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Master's Thesis of Global Sport Management

An examination of the anti-doping behavior of professional tennis players

계획행동이론의 확장 모델에 따른
프로 테니스 선수들의 반도핑 행동에 대한 분석

2021년 8월

서울대학교 대학원

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이 논문은 문화체육관광부와 국민체육진흥공단 지원을 받아 수행된 연구임
This work was supported by Ministry of Culture, Sports, and Tourism and Sports Promotion Foundation

An examination of the anti-doping behavior of professional tennis players

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August 2021

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Abstract

An examination of the anti-doping behavior of professional tennis players

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Professional tennis and the sport, in general, has become increasingly popular around the world. Youth and adults become supporters of players who from time to time, fall to the threat of doping. This study aimed to gain deeper understanding into the anti-doping behavior among professional tennis players using the theory of planned behavior (TPB) and its respective set of beliefs. This study tests the efficacy of the belief expectancy-value model to measure the relationship that beliefs have with attitude, subjective norm, and perceived behavioral control (PBC), and these with intention to avoid doping. The study used a TPB questionnaire containing items concerning the modal salient beliefs and direct measures of the theory. 243 responses were obtained, and the results were analyzed using Structural Equation Model (SEM). The belief constructs formed positive and significant associations with their corresponding social cognitive variables. The researcher found that PBC has the strongest relationship with intention to avoid doing, followed by attitude with a slightly weaker but still positive and significant relationship. An important finding turned out to be the weak relationship of subjective norm with intention. In summary, the

findings suggest that anti-doping behavior among professional tennis players can be understood withing the TPB framework, and these should be used to developed more informed interventions for the governing bodies in the sport.

Keywords: anti-doping, theory of planned behavior, beliefs, professional, tennis

Student Number: 2019-21720

Acknowledgement

Research was, to me, the most frightful part of the Dream Together Master program. I knew that this would take me through new paths. Anyone who knows me well enough, knows that I do not like change and uncertainty, but at the same time, love challenges. This is how I faced this research, respecting the uncertainty, and excited for the opportunity.

First, I must thank my parents, because they are the rock on which I stand, and they are the solid pillars of my life. They always prioritized education for my siblings and me, and I hope that with this master I can show them, briefly, that I listened to them and I am grateful for bringing me here.

Second, I must thank those with whom I worked closely on this research, my advisor, Kim Yu Kyoum; my tutor, Oh Jihyeon; and those couple classmates that guided me through the process of writing a research paper, and how to work that complex statistical software. I learned so much, and these learning is what I take with me to the next chapter.

Lastly, I am grateful those that make this program happen. They are proving us, the students, with an immense number of great opportunities to learn. Thanks to these efforts, now I can say that I have met and learned from some of the best scholars in the world in this field.

Table of Contents

ABSTRACT	I
ACKNOWLEDGEMENT	III
TABLE OF CONTENTS	IV
LIST OF FIGURES	VI
LIST OF TABLES	VII
CHAPTER 1. INTRODUCTION	1
1.1. Background of study.....	1
1.2. Purpose of Research	5
1.3. Research Questions	6
CHAPTER 2. LITERATURE REVIEW	7
2.1. Anti-doping.....	7
2.1.1. Brief historical overview of fight against doping	7
2.1.2 Tennis and anti-doping	8
2.2. Extended Model of Theory of Planned Behavior.....	13
2.2.1 Theory of Planned Behavior	13
2.2.2. Modal Salient Beliefs.....	16
2.3. Research Model and development of hypothesis	20
CHAPTER 3. METHOD	23
3.1. Participants	23
3.2. Indirect belief-based measures	23

3.3. Direct measures of TPB constructs	25
3.4. Data Collection	26
3.5. Data Analysis.....	27
CHAPTER 4. RESULTS.....	30
4.1. Descriptive Analysis	30
4.2. Theory of Planned Behavior and Expectancy-value Model.....	32
4.3. Confirmatory Factor Analysis (CFA)	33
4.4. Structural Equation Modelling (SEM)	38
CHAPTER 5. DISCUSSION	42
5.1. Directly measured variables of the TPB	43
5.2. Indirectly measured variables of the TPB	46
5.3. Limitations and Future Research.....	50
5.4. Implications	54
5.5. Conclusion.....	56
REFERENCES.....	57
ABSTRACT (KOREAN).....	67

List of Figures

FIGURE 1. HYPOTHESIZED MODEL.....	22
FIGURE 2. CONFIRMATORY FACTOR ANALYSIS (CFA).....	34
FIGURE 3. STRUCTURAL EQUATION MODELING (SEM)	40

List of Tables

TABLE 1, SUMMARY OF DEMOGRAPHIC CHARACTERISTICS	32
TABLE 2, CORRELATION MATRIX OF MEASURED VARIABLES.....	33
TABLE 3, CONFIRMATORY FACTOR ANALYSIS FIT INDICES.....	35
TABLE 4, RELIABILITY AND VALIDITY INDICES	37
TABLE 5, MODEL FIT MEASURES OF SEM	38
TABLE 6, STANDARDIZED REGRESSION COEFFICIENTS SEM	39

Chapter 1. Introduction

1.1. Background of study

Tennis is commonly promoted as an ideal sport to improve physical activity levels of the general population, with a variety of associated health benefits (Kovacs, Pluim, Groppe & Health; Marks, 2006). Benefits such as increased brain power, reduces stress, strong leg muscles, better hand-eye coordination, strong heart, strong bones, leaner body, and higher fitness levels, are attributed to this sport (Pluim, Groppe, Miley, Crespo & Turner, 2018). They mention that tennis, with approximately 75 million participants around the world, is one of the most popular sports. This is a sport that can be played at every age and at every level. Seniors can come into the sport at any age and play all their life, with international tournaments for almost all ages. The popular eye is on the elite players, who compete all over the world through the professional circuits carried out by the International Tennis Federation (ITF), Association of Tennis Professionals (ATP), Women's Tennis Association (WTA). Pluim et al. (2018) add that there are over 210 countries affiliated to the ITF, and in 2017, 134 countries participated in the Davis Cup, resulting in the world's largest annual international team competition in sport.

Commonly known as an ancient royal sport, tennis has seen popular athletes fall to the temptations from doping, engaging in illicit behaviors that put their entire careers in danger (Maquiarriain & Baglione, 2016).

Doping has reached to sport so deeply, that the younger categories of the sport have been affected, with a teenage tennis player testing positive for an anabolic-androgenic steroid (TADP, 2019). Since the 1990s, with the formation of the ATP and WTA, the efforts in the fight against doping stepped up (Zandonai & Holgado, 2020). Even though the incidence of doping in tennis, is relatively not high compared to other sports, the risk of succumbing to the temptation still exists.

The World Anti-Doping Agency (WADA; 2009) states that the use of banned performance-enhancing substances and methods, popularly known as ‘doping’, is regarded as one of the most critical problems in sport. Stakeholders (i.e. sport governing bodies, sport scientists, and medical professionals) have put significant effort and resources to limit the accessibility of banned substances and improve the effectiveness of doping control processes. Still, there has been no noticeable reduction in the incidence of doping in sport (WADA, 2012).

There has been a growth in the amount of literature focusing on the psychological factors that influence athletes’ use of prohibited substances or methods to improve their sport performance (Barkoukis, Lazuras, Tsorbatzoudis, & Rodafinos, 2011; Ehrnborg & Rosén, 2009; Gucciardi, Jalleh, & Donovan, 2011; Ntoumanis, Ng, Barkoukis, & Backhouse, 2013, Chan, et al., 2015). Usually, researchers have used social-cognitive and motivational models from social psychology to try to identify the influential factors on doping intentions and behavior. The Theory of Planned Behavior

(TPB); Ajzen, 1985, 1991) has been popularly for the purpose of explaining athletes' doping intention and behavior (Goulet et al., 2010, Lucidi et al., 2008, Ntoumanis et al., 2013, Wiefferink et al., 2008, Zelli et al., 2010).

