionnaire. Firstly, the researcher needs to determine what kind of information needs to be collected. In this questionnaire-based survey, the researcher obtained data against the demographics of the participants including the age of the respondents, their gender and their education level. Moreover, data was collected to measure the level of impact of various variables included in this study based on the research model. The target population needs to be identified for data collection and there needs to be a set of filter questions that allow the researcher to confirm that data is collected from reliable and required target resources. For this purpose the amount of experience in sports and athletics was inquired into by the researcher. Moreover, the content and structuring of the questions needs to be suitable and in accordance with the context and purposes of the research. The researcher has conducted a pilot study for this research to ensure the reliability and accuracy of the instrument. A group of 30 respondents was selected for the pilot testing out of which 15 were part of the respondent population, and 5 academics, 5 specialists from the industry and 5 language experts. The pilot study results were used to make sure that the questions are readable and reliable. The specialists were requested to check the construct face validity and relation with the research area. The responses were used to reword a few items, to regroup a few items and delete some items. The final draft was then used in the original study.

Measurement Items

The constructs in the questionnaire were measured using a five-point Likert scale that ranged from 1(strongly disagree) to 5(strongly agree) and the scales were adapted from existing studies. Moreover, the researcher developed all questionnaire items in English.

Exercise Procrastination

There are six items used for testing exercise procrastination in this survey. These items have been adopted from the seminal research work conducted by Kelly and Walton (2020) (See Literature Review).

Physical Activity

The items for the measurement of levels of physical activity were measured using 3 items. These items were adopted from the research work by Dishman et al. (2004) and adjusted according to the context of the current study.

Self-efficacy of Athlete

The items for the measurement of self-efficacy in the athletes was measured using 8 items. These items were adopted from the research work by Dishman et al. (2004) and were adjusted and reworded according to the needs of the study.

Negative Affect of Athlete

There are four items used for testing negative affect in this survey. These items have been adopted from the research work by Kelly and Walton (2020).

Perceived Task Difficulty for Athlete

There are three items used for testing the perceived task difficulty in this survey. These items have been adopted from the research work by Kelly and Walton (2020).

Analytical Tools and Procedures

The researcher conducted preliminary and descriptive tests to ensure that the data is accurate and reliable including a descriptive analysis demographic profiling, KMO test, Bartlett's test and factor analysis. Moreover, structural equation modelling was performed on the data to establish path coefficients and for the purpose of mapping the effects of the several research variables on each other and to test the hypotheses.

Results and Analysis

Demographic Details

In this study, the researcher has collected data from Chinese respondents that have, at some point of their lives, been athletes. As for the gender division, there is a low disparity in the sample set with 156 out of 298 being men and 142 being women i.e. 52.3% of the sample is male and 47.7% is female. The sample is mostly highly educated with 37 respondents (12.4%) having graduate level degrees, 129 respondents (43.3%) having post graduate degrees, 103 respondents (34.6%) having Master's degrees and the remaining 29 respondents have other degrees that are either higher or lower than the defied ones. For age-wise distribution, the researcher has divided the respondents into four age groups. The first is 21 to 30 with 22.1% respondents (66 of 298), second is 31 to 40 with 28.9% respondents (86), third group represents respondents aged between 41 and 50 with 32.6% respondents (97), and finally, the last group includes respondents aged 50 and above accounting for 16.4% respondents (49).

Descriptive Analysis

Descriptive statistics help in explaining the characteristics and nature of the collected data. Table 3 below sows summary of these statistics. It is shown that number of observations for each variable is 298 with a minimum and maximum value recorded of 1 and 5 respectively, depicting the Likert type.. The mean value is averaged around 3.5, with a standard deviation of positive 1.1 on an average, showing that for most of the statements presented a neutral response with an inclination towards agreement. For the last noted statistic, thee skewness statistic, it is a measure of the normality in the data distribution and for normal distribution, the value must stay in the threshold range of -1 and +1. The results shown in Table 3 clearly indicate that skewness is within the threshold values, even if the standard error value of 0.141 is accommodated.

Table 3: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
LPhyAct	298	1.00	5.00	3.5749	1.13599	-.761	.141
LSelfEffi	298	1.00	5.00	3.5935	1.05494	-.903	.141
PeTaskDif	298	1.00	5.00	3.5928	1.13466	-.833	.141
NegAffa	298	1.00	5.00	3.5847	1.06963	-.860	.141
ExceProcr	298	1.00	5.00	3.4586	1.12764	-.566	.141
Valid N (listwise)	298						

Sample Adequacy and Accuracy

Two tests have been used by the researcher for testing the sample adequacy and accuracy; Kaiser-Meyer-Olkin (KMO) test and Bartlett's test for Sphericity. KMO test checks if the sample in a study is suitable for the purpose of conducting Factor Analysis. To hold significance or to show accuracy of sample, the KMO adequacy statistic needs to be close to 1, and as Table 4 shows, the KMO statistic is 0.934 for this sample, indicating that the test is significant with the sample having 93.4% adequacy. As for the Bartlett's test for Sphericity, it is used to check the presence of any redundancy among the variables. The Chi-square value is shown to be 7417.767 and the degree of freedom value is 276. The condition on this test is that the null hypothesis must be rejected for proceeding to factor analysis. As shown in Table 4, the significance is 0.00, it shows that the null hypothesis is rejected. Therefore, it can be concluded that these two tests show that factor analysis can be easily conducted.

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.934
Bartlett's Test of Sphericity	Approx. Chi-Square	7417.767
	Df	276
	Sig.	.000

Factor analysis

Table 5 below shows the results of factor analysis in the form of rotated component matrix. This matrix has been used as the rotation of the factors can reduce the number of factors having a high loading value, without affecting the results. The results shows that factor loadings are above 0.6, which is a good value as per (Rahi, 2017). Moreover, it can be clearly seen that the factors studied do not have any cross loading issues, confirming data reliability.

Table 5: Rotated Component Matrix

	Component				
	1	2	3	4	5
PA1					.780
PA2					.829
PA3					.810
SE1	.668				
SE2	.757				
SE3	.815				
SE4	.831				
SE5	.831				
SE6	.834				
SE7	.834				
SE8	.813				
TD1				.814	
TD2				.842	
TD3				.866	
NA1			.781		
NA2			.821		
NA3			.808		
NA4			.791		
EP1		.802			
EP2		.849			
EP3		.890			
EP4		.883			
EP5		.895			
EP6		.891			

Common Method Bias:

The researcher has used Harman's single factor test to evaluate the presence of common method bias in the responses. The results in Table 6 below show that the total percentage of extracted variance is 40.103%, which is below the threshold of 50%, showing that no issue of this biasness is present in the data.

Table 6: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.025	40.103	40.103	12.025	40.103	40.103
2	2.962	12.343	52.446			
3	2.102	8.756	61.202			
4	1.448	6.034	77.236			
5	1.136	4.734	81.970			

Construct Validity:

Construct validity is an overall measure of both convergent and discriminant validity in the data i.e. both of these validities need to hold to ensure the overall construct validity in the research data.

The convergent validity checks that the data has internal consistency and the scale items that represent the same constructs converge. This is checked by CR, AVE and MSV values that have defined thresholds of above 0.7, above 0.5 and less than AVE, respectively; as illustrated in Table 7, all these thresholds are obeyed, therefore, the data has convergent validity. Discriminant validity is checked to ensure that scale items that represent distinct constructs do not converge. As the results show that the self-correlation coefficients are higher than those of the variable-variable correlation, discriminant validity is also present. These results, in summary, confirm the presence of construct validity.

Table 7: Convergent and Discriminant Validity

	CR	AVE	MSV	NA	PA	SE	TD	EP
NA	0.918	0.737	0.361	0.859				
PA	0.925	0.804	0.370	0.601	0.897			
SE	0.955	0.726	0.370	0.581	0.608	0.852		
TD	0.924	0.803	0.353	0.546	0.594	0.526	0.896	
EP	0.962	0.811	0.252	0.502	0.395	0.502	0.424	0.900

Model Fitness:

Table 8 shows the results for various model fitness indices along with their threshold and observed values. The fitness of the model is confirmed since all values are in accordance with the threshold limits.