The theory suggests that the degree to which one plans to engage in a behavior in the future, intention, is the closest predictor of behavior. This intention is a function of a person's attitude (i.e. favorable or unfavorable evaluation of a behavior) , subjective norm (i.e. perceived social pressure to perform or not certain behavior; perceived appropriateness of the behavior), and perceived behavioral control (i.e. person's perception of the ease or difficulty of performing certain behavior) towards the behavior. The TPB has been examined in several studies concerning athletes' doping intentions, but there is little research applying the TPB regarding the belief-based components considered to strengthen the three direct variables affecting intention. Ajzen (1985,1991) and Fishbein & Ajzen (1975) suggest that there are three sets of beliefs that strongly correlate with the direct measures and provide indirect estimation of attitude, subjective norm and PBC. These specific beliefs are behavioral, normative and control beliefs, respectively. Ajzen (1985, 1991) proposed an expectancy-value model to explain the role the beliefs play in impacting intentions and behavior. He suggested that individuals used memory, past experience, and situational information to build expectancies of relevant outcomes, and referent, barriers or facilitation factors regarding the specific behavior. He suggested that the degree to which the belief-expectancies impacted formation on future intentions to

perform a behavior was determined by the value placed on each belief. Values add weight on determinants of intentions.

Factors like the perception of the likelihood of detection, the severity of the penalty, and the efficiency and effectiveness with which sanctions will be applied, all appear to determine levels of deterrence in doping (Strelan & Boeckmann, 2006). There is a continuous need for better understanding of doping deterrents to enhance doping control programs and reinforce the testing strategies to be carefully and strategically applied, and strongly enforced (Dvorak, et al., 2014). Similarly, sport organizations need to regularly emphasize that doping behavior is fundamentally contrary to the principles and spirit of sport, but this can be done if they have the necessary information about the understanding of the athletes' decision-making.

Sport is believed to have an important role in molding and modifying attitudes and beliefs. The expectations about conduct and behavior that participants learn through sport, must be carefully evaluated. These expectations if properly addressed, can strengthen the perception in athletes that certain violations are not bad. Therefore, when there are risks in the integrity of the sport, there is a need for understanding its processes to properly address it.

The research done by Chan, et al. (2015) concluded that the strong influence of belief-expectancies towards social cognitive variables (i.e. attitudes, subjective norms, and perceived behavioral control) imply that young athletes are more likely to intend to be aware of and manage the risk

of doping when they perceive the behavior to be beneficial, important, achievable and supported by people they value. The present study intends to test these ideas with a significantly different population. The previous research focused on elite and sub-elite young athletes that mostly competed at national and lower levels (only 12% competed internationally). Differently, this research will focus on the general population of professional tennis players, where all or most of them compete internationally and at the highest levels of the sport. The differences in age, and levels of competition could be determinant to show different results, because the experience tends to be vaster and the stakes of competition are higher.

1.2. Purpose of Research

The aim of this study is to test the role of modal salient beliefs in its influences over the directly measured social-cognitive variables and the intention of professional athletes' doping avoidance in tennis. The study will be focused on avoidance of doping because this is the important and necessary behavior, in which athletes show restraint and self-awareness, to achieve anti-doping objectives. The importance of this research is in providing information about possible targets for intervention to promote anti-doping behavior in professional tennis.

Based on previous research adopting the TPB in doping and anti-doping contexts (Goulet et al., 2010; Lucidi et al., 2008; Ntoumanis et al., 2013; Wiefferink et al., 2008; Zelli et al., 2010) and the literature on modal

salient beliefs (Armitage & Conner, 1999; Armitage et al., 1999; Clayton & Griffith, 2008; Sutton et al., 2003), the hypotheses for this study are:

H1: Attitude towards anti-doping has a positive and significant influence on intention to avoid doping.

H2: Subjective norm has a positive and significant influence on intention to avoid doping.

H3: Perceived behavioral control (PBC) has a positive and significant influence on intention to avoid doping.

H4: Behavioral belief has a positive and significant influence on attitude towards the intention to avoid doping.

H5. Normative belief has a positive and significant influence on subjective norm regarding anti-doping intentions.

H6: Control belief has a positive and significant influence on PBC with regards to anti-doping intention.

1.3. Research Questions

RQ 1. Do directly measured variables of the TPB (i.e. attitude, subjective norm and perceived behavioral control) affect the intention to avoid doping positively?

RQ 2. What are the effects of belief-based components on the three directly-measured variables of the TPB?

Chapter 2. Literature Review

2.1. Anti-doping

2.1.1. Brief historical overview of fight against doping

The Ancient Greek Olympians were reported to use performance enhancers such as dried figs, mushrooms, and strychnine to perform better. A Century ago, the era of doping started in the 20th century with the illegal drugging of racehorses. In modern times, there has been a correlation between the discovery of a drug and its use in sports. Throughout the years, news illegal substances were introduced in sport. The International Association of Athletics Federations (IAAF) in 1928, was the first ever sports federation to ban the use of doping products in sport. Later, in the 1960s the International Olympic Committee (IOC) collected the first anti-doping samples in the Rome Olympic Games while the International Cycling Union (UCI) and the International Federation of Football Associations (FIFA) planned their first anti-doping programs during the World Championships celebrated in the same decade.

The most significant progress of harmonization in the fight against doping in all sports around the world was in 1999, with the creation of the World Anti-Doping Agency (WADA). This organization was established as a single independent international agency with the aim of distributing a universal Anti-Doping Code that synchronized anti-doping polices among all stakeholders. WADA has improved coordination of national and

international anti-doping organizations, implemented cooperation with law enforcement, monitored compliance with the rules, and increased the relevance of education as a key aspect in the fight against doping (Aguilar et al., 2017). The most important achievement by WADA in terms of a universal set of rules has been the development of a single list of banned substances together with the improvement of the methodologies used to detect their use (Dvorak et al., 2014)

Andren-Sandberg (2015) notes that WADA's success in establishing an international drug code has been supported by three factors. First, WADA is funded both by IOC and a group of national governments. This allows for the organization to have relatively sufficient resources and influence. Secondly, WADA has supported its international declarations that have praised and confirmed the policy code it has developed. Lastly, WADA policy has been approved by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as an international convention. This convention is the first legally binding international framework setting out the responsibilities of national government and is currently signed either as ratification, acceptance, approval, or agreement by all major countries. Due to these measures, WADA now is now the central international agency for regulation drug use in sport.

2.1.2 Tennis and anti-doping

Next to match-fixing, the use of performance enhancing drugs is

one of the two biggest threats this sport is currently facing. The ITF, ATP, WTA, and the four Grand Slams are the major governing bodies of the sport. These governing bodies have invested intense efforts alongside the medical community to reduce the doping problem, but the consumption of PEDs remain constant (Maquirriain & Baglione, 2016).

In the 1980s, anti-doping effort started gaining attention in the sport due to the need to stop the consumption of illegal substances like, marijuana, cocaine, and methamphetamines. In 1990, the ATP was created, and the governing body of men's professional tennis extended the testing to include PEDs. The ITF and WTA also had extensive anti-doping Programmes, and in 1993 the three major bodies creating a joint anti-doping Programme that covered the whole of tennis. The ITF became the sole governing body responsible for the management, administration, and enforcement of the Programme at both, ATP and WTA, sanctioned events. The program in accordance with WADA Code is Tennis Anti-doping Program (TADP), which has the purpose of maintaining the integrity of tennis and protecting the health and rights of tennis players participating in recognized competitions. According to the ITF, these competitions are, Grand Slam tournaments, Davis Cup, Fed Cup, Hopman Cup, the Olympic Tennis event, the Paralympic Tennis event, other IOC-recognized International Events, WTA tournaments and WTA finals, ATP Tour tournaments and ATP Finals, Next Gen ATP Finals, ATP Challenger Tour tournaments, ITF Pro Circuit events, ITF World Tennis Tour events, ITF Juniors events, ITF Seniors

events, ITF Wheelchair events, and the ITF Beach Tennis Tour events.

The WADA reports in 2017, reported that 322,050 doping controls were done in all sports in that year, and that only 1.48% of tests were positive (WADA, 2017). By this low percentage, it can be assumed that doping in sport is almost nonexistent and not as big an issue as people usually think it is. But, Zandonai & Holgado (2020) point out the negative doping tests are not necessarily proof that athletes are “clean” (e.g. Lance Armstrong). More specifically, WADA performed 5,959 tests in tennis players and the rate of positives was 0.5%.

Literature of doping in tennis is short. Maquirriain (2010) studied doping offenses committed on the professional tennis circuit and found that overall incidence was low compared to the number of participants. The study analyzed all the offenses in the years between 2003 and 2009 and found that only 0.38% of the samples were positive. Male players showed more incidence than female and wheelchair players were at higher risk to commit a doping offence (Kondric et al., 2013) found a low tendency with respect to future doping usage among international high-level players of both sexes, but most of them are convinced that doping exists in tennis. Maquirriain & Baglione (2016), analyzed the careers of male tennis players after sanctions of doping. They recorded all the doping offenses committed by professional player during the period of 2003-2014. They later analyzed their ranking positions at the moment sanction was announced, their best ever ranking and best rankings after the doping violation. The study

concluded that sanctions seem to significantly influence players' careers, as most of them reached career highs before the sanction. These sanctions led to early retirements from the sport and 12% of them, did not come back to play (Maquirriain & Baglione, 2016).

The first anti-doping violation in tennis occurred in 1996, during a Challenger tournament (Maquirriain, 2010). Andre Agassi, admitted in his autobiography that the same year, he had used amphetamines to improve his performance (Harrison & Stewart, 2010), and even though ATP knew about this, he was never sanctioned for this. In 2007, Martina Hingis was suspended for two years after testing positive for a cocaine metabolite. The Czech player Petr Korda, and Argentinian players, Guillermo Coria, Juan Ignacio Chela, Guillermo Canas and Mariano Puerta, tested positive for anabolic-androgenic steroids. The most recent and notable case was that of Maria Sharapova. During the 2016 Australian Open, she tested positive for meldonium, a drug that is used in patients with angina pectoris, chronic heart failure and cerebral circulation disorders (Rabin et al., 2019). Sharapova stated that she was not guilty, admitting she used this substance as a prescription-based drug for more than ten years due to her susceptibility to influenza, treatment for symptoms of diabetes and magnesium deficiency ("Maria Sharapova's doping ban cut from two years to 15 months", 2020). A report by the ITF and WADA found that while Sharapova may not have been purposely using the substance to increase performance, it is the responsibility of the player to be aware of the list of banned substances. Ten

months after the offense, in October, following an investigation by the Court of Arbitration for Sport (CAS), Sharapova's ban was reduced from two years to 15 months, after it was concluded that she had no intention to cheat.

Other notable cases have been those of Andre Agassi (as mentioned above), Richard Gasquet, Marin Cilic and Victor Troicki. The first, the Frenchman Gasquet, tested positive for cocaine use. A report of The Guardian (2009) stated that Gasquet denied the intentional use of this drug, declaring that he may have been exposed to the substance after kissing a woman at a nightclub. In 2013, Cilic tested positive for the substance nikhethamide, which was used as a stimulant that enhances respiratory function through the increase in blood flow and oxygen intake. He also denied taking the drug on purpose, claiming the substance was in some glucose tablets. He initially received a nine-month ban due to the low level detected in his body, but after a successful appeal to CAS, the ban was reduced to four months.

The ITF list is consistent to that of WADA, and its drugs are categorized as anabolic agents, peptide hormones, bet-2 agonists, hormone and metabolic modulators and diuretics and masking agents (TADP, 2019). In addition, the list includes the banned doping methods, such as, blood doping, chemical doping and gene doping. Even though it is not recognized as a method in this list, the un/intentional avoidance or missed drug tests carried out by the ITF or other anti-doping body is also recognized as a type of doping offence. A missed test can result in a ban from professional

circuits of up to two years (TADP, 2019).

Scholars point out that the ITF and national federations must focus on the need for further preventive actions and make joint educational efforts to counter doping practices potentially harmful to the health of their players, and the sport (Zandonai & Holgado, 2020). Efforts supported by scientific investigation and the bodies involved, are needed to gain knowledge on the phenomenon of doping in tennis, given that it is one of the most widely played and followed sports in the world (Pluim et. al, 2018).

2.2. Extended Model of Theory of Planned Behavior

2.2.1 Theory of Planned Behavior

The TPB is a continuation of Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA), which is proposed for the prediction and understanding of certain behaviors in specific contexts (Ajzen, 1991). Additionally, Ajzen describes the general process by which people understand the risks and benefits of a given behavior, and act (or not) on it. TPB assumes that an individual's actual behavior is directly influenced by his or her behavioral intention. On previous studies of the relationships between attitudes and behavior, Fishbein and Ajzen (1975; Ajzen and Fishbein, 1977) developed the principle of compatibility (Ajzen, 1988). The principle says that each attitude and behavior has four elements of action, target, context and time, and states that the correlation between attitudes and behavior will be most significant when both are measured at the same level

of specificity with respect to each of the four elements. Therefore, the behavior consists of an action or behavior, performed on or toward a target or object, in a specific context at a time or occasion (Conner and Sparks, 2020).

Attitudes are the first of the three predictors of behavioral intention in the TPB. These are the overall evaluations of the behavior by the individual. An attitude is a learned disposition to respond in a consistently favorable or unfavorable manner with respect to a given behavior (Fishbein & Ajzen, 1975). Based on the principle of compatibility, the relevant attitudes are those towards performance of the behavior, evaluated at a similar level of specificity to that used towards its assessment. A favorable or unfavorable attitude is directly influenced by the strength of the behavior and beliefs regarding the likely outcome.

Subjective norms are the second determinant of intentions in the TPB. Conner and Sparks (2020) state that it represents the perceived social pressure from others to perform a behavior. They add that it consists of a person's beliefs about whether significant others think he or she should engage in the behavior. Significant others can be defined as individuals or groups whose preferences about a person's behavior in this area are important to him or her. In other words, subjective norms refer to the perceived social approval or endorsement of the behavior by referent groups (Yoon, 2011).

The TPB was added to the TRA model to widen the applicability

farther from volitional behaviors by including explicit considerations of perceptions of control over performance of the behavior as an additional predictor or influencer of behavior (Ajzen, 1988, 1991). These consideration of perceptions of control are important because the applicability of the theory to behaviors that include more complexity and are more difficult to perform. The link between PBC and behavior is complex because the implementation of an intention into action is, in part, determined by personal and environmental barriers. Therefore, the addition of PBC should become more useful as volitional control over behavior decreases (Ajzen, 1991). What this means is that in situations where prediction of behavior from intention could be affected by level of actual control, PBC should and could, facilitate the performance of the behavior (Armitage and Conner, 2001). It is difficult to obtain the actual measures of control, but these are difficult to obtain, so perceptions of control are used as proxy measures for actual control. Armitage and Conner (2001) found out that interactions between intentions and PBC is significant in around half of reported tests.

The TPB has been popularly used as a model that successfully predicts and explains behavior across a wide area of settings (Lin et al., 1999). In other unethical behaviors in sport, like match-fixing, the model has been applied only by (Barkoukis et al., 2020). More focus has been put on the doping to understand this specific behavior (Goulet et al., 2010; Lucid et al., 2008; Ntoumanis et al., 2013; Wiefferink et al., 2008; Zelli et al., 2010). Other dishonest behaviors have been evaluated with this model,

such as academic misconduct and cheating, and tax evasion e.g. (Beck & Ajzen, 1991; Bobek & Hatfield, 2003); Chudzicka-Czapala et al., 2016; Stone et al., 2009).

The TPB seems suitable for the context of this study because previous research has usefully used this theory to predict doping in different groups of elite and non-elite athletes (Ntoumanis et al., 2013).

2.2.2. Modal Salient Beliefs

According to the TPB, the three major variables determining the strength in intention to engage in a behavior are attitude, subjective norm and PBC. These are direct measures that summarize sets of personal, social, and volitional beliefs, more commonly referred to as behavioral, normative and control beliefs (Ajzen, 1985, 1991; Fishbein & Ajzen, 1975). These beliefs are set to strongly influence the direct measures and provide an indirect estimation of attitude, subjective norm, and PBC, respectively. An expectancy-value model was developed by Ajzen (1985) to specify the process by which the sets of beliefs influence intentions and behavior. He suggested that individuals used the value of past experiences and situational information to build interpretations or expectations of the salient outcomes, and obstacles or facilitating factors regarding the behavior (Ajzen, 1985, 1991; Fishbein & Ajzen, 1975). The value placed on each belief determined the degree to which the belief-expectancies impacted creation of future intentions to act. The effects of the beliefs on intentions, could be used as

the interactive or multiplicative of the belief-expectancy and belief-value assigned to it. Ajzen (1985, 1991) suggested the following expectancy-value formulation regarding the three sets of beliefs:

Behavioral belief = behavioral belief-strength (i.e. the perceived probability of behavioral outcomes) x outcome evaluation (i.e., the subjective evaluation on the expected outcomes).