Table 8: Model Fit Indices

Fit Index	Recommended Score	Observed Score	Interpretation
CMIN/DF	⩽ 3.0; 5.0	2.558	Excellent
GFI	⩾ 0.80	0.858	Excellent
IFI	⩾0.90	0.949	Excellent
TLI	⩾ 0.90	0.942	Excellent
CFI	⩾ 0.90	0.959	Excellent
RMSEA	⩽ 0.08	0.072	Excellent

Figure 2 below shows the contribution of all the contructs and their items in the overall model.

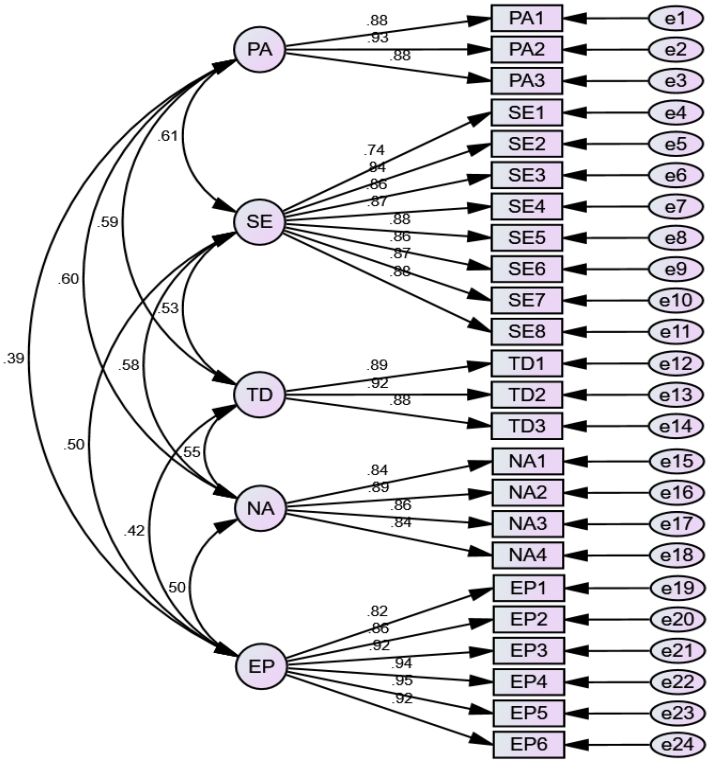

Figure 2: CFA

Hypothesis Testing:

The structural equation modeling has been used to test the hypotheses in this study. Table 9 below shows the path mapping in this study. The impact of low physical activity on low self-efficacy is significant and positive with a coefficient of 0.586. The impact of low physical activity on percieved task difficulty is significant and positive with a coefficient of 0.556. Moreover, the impact of low physical activity on negative affect is also positive with significant coefficient of 0.562. The direct impact of low physical activity on exersice procrastination is insignificant. The impact of low self-efficacy on exersice procrastination is positive and significant with an impact value of 0.294. The impact of percieved task difficulty on exersice procrastination is insignificant. The impact of negative affect on exersice procrastination is positive and significant with an impact value of 0.267. The overall indirect impact is insignificant.

Table 9: Structural Equation Modeling

	Path		Estimate	S.E.	C.R.	P
LSelfEffi	<---	LPhyAct	.586	.044	12.465	***
PeTaskDif	<---	LPhyAct	.556	.048	11.521	***
NegAffa	<---	LPhyAct	.562	.045	11.717	***
ExceProcr	<---	LPhyAct	-.014	.074	-.180	.857
ExceProcr	<---	LSelfEffi	.294	.063	4.813	***
ExceProcr	<---	PeTaskDif	.146	.057	2.451	.014
ExceProcr	<---	NegAffa	.267	.061	4.456	***
Indirect Effect			.403	.063	-	.010