Normative belief = normative belief strength (i.e. the perceived social approval or disapproval of a particular social agent) x motivation to comply (i.e., one's willingness to comply to the social agent)

Control belief = control belief-strength (i.e. the likelihood of behavioral easing/inhibition) x control belief-power (i.e. the perceived power of the behavioral facilitation/inhibition).

The expectancy-value model of beliefs included in the TPB highlighted how the beliefs led to intention creation and predicted actual future behavioral engagement through the mediation of intention (Ajzen, 1985, 1991). To efficiently capture these beliefs, usually researched use an open-ended elicitation questionnaire. In this one, participants from the target population are asked to provide an extensive list of salient factors likely to affect the behavior. Then, the list goes through a content analysis to identify those that are more salient or frequently noted. Empirical tests of the model have typically avoided the time-consuming process of belief elicitation, and focused on using more direct measures of the three factors considered to be leading to intentions and behavior: attitudes, subjective norms and PBC

(Hagger, et al., 2007; Hagger, et al., 2001). These direct measures help summarize the statements of the behavioral, normative, and control beliefs, that are usually gotten through self-reported questionnaire (e.g., Chan, Fung, & Hagger, 2013; Chan & Hagger, 2012; Lucidi, et al., 2008; Zelli, et al., 2010). Hagger & Chrysanthos (2005) and Rhodes & Courneya (2003) pointed out that the direct measures have been proposed to be enough in capturing salient beliefs, so, the effect of expectancy-value models of beliefs are expected to be fully mediated by the direct measures, denying the need for belief elicitation. But the belief elicitation helps provide specific information regarding which beliefs are most intricately connected to intentions to perform a behavior, they are known to be key for intervention focused on changing intentions (Hardeman et al., 2002). So, it is important to find out the beliefs and examine which have strong associations with a specific intention to gather evidence that will provide valuable information for future intervention (McEachan, Conner, Taylor, & Lawton, 2011).

The expectancy-value model linked to the TPB has been tested in several health contexts, such as patients' self-medication (Ried & Christensen, 1988), drug abuse (Armitage, et al., 1999), healthy dieting (Armitage & Conner, 1999), physical activity (Hagger, et al., 2001), hand hygiene (Clayton & Griffith, 2008), and anti-doping (Chan, et al., 2015). In most of these studies, the multiplicative approach of the modal salient beliefs recommended by Ajzen has led to statistical results impossible to interpret due to inconsistencies in the proposed item scaling procedures,

computational processes, and notable measurement errors (Chan, et. al., 2015). Due to these complications, researchers have speculated that belief-expectancy and belief-values alone, without any interactive or multiplicative approach would be better in solving some of these analytic and computational problems and may account for similar or even more proportion of the variance in their corresponding directly-measured social cognitive variables than the multiplicative composites (French & Hankins, 2003; Sullivan, McGee, & Keegan, 2008).

French and Hankins (2003) suggested four possible solutions to the use of belief-expectancies and belief-outcomes in the TPB, a problem they called ‘expectancy value muddle’: (1) using belief-expectancies only, (2) using both belief-expectancies and belief-values, (3) using the multiplicative composites of belief-expectancies and belief values only, and (4) using all the above. Their research proposed that the use of multiplicative composite alone or together with the belief-expectancies and belief-values offer no significant advantage when it comes to behavioral prediction above the use of belief-expectancies alone. In addition, they suggest that the belief-value and the proposed interactive model did not provide a more effective prediction of the intentions, most likely, because respondents instinctively assign high value when making self-report assessments of belief-expectancies opposing the need for a separate value variable. But there are examples in the literature that demonstrate the importance of multiplicative composites of belief-expectancies and belief-values on behavior

(e.g., Armitage & Conner, 1999, Armitage et al., 1999, Clayton & Griffith, 2008)

2.3. Research Model and development of hypothesis

In this study, the aim is to evaluate the effects of modal salient beliefs within the Theory of Planned Behavior (TPB) in the context of doping avoidance in professional and elite tennis players. The purpose is to, first, identify the viability of the model in effectively interpreting the role of important modal salient beliefs and, second, validate (or not) previous results of Chan, et al. (2015) of the same area of research, but within a different population.

The use of doping avoidance as the specific behavior is important because it is a key perspective for achieving anti-doping objectives is the avoidance of doping, in which athletes display personal effort of refusing an offer to consume banned performance-enhancing drugs or methods. Additionally, attempting to achieve anti-doping requires athletes to demonstrate awareness of the substances they consume and the social situations they need to avoid ensuring safety. Before Chan, et al. (2015) there had not been any study using the TPB as the framework to understand athletes' anti-doping intentions and behavior (see Ntoumanis et al., 2013). The preventive behavioral context is significant for professional athletes and consistent with the goals of most anti-doping organizations (World Anti-Doping Agency, 2009). An additional goal of this study is to test the

influence of modal salient beliefs on the directly-measured variables of the TPB and the intention of professional tennis players' doping avoidance.

The hypotheses for this study are based on previous research adopting the TPB in anti-doping contexts (Goulet et al., 2010, Lucidi et al., 2008, Ntoumanis et al., 2013, Wiefferink et al., 2008, Zelli et al., 2010) and the literature on modal salient beliefs (Armitage & Conner, 1999, Armitage et al., 1999, Clayton & Griffith, 2008, Sutton et al., 2003), and are the following (see Figure 1):

H1: Attitude towards anti-doping has a positive and significant influence on intention to avoid doping.

H2: Subjective norm has a positive and significant influence on intention to avoid doping.

H3: Perceived behavioral control (PBC) has a positive and significant influence on intention to avoid doping.

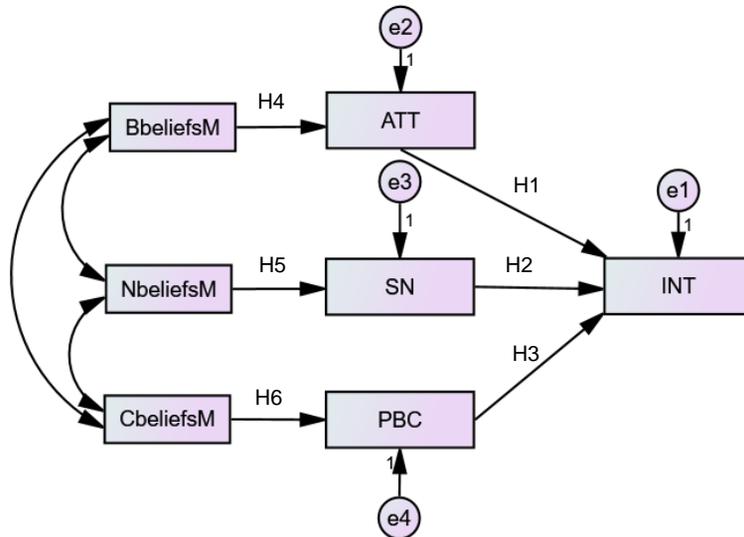
H4: Behavioral belief has a positive and significant influence on attitude towards the intention to avoid doping.

H5. Normative belief has a positive and significant influence on subjective norm regarding anti-doping intentions.

H6: Control belief has a positive and significant influence on PBC with regards to anti-doping intention.

Figure 1.

Structural Equation Model for this study



Note. INT = intention; ATT = attitude; SN = subjective norm; PBC = perceived behavioral control; BbeliefsM = Behavioral belief measure; NbeliefsM = normative belief measure; CbeliefsM = control belief measure

Chapter 3. Method

3.1. Participants

Participants were tennis players competing at an elite level. They were be players who regularly or irregularly (e.g., college players who play the circuit in the time off from school, like summer vacation) play the professional circuit. Participants were be both female and male, with no restriction to country of origin and older than 17 years old. The age was decided because that is around the time when most professional players start making the transition from junior into professional tennis. They all start at the lower levels of the circuit, and they start going up the ladder. These circuits are the ITF Futures Circuit, which has two types depending on the prize money and ranking points available (\$15k and \$25k). The Challenger Tour consists of Challenger 80, 90, 100, 110 and 125 events, depending on the number of points available for men (ATP Tour, 2020). For women, the levels are 60, 80 and 100 (ITF Tennis, 2020) the WTA tour, and the ATP tour. Participants were be informed about the purpose of the study, the voluntary nature of participation, confidentiality and anonymity of their responses, and their rights to retire from the study and have their data deleted at any time without giving a reason.

3.2. Indirect belief-based measures

This study's set of modal salient beliefs was based on the previous study on intention to avoid doping by Chan et al., (2015) and

recommendations from Ajzen (2002). It included a set of items for behavioral belief strength and the corresponding outcome evaluation, another set of pairs for normative belief strength and motivation to comply, and a set of pairs of items for control belief strength and control belief power. These items were expected to reflect the core content of each expectancy-value component of the TPB.

Seven-point Likert scales were used for participants to give responses to four items regarding behavioral belief strength (1 “extremely unlikely” to 7 “extremely likely”), three for outcome evaluation (1 “bad” to 7 “good”), five for normative belief strength (1 “I should not” to 7 “I should”), three for motivation to comply (1 “not at all” to 7 “very much”), control belief-strength (1 “strongly disagree” to 7 “strongly agree”), and control belief-power (1 “difficult” to 7 “easy”) constructs. The unipolar scale ranging from 1 to 7 will be used because the bipolar scales typically used for these measures ranging from, -3 to +3 may lead to an underestimation of factor correlations for negatively-framed items and a biased estimation of the multiplicative scores due to the problem of ‘double negatives’ (French & Hankins, 2003; Sullivan et al., 2008; Trafimow & Finlay, 2002).

Behavioral belief strength included items measuring the perceived likelihood of certain outcome to happen, such as competing fairly against others, or prevention from potential side effects of drugs in the health. Normative belief strength consisted of items measuring the perceived level

of approval or disapproval of anti-doping behavior for five different subjects (i.e. coach, family, close friends, supporters, media). Control belief strength used items to measure the perceived ease or difficulty of “saying no” to doping, acquiring knowledge to ensure supplements and medicines consumed are clean. The outcome evaluation included items measuring the value put by the respondent in the possible outcomes derived from avoiding doping. The motivation to comply measure the participants’ willingness to comply with the instructions and advice from significant others. And the control power measured the perceived power to perform the behavior, doping avoidance.

3.3. Direct measures of TPB constructs

Items for attitude, subjective norm, and PBC of doping avoidance will followed the guidelines according to Ajzen’s (2002). All direct measures were preceded by the common stem: “For me, avoiding the using banned performance-enhancing substances/methods in the forthcoming month is (something)...” For the attitude measure, participants' were asked to respond to four items on seven-point semantic differential scales to the bipolar adjectives like: “worthless - valuable”, “harmful - beneficial”, “bad - good”, and “foolish - wise”. Measures of subjective norm were measured with three items such as, “To avoid doping in the forthcoming year is something that most people who are important to me think that I should do”. PBC was measured with four items like, “To avoid doping in the forthcoming year is possible for me to do”. Lastly, the intention construct

was measured through three items (i.e., “I intend to do avoid doping in the forthcoming year”). Measured for subjective norm, PBC and intention were rated on seven-point Likert-type scales ranging from 1 (“strongly disagree”) to 7 (“strongly agree”).

3.4. Data Collection

The beliefs are usually identified through an open-ended elicitation questionnaire in which people belonging to the target population provide a list of salient factors that affect their behavior in question. This list is subject to a content analysis to identify the more salient or frequently mentioned. However, when the target population is similar to that of a previous research, it is possible to adopt the modal salient beliefs from there. Chan et al., (2015), elicited beliefs from a group of young elite athletes competing at national and international levels in Australia. The researcher for this study believed the target populations do not differ in many aspects, except the geographical location. Therefore, this study adapted these elicited beliefs.

The questionnaire was developed on Google Forms, both in English and Spanish, as these are the most popular languages among professional tennis, and the languages spoken by the researcher. The participants had access to both version of the questionnaire and they were reached through personal electronic message. Before the final distribution of the questionnaire, this was sent to 10 people as a pilot test. Based on the feedback, some modifications were done about the language, the length, and conciseness of the questions. After the final questionnaire was approved by

the respective advisor, it was distributed.

Then, the questionnaire reached more than 600 participants, of whom 243 responded. It is worth mentioning that younger than 17 year-old participants were willing to submit the questionnaire, but the initial target set by the researcher was 17 years-old and older. Participants were not compensated in kind or in monetary terms, the researcher counted just on their good will. At the beginning of the process, all participants were informed briefly about the purpose of the study, the requirements to participate, and procedures. Their anonymity and confidentiality was promised, together with the offer to have their data removed and erased at any point in time, if they wished. Additionally, participants were offered the contact information of the researcher, in case they had any questions or comments. The researcher received some questions about clarification of items, and also received some comments regarding personal situations they have encountered relating the topic and their opinions. For the purposes of this study, these were not included in the manuscript. Lastly, respondents took an average of 8-12 minutes to complete the questionnaire that consisted of 49 questions.

3.5. Data Analysis

Responses from completed questionnaires were first entered into a SPSS for Windows version 26 database for analysis. Cronbach's alpha was used to estimate internal reliability with a goal of achieving an alpha value of 0.70. Means and standard deviations were computed for each item

and construct.

The Structural Equation Modeling was used for this study to analyze the data with IBM SPSS AMOS 21, in order to evaluate the measurement model using a number of indices regarding the convergent and discriminant validity of the hypothesized factors: average variance extracted (AVE), composite score reliability, and Cronbach's alpha (Barclay et al., 1995; Chin, 1998; Henseler et al., 2009). Goodness of fit (GoF) index, averaged R-squared (ARS), were be processed to reveal the global fit of the model. The index of GoF was to be rated as 'satisfactory' based on Tenenhaus et al. (2005) and Wetzels et al. (2009). The indices were used to examine and compare the adequacy of the hypothesized model proposed by French and Hankins (2003):

Model 2 (Expectancy and Value Model): consists of the latent exogenous factors of belief-expectancies (i.e., behavioral belief strength, normative belief-strength, and control belief-strength) together with the also exogenous belief-values (i.e., outcome expectancy, motivation to comply, and control belief-power). Attitude (affected by the sum of the product of behavioral belief-strength and outcome evaluation), subjective norm (affected by the sum of the product of normative belief-strength and motivation to comply), and PBC (affected by the sum of the product of control belief-strength and belief-power) will be correlating their corresponding factors of modal salient beliefs.

The CFA analysis helped establish the extent to which the observed indicators provided good and reliable measures (or not) of the latent constructs of the TPB through the use of the square multiple-correlation estimates. These estimated range from 0 to 1, and the close the SMC value of an indicator variable is to 1, the more reliable it is as a measure of its latent construct.

After establishing the reliability of the indicator variables in their respective latent constructs using the identified measurement model, the researcher specified the structural model. To derive a composite variable of each belief within the TPB, the score of each belief expectancy was multiplied and summed by the corresponding belief evaluation.

Chapter 4. Results

4.1. Descriptive Analysis

The participants in this study were professional and elite tennis players. Completed surveys were obtained from 243 participants older than 17 years old. This specific minimum age was chosen because it is an age where junior players are transitioning into the professional circuit or collegiate tennis. In these levels of competition is when the players are faced by constant and random drug testing. Some of the players, had yet to compete in the professional tour but they had already achieved an elite level of competition at the National Collegiate Athletics Association (NCAA). An increasing number of student-athletes that go to college in the United States, after completion, continue their career in tennis at the professional tours. In addition, the presence of constant and randomized drug testing in collegiate tennis forces these athletes to consider anti-doping efforts. Therefore, they needed to be considered as well.

The age of the participants ranged from 17 to 44 years old. The mean was 24 (standard deviation = 4.5). 91 (37.5%) of the respondents were in between the ages of 21-25, and 84 (34.5%) were between 26-30. These two groups constituted the largest portion of the respondents (see Table 1).

The participants' distribution by gender was constituted by 77.8% (189) of male players and 22.2% (54) female players. Even though the ratio of men and women was not even, it partially reflected the current

distribution of male and female professional tennis players (ITF - ITF Global Tennis Report 2019: Overview, 2020)

The level of competition achieved by the participants was varied. The highest percentages competed at the Futures level (32.9%) and the second highest at the Challenger level (29.6%). These percentages were followed by NCAA player. The Futures levels consists of tournaments where the prize money to be distributed among players is \$15,000 and \$25,000. The challenger level is formed by tournaments with prize money ranging from \$60,000 to \$125,000. The rankings of players at the Futures level ranges from unranked to top 400 in the world. On the Challenger tour, the rankings tend to range from top 400 to top 100 in the world. The ATP and WTA events are for players ranked in the top 50 or 100 and below, and finally, the Grand Slams are for players in the top 125 in the world rankings.