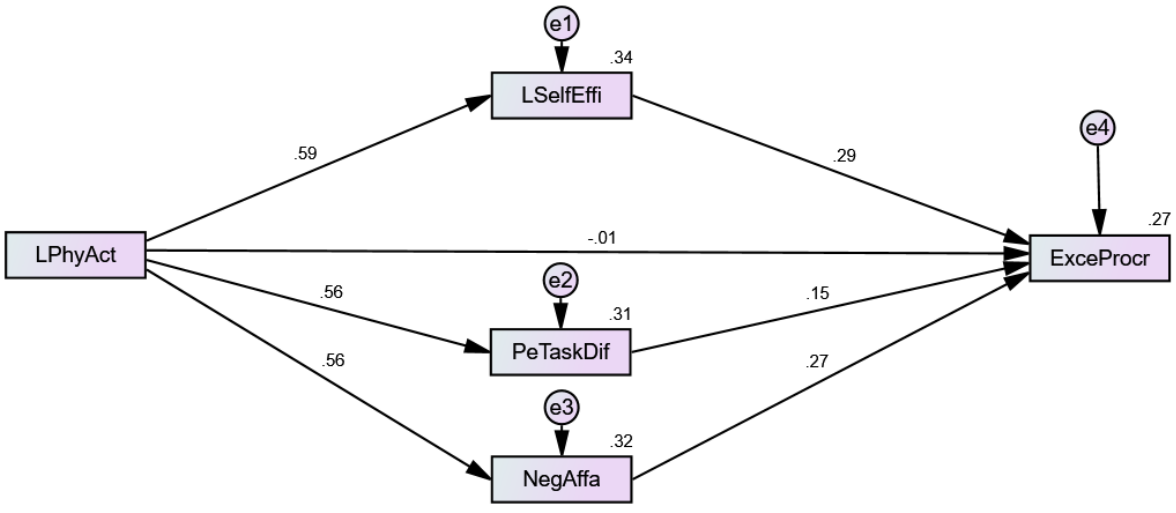

Figure 3: SEM

Discussion and Conclusion

Discussion

The main objective of this thesis was to show that if physical activity levels in athletes are reduced due to some factor, it can lead to increased exercise procrastination behavior in them. Moreover, factors such as low-self-efficacy, perceived task difficulty and negative affect of athlete were selected as mediation variables when designing the overall model of research. To meet these objectives, the researcher designed four hypotheses in this study. The first hypothesis was designed to

explain the direct relationship between low physical activity and exercise procrastination. This hypothesis was rejected i.e. the impact was found to be insignificant with the results contradicting the results of past studies that have indicated that an increase in physical inactiveness can be a determinant of increased procrastination regarding the physical activities (Kelly & Walton, 2020). The justification for this contradictory result may be that there is no precedence to compare the results with Chinese ethnic athletes so the results are novel in this aspect and show variation due to cultural and ethnic differences among the two sets of respondents. The second hypothesis of this study was formulated to map the mediation of self-efficacy, proposing that there is significant mediation of low self-efficacy of the athlete between low physical activity and exercise procrastination. This hypothesis was accepted by SEM testing. The results showed that low physical activity increases low self-efficacy by 58.6 per cent ,and in turn, low self-efficacy increases exercise procrastination by 29.4 percent. The past studies have also shown that the preparation can increase self-efficacy (Smith, 2017). In the same way, if the level of preparation will be low, it can lead to lowered levels of self-efficacy. The self-efficacy impact on procrastination has been explored by L. Li, Gao, and Xu (2020) albeit the context of academia , and has shown a similar mediating impact on procrastination as in the current study. The third hypothesis was designed to show the mediation of perceived task difficulty, proposing that there is significant mediation of perceived task difficulty of the athlete between low physical activity and exercise procrastination. This hypothesis was rejected by SEM testing as the path between perceived task difficulty and low activity was significant but that between perceived task difficulty and exercise procrastination was insignificant. These results are not in line with past studies that have found there to be a significant and positive impact of task difficulty and procrastination (Kelly & Walton, 2020; Steel & Klingsieck, 2016). The fourth and last hypothesis was designed to show the mediation of negative affect of athlete, proposing that there is significant mediation of negative affectivity of the athlete between low physical activity and exercise procrastination. This hypothesis was accepted by SEM testing. These results can also be supported by several studies like (Balkis & Duru, 2016; Kelly & Walton, 2020). The overall mediation was insignificant in this model.