The origin of the respondents was varied, and the higher percentages were from Europe, Central America and Caribbean, and North America, with 67 (27.6%), 53 (21.8%), and 58 (23.9%), respectively. A significant number of the participants (35, 14%) were from South America and smaller numbers were gotten from Africa, Asia and Oceania. Descriptive statistics of the measures are shown in Table 1.

Table 1*Summary of demographic characteristics*

Demographic characteristics	n	%
Gender		
Male	189	77.8%
Female	54	22.2%
Age		
17-20	56	23.2%
21-25	91	37.5%
26-30	84	34.5%
31-35	8	3.2%
>36	4	1.6%
Highest level of competition		
Grand Slam	26	10.7%
WTA/ATP events	29	11.9%
60K,80K,100K/Challenger	72	29.6%
Futures (15K & 25K)	80	32.9%
NCAA (College Tennis)	36	14.8%
Area of origin		
Africa	10	4.1%
Asia	12	4.9%
Europe	67	27.6%
Central America and	53	21.8%
North America	58	23.9%
South America	35	14.4%
Oceania	8	3.3%

4.2. Theory of Planned Behavior and Expectancy-value Model

The Table 1 shows the correlation between variables measured in this study. All values correlations were significant at $p < 0.05$ or $p < 0.01$. The only value that was not significant at $p < 0.01$, was the relationship between motivation to comply and outcome evaluation. Thereafter, all correlations were significant at $p < 0.01$. The variables with the strongest

correlations to intention were the perceived behavioral control ($r = .71$) and attitude ($r = .660$). The variables of motivation to comply and outcome evaluation had the lowest correlations with intention, at $r = .20$ and $r = .32$, respectively.

Table 2

Correlation Matrix of Measured variables

	INT	ATT	SN	PBC	BBS	NBS	CBS	OE	MTC	CP
INT	1									
ATT	.660**	1								
SN	.618**	.769**	1							
PBC	.717**	.745**	.734**	1						
BBS	.603**	.755**	.722**	.825**	1					
NBS	.632**	.788**	.810**	.825**	.882**	1				
CBS	.455**	.493**	.534**	.526**	.553**	.515**	1			
OE	.321**	.310**	.222**	.318**	.331**	.327**	.253**	1		
MTC	.201**	.263**	.391**	.241**	.219**	.276**	.435**	.129*	1	
CP	.405**	.417**	.470**	.480**	.412**	.395**	.555**	.257**	.367**	1

Note. INT = intention; ATT = attitude, SN = subjective norm, PBC = perceived behavioral control, BBS = behavioral belief strength; NBS = normative belief strength; CBS = control belief strength; OE = outcome evaluation, MTC = motivation to comply; CP = control power.

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The analysis for this study was done in two-step approach for Confirmatory Factor Analysis (CFA), followed by a Structural Equation Model (SEM), suggested by Anderson and Gerbing (1998).

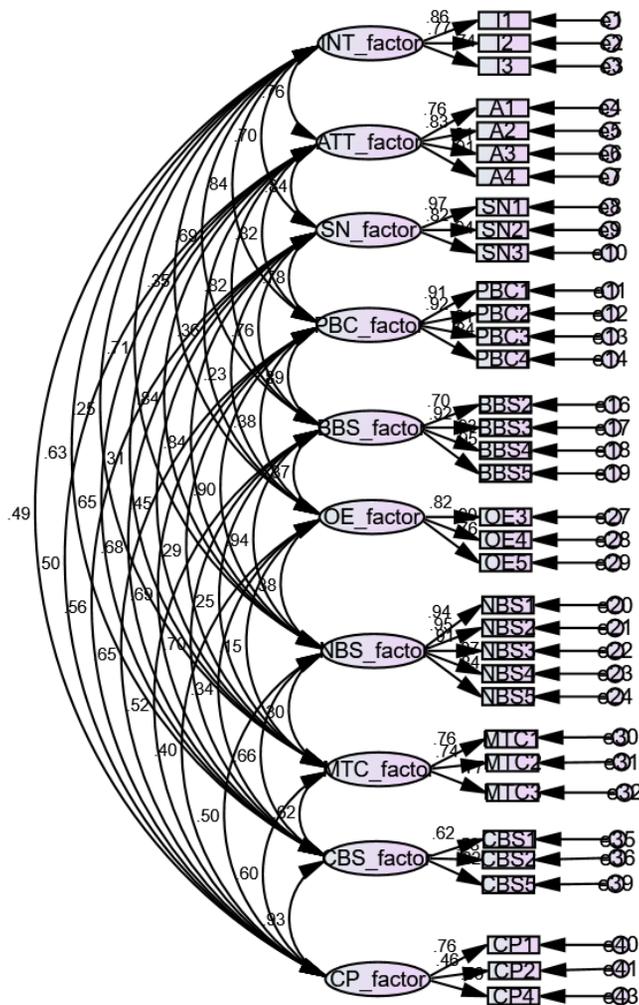
4.3. Confirmatory Factor Analysis (CFA)

The quality of the theoretically derived measurement model was tested through a CFA (see Figure 1). This established the extent to which the observed indicators provided good and reliable measures (or not) of the

latent constructs of the TPB. In the CFA model, the measures for the model fit were chi-square (χ^2) and degrees of freedom (Df), comparative fit index (CFI), Tucker-Lewis index (TLI), goodness-of-fit (GFI), root mean square error of approximation (RSMEA), and χ^2 divided by the degrees of freedom (CMIN/Df), the chi-square ratio.

Figure 2.

Confirmatory Factor analysis of constructs of TPB and its beliefs



The CFA conducted in this study yielded good results. The specified measurement model was identified based on the prescribed SEM model identification indices, results are presented in Table 3. χ^2 was 1219.99 (df = 498), leading to the value of chi-square ratio of 2.45 ($p < 0.01$), close to the values of 2.0 or less indicated for a good fit (Byrne, 2012). The CFI and TLI was higher than or equal to .90, with .91 and .90, respectively. These were considered to have a close fit (Hair, Anderson, Tatham & Black, 1998). The RMSEA showed a measure of 0.07, which indicates a good fit, as it's a value below 0.1 (Hu & Bentler, 1999).

Table 3

Confirmatory Factor Analysis Fit indices

χ^2	df	CMIN/df	CFI	TLI	RMSEA	SRMR
1219.99	498	2.49	.91	.90	0.07	.05

Note. χ^2 = chi-square; df = degrees of freedom; CMIN/Df = minimum discrepancy divided by its degrees of freedom; CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean residual.

Some items were troubling for the fit of the CFA and final model fit because they had low loadings with their respective constructs, indicating that its common variance was smaller than its variance (Anderson & Gerbing, 1988). Most of the items had good loadings on their respective construct (see Table 4). Nevertheless, some items at the belief-expectancy level reflected loadings below .7. The especially troubling items were in the control belief strength construct, where loadings ranged from .65 to .69. Similarly, items in the control power construct were troubling. They ranged

from .46 to .76. A possible explanation for such load loadings could be the extensive variance in the response of the respondents to these items in the questionnaire.

One of the difficulties of assessing values of modal salient beliefs is that these tend to be different within the population. French and Hankins (2003) talk about the advantages and disadvantages of using individual salient beliefs as an alternative to the issue of representation, although this requires more complex and extensive work. In this study, these troubling items of control power measured the perceived ability in terms of knowledge, education, and perception of availability of resources to comply with anti-doping measures.

All Cronbach's alphas, except the alpha of control power construct (.63) were above .7 ranging from .71 to .95. The Cronbach measures exhibited a good internal consistency (see Table 4). The composite score reliability (CR) and the average variance explained (AVE) were computed as measures indicating the reliability and validity of the model. The cutoff value for CR is recommended at .70, and for AVE, .50. The measures for CR ranged from .63 to .96. The control belief strength and control power measures were the only scales with scores below the threshold of .70, at .64. In terms of AVE, all the values were greater than .50. The results of this scale ranged from .59 to .91. The CR and AVE scores imply a considerable convergent validity for most of the factors as proposed by Fornell and Larcker (1981). These results, for the most part, met the criteria put forth in

the literature (Barclay et al., 1995; Chin, 1998; Henseler et al., 2009) for acceptable convergent reliability and validity of the latent factors. The squared-root of the AVE was higher than the mean factor-to-factor correlation of any of the latent factors, successfully passing the test for discriminant validity proposed (Fornell & Larcker, 1981).

Table 4

<i>Item loadings, and reliability and validity indices</i>							
	Item	Loading	M	SD	α	CR	AVE
Independent Variables							
Behavioral	BBS.2	.71					
	BBS.3	.93	6.68	.96	.92	.93	.87
Belief Strength	BBS.4	.90					
	BBS.5	.83					
Normative	NBS.1	.93					
	NBS.2	.96	6.67	1.02	.96	.95	.89
Belief Strength	NBS.3	.90					
	NBS.4	.86					
	NBS.5	.81					
Control Belief Strength	CBS.1	.66	6.62	.76	.64	.71	.67
	CBS.2	.69					
	CBS.4	.65					
Outcome evaluation	OE.3	.83	6.69	1.02	.85	.87	.83
	OE.4	.89					
	OE.5	.77					
Motivation to comply	MTC.1	.77	6.40	1.02	.79	.80	.76
	MTC.2	.74					
	MTC.3	.76					
Control Power	CP.1	.76	6.46	.75	.64	.63	.59
	CP.2	.46					
	CP.4	.56					
Mediating Variables							
Attitude	ATT.1	.72					
	ATT.2	.83	6.60	1.01	.91	.91	.85
	ATT.3	.90					
	ATT.4	.93					
Subjective Norm	SN.1	.96	6.56	1.13	.93	.94	.91
	SN.2	.82					
	SN.3	.95					

	Item	Loading	M	SD	α	CR	AVE
Perceived Behavioral Control (PBC)	PBC.1	.91	6.59	.97	.92	.92	.86
	PBC.2	.92					
	PBC.3	.79					
	PBC.4	.82					
Dependent Variable							
Intention	INT.1	.87	6.58	1.08	.83	.84	.79
	INT.2	.77					
	INT.3	.74					

Note. M = mean; SD = standard deviation; α = Cronbach's alpha; CR= composite score reliability, AVE = average variance extracted

4.4. Structural Equation Modelling (SEM)

The structural model of SEM for this study is shown in Figure 3. The SEM model, for the most part, adequately fitted with the data based on the global goodness of fit indicators. The χ^2 was 27.68 (df = 7), resulting in a CMIN/DF of 3.95, below the threshold of 5. These results exhibit an acceptable and reasonable fit for the hypothetical model and the sample data (Carmines & McIver, 1981, page 80; Marsh & Hocevar, 1985). The CFI was .98 and TLI .95, all above the .90 value for good fit of the model (see Table 5).

Table 5

<i>Model fit measures of SEM model of TPB and Expectancy-values of beliefs</i>						
χ^2	df	CMIN/DF	CFI	TLI	RMSEA	SRMR
8.955	4	2.239	.98	.95	.07	.03

Note. χ^2 = chi-square; df = degrees of freedom; CMIN/Df = minimum discrepancy CFI = comparative fit index; GFI = goodness-of-fit index; TLI = Tucker Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean residual.

With respect to the standardized regression coefficients of the constructs measured in the SEM model, all of them, except subjective norms ($\beta = .09$), had a significant and positive influence on their regressed construct (see Table 6). Of the three directly measured variables of the TPB, the perceived behavioral control had the strongest influence on intention ($\beta = .53$), followed by attitude ($\beta = .27$). These results supported the hypothesis 1 and 3, and reject H2, with respect to the influence and significance of the three directly measured variables of the TPB on intention. Although, the hypothesis was only partially supported, as the Subjective norm had a positive but insignificant effect on intention.

Table 6

<i>Standardized Regression Coefficients – SEM</i>			
		Estimate (β)	<i>p</i>
ATT <---	BbeliefsM	.639	***
SN <---	NbeliefsM	.773	***
PBC <---	CbeliefsM	.551	***
INT <---	ATT	.269	***
INT <---	SN	.091	0.07
INT <---	PBC	.530	***

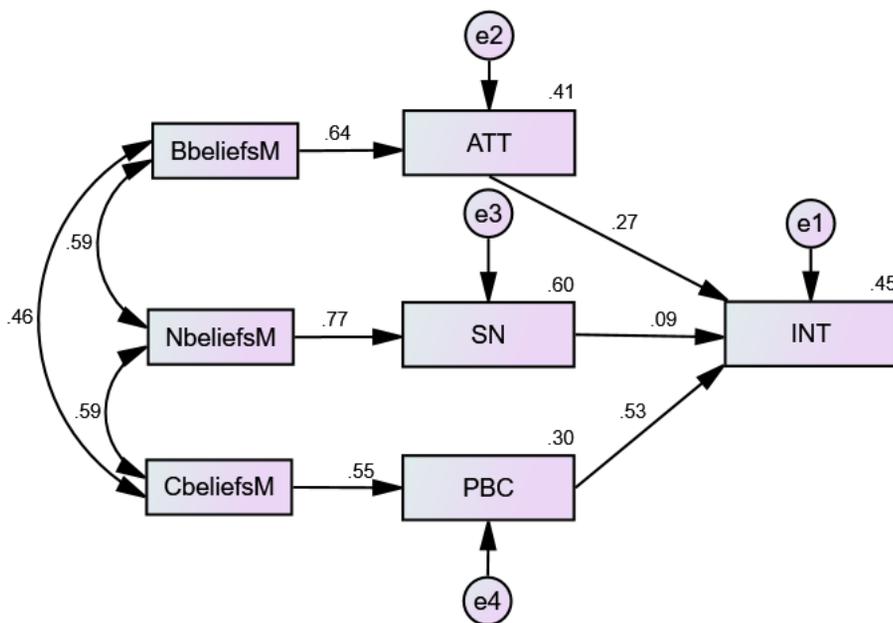
Note. β = standardized regression coefficient; ATT = attitude, SN = subjective norm, PBC = perceived behavioral control; INT = intention; BbeliefsM = Behavioral beliefs composite
 $p^{***} = p < .01$

Of the three indirectly measured variables of belief-expectancies,

the strongest relation was between normative belief-strength and subjective norms ($\beta = .77$), followed by behavioral belief-strength and attitude ($\beta = .64$), and last, control belief-strength with perceived behavioral control ($\beta = .55$). All these results were significant, confirmed the hypotheses 4, 5 and 6, that all three beliefs, behavioral, normative and control, have a positive and significant correlation relationship with attitude, subjective norm, and perceived behavioral control, respectively.

Figure 3

SEM Model for TPB and Belief Expectancy-Values



Similarly, the standardized regression coefficients mentioned above are shown on the SEM model for this study, in Figure 3. In addition, this model shows the correlation for the model. Attitude, subjective norm and PBC predicted intention, as can be seen by the square multiple correlation

($R^2 = .45$), supporting hypotheses H1, H2 and H3. The R^2 for Subjective norm was the highest (.60). For this variable, the predicted variance was given by the perception that certain significant people (i.e. coach, parents, close friends, supporters, media) would likely approve of the athletes' intention to avoid doping. Similarly, their motivation to comply with these significant others, especially when it comes to a sensitive topic such as doping avoidance, is strong.

Chapter 5. Discussion

This study was based on the theory of planned behavior (TPB), and it aimed to explore the relationship between the indirect belief-based measures from modal salient beliefs and the directly measured variables from the theory. Ultimately, the aim of this study was to assess the anti-doping intentions and its impacting factors in professional tennis players.

The TPB states that behavioral, normative and control beliefs, have a significant influence on attitude, subjective norm and perceived behavioral control (PBC), respectively. Therefore, the theory states that the three directly measured variables (i.e. attitude, subjective norm and PBC) have a predicting influence on intention to perform certain behavior, in this case, the avoidance of doping. This process is explained by Ajzen's expectancy-value (1991) model for formulating modal salient beliefs that, in theory, would be considered as indirect antecedents of the social cognitive factors highlighted in the TPB.

The results of the structural equation modelling (SEM) of this study produced results that exhibited acceptable convergent, discriminant, and predictive validity for most of the constructs. Each belief was evaluated through its expectancy and value measures. The behavioral belief strength, normative belief strength, and control belief strength were the expectancy measures. And, the outcome evaluation, motivation to comply, and control power were the value measures (Ajzen, 1991).

This study explored 6 hypotheses (H) to be described below.