Conclusion

This study was conducted in China and was aimed to collect data from athletes that have a minimum of 1 year of experience and have been out of touch with their athletics for a few months due to some reason. This quantitative research was conducted using an online survey, given Covid-19 restrictions, and was conducted using random sampling. The results showed direct relation as well as overall mediation to be insignificant. However the mediation of negative affect and low self-efficacy was significant. The key findings can be summarized as followed in context of this study's scope;

- The research showed that in Chinese athletes that have been in a low physical activity state, the exercise procrastination is negative but insignificant. This indicates that by addition or subtraction of some internal or underlying constructs in the study, the impact can change. The overall suggestion is that athletes should try to maintain a minimal required activity level to avoid fostering of procrastination behavior in the future.
- Self-efficacy is a vital indicator of behavior in any person, including Chinese athletes. If the self-efficacy of the athlete is harmed in any way, then their behavior will incline towards exercise procrastination
- The impact of lack of physical activity can lead to increasing the perceptions about the difficulty of performing a task; however, the findings indicate that this will not increase the levels of exercise procrastination among Chinese athletes.
- The negative affective emotions and behavior of the athletes can be increased if the physical activity is low. This indicates that the fear of performance, shyness, confusion and other hindrances can intensify if there is low level of activity. The negative affective emotions have also been shown to lead to an increase in exercise procrastination among Chinese athletes.

Implications

There are theoretical, practical and policy implications emanating from the current study. In terms of theoretical implications, the research paper takes stock fo the Temporal Motivation Theory (TMT) and other procrastination theories that can lead to improving the literary knowledge of the subject researchers on analysis and help academic scholars. Moreover, this paper builds on theoretical knowledge in the area of exercise procrastination as well. In addition, there are practical implications of the study which include a more informed perspective to guide the work of sports organizations or athlete managers in terms of managing the physical activities of athletes that are away from their game due to some reason, so that exercise procrastination can be avoided in the long term. Policy makers can also learn from the findings of this study, including the fact the self-efficacy of the athletes needs to be boasted to keep them motivated to participate. Moreover, they can also adapt that the athletes rejoining their sports or exercise should be given tasks to perform gradually so that they are not perceived as high difficulty tasks and negative affective feelings like fear or low self-assurance of the athletes can also be managed and reduced to control procrastinating behavior in athletes. Individual athletes can also benefit from this study as the findings can help them decide how to more effectively manage their physical activity levels in order to avoid procrastination.

Future Research Recommendations

There are several limitations linked to the current study that need to be noted in order to facilitating future researchers in designing better studies in this area. Firstly, data used in this study lacked diversity in geographical terms, i.e. the study was based on data collected in China alone. There is a tendency of respondents sharing the same beliefs if they belong to the same geographical region or cultural background. Thus, researchers in the future should test the validity and reliability of the current model by adding data from different countries to check if culture influences have the tendency to impact the level of exercise procrastination in athletes. Another limitation of this study lies in the fact that the study is focused on the exercise procrastination in the athletes only and the people that have not been part of an athletic team are ignored. This further reduces generalizability in the results obtained in this research. In future, it may be interesting to see the findings of this study tested for applicability in people having non-athletic backgrounds. Moreover, it is suggested that future researchers use longitudinal design to investigate a bigger sample size data set than the one used in this study, and investigate how exercise procrastination can be reduced by controlling factors such as self-efficacy, task difficulty perception and the negative affective nature of sports. Moreover, future researchers should explore methods that can be used to reduce procrastination and increase physical activity levels in light of Covid-19 restrictions.

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