5.1. Directly measured variables of the TPB

The perceived control over the anti-doping behavior had the strongest relation to intention, similar to previous results in the literature on TPB in doping (Connor et al., 2013, Ehrnborg & Rosen, 2009; Lamont-Mills & Christensen, 2008; Lentillon-Kaestner & Carnstairs, 2010, Chan et al.,). In this study, the results confirmed the H3, which stated that PBC was to have a positive and significant relationship with anti-doping behavior. This construct is significant in the study of behavior predictions because a person who has high motivation to perform a certain behavior may not actually perform it due to intervening environmental and situations conditions (Ajzen, 2002). Specifically, a tennis player may have a positive attitude towards anti-doping, and his/her significant others (i.e. coach) may support this behavior, but this actor must have the respective external and internal facilitators to perform said behavior (i.e. resources and knowledge about what he/she consumes). Other circumstances may come into play and lead the player toward the path of doping behavior. Sometimes, players are so invested in the end-result of the competition, that they engage in a “win-at-all costs” attitude, and knowingly behave in ways that are unethical and/or illegal. The goal is to accomplish certain goal, and it does not matter what the process is for achieving it. People tend to ignore or judge decisions and procedures differently depending on the outcome, which is a psychological process referred to as outcome bias (Baron & Hershey, 1988;

Allison, Mackie & Messick, 1996; Gino, Moor & Bazerman, 2009).

Professional tennis suffers from income inequalities, the players at the top are paid most of the prize money available and the bigger tournaments continue increasing their prize money. The Tennis Book (2016) estimates that around 500 men and women tennis players have become millionaires from prize money alone. To put the evolution of prize money into perspective, in 1968, the first year of the Open Era, the total prize money of Wimbledon was about \$78,000. In 2015, it had already grown to \$41.5 million. The big monetary prizes are at the highest levels, be it Grand Slams, where players can win \$30,000 for a first-round loss, and at ATP they also earn thousands of dollars for a first-round loss. Compared to that, at the lower levels, players earn around \$100 for a first-round loss, which does not even begin to cover the expenses of traveling and competing. At the challenger level, the level of play is similar to that one at the top level, but still, the ranking points and the prize money sees a big difference. At this point, when players are so close to getting into the “major leagues” and cash in, is when it could be more susceptible to illegal and unethical behaviors like doping. Doping control needs to be enforced at all levels, rather than just the most visible levels to the fans. With this enforcement, the constraints to dope will be more, and facilitators of anti-doping behavior increase.

The attitude towards doping avoidance behavior was significant and positive among professional and elite tennis players, confirming H1. The

more that athletes perceive the advantages of using PES, the more likely they are to develop a strong intention to stay away from banned PED. The reverse is also true, the less a player perceive the advantages of avoiding doping, the more likely they are to consume PED (Goulet et al., 2010). Attitude showed to be a significant predictor of anti-doping behavior, disputing the proposed argument that attitude might be less important in the context of doping avoidance (Chan et al., 2015). The results for attitude as a significant predictor of doping intentions in the literature (Goulet et al., 2010; Lucidiet al., 2008; Ntoumanis et al., 2013, Wiefferink et al., 2008; Zelli et al., 2010) suggest that intentions towards doping are derived from positive attitudes towards it. Similarly, this study concludes that attitude is an important predictor both for anti-doping and doping behavior.

For this study, the subjective norm showed to be non-significant and had an exceptionally low influence on intention to avoid doping, rejecting H2. The results are not too surprising, as the literature on TPB have often found subjective norm to be the weakest, or even non-significant predictor of intentions (Ntoumanis et al., 2014; Ravis & Sheeran, 2003; Armitage & Conner, 2001). Nevertheless, this result cannot be ignored and should not be assumed that the tennis players do not face any peer pressure from significant others. As stated before, the coach and family are usually the only constant company the player has through the length of the season. Due to the high costs of traveling accompanied, players, especially not at the top level, often travel alone. This, for instance, could open possibilities for the

player to consume substances that a doctor or physiotherapist recommends but are on the WADA's list of banned performance-enhancing drugs. The results of this study suggest that players do not require the pressure from others to understand the benefits of avoiding doping, but this is no reason not to continue educating not just the player, but also the personnel that closely work with them.

5.2. Indirectly measured variables of the TPB

The beliefs examined in this study, behavioral, normative and control, were significant and positive influencers of attitude, subjective norm and perceived behavioral control, supporting H4, H5 and H6. According to the TPB, each belief is divided in two parts, expectancy, and value. For example, the behavioral belief is constituted by behavioral belief strength (expectancy) and outcome evaluation (belief value). The first examines the subjective perception of the likelihood of some outcome, and the second studies the subject's approval or disapproval of said outcome (Ajzen, 1985; 1991; Fishbeing & Ajzen, 1975).

The belief expectancies (i.e., belief-strengths) for each of the TPB constructs had significant ($p < 0.01$) and strong correlations with each of its construct, part of the TPB (i.e. attitude, subjective norm and PBC, see Table 2). The control belief-strength was the weaker of the three ($r = .455$). The control beliefs may be based in different subjective factor, such a past experience, the own experiences of acquaintances and friends, and other factors that affect the perceived difficulty of performing the behavior (Ajzen,

1991). The behavioral and normative belief-strengths also had significant but stronger correlations than the control expectancy. Similarly, these correlated better with their respective direct measure of the TPB, attitude and subjective norm. Based on French and Hankins (2003) and Chan et al., (2015), it is possible to measure the effect of beliefs on the directly-measured variables of the TPB just with the belief expectancies. For this study, the researcher considered that measuring the belief-values was important to add completeness into the study.

The specific content of the belief-expectancies in this study covered several aspects related to doping behavior, such as fairness in competition, health-side effects, and punishment from doping. These are frequently characterized as the main components summarizing attitude towards doping (Chan et al., 2015; Goulet et al., 2010; Lucidi et al., 2008; Ntoumanis et al., 2013; Wiefferink et al., 2008; Zelli et al., 2010). The educational campaigns promoting anti-doping behavior by the governing authorities have closely focused on appealing to the attitudes of the athletes (i.e. WADA's "Play True" Campaign) by persuading athletes of the vast array of benefits derived from doping avoidance.

Regarding the normative belief items, athletes reflected a perceived influence of coaches, family, close friends, supporters, and media, in their social environment (Chan et al., 2012). Results showed that the perception of influence was strongest by coaches and family members. Tennis is, mostly, an individual sport, and athletes are used to traveling only with their

coaches or a family member. This entourage supports the athlete the most, and in turn, they are the ones whom the athletes trust the most. Therefore, this close relationship has allowed the players to listen, know and trust the advice of these persons. This has permitted for certain individuals to have a considerable influence on athletes' anti-doping intentions and behavior (Connor et al., 2013; Lentillon-Kaestner & Carstairs, 2010; Lentillon-Kaestner, Hagger & Hardcastle, 2012; Strelan & Boeckmann, 2003).

With respect to the control belief, the items included assessment about the coping strategies, like refusal to dope to consume banned performance enhancing substances or methods, achieving the necessary knowledge about the supplements or medication they consume to ensure their legality, the possibility of having to avoid situations where unintentional doping might occur, and the availability of opportunities to seek information or advice on anti-doping in the sport (Chan et al., 2014; Donovan et al., 2002; Gucciardi et al., 2011). These control beliefs had lower loadings than those of the other two beliefs. Compared to the behavioral and normative belief strengths, the expectancies about the control outcomes vary more within participants. These could be due to the difference in perceptions about situations where it is common to differ among the same group. For instance, some players are more conscious about the need to care for the meat they consume, because in their countries, other athletes, and even some of them have been contaminated with forbidden substances (i.e., Clenbuterol, Trenbolone). Other athletes might have never heard of this

threat or because there have not been related cases in their environment, it is perceived as improbable. Governing authorities, such as ITF, TADP and, ultimately, WADA must attempt to have their anti-doping programmes reach the whole population equally. Players that know someone else that has been sanctioned for doping violations are more likely to perceive higher risks, leading to higher more perceived constraint. The availability heuristic could help explain this phenomenon. This heuristic explains that people make judgements about the likelihood of an event based on how easily an example comes to mind (Tversky & Kahneman, 1974). It is not advisable for the governing authorities to make the cases of the sanctioned athletes more visible for the rest of the athletes, as this may have more career long-term unintended effects on the punished athletes. In fact, authorities, such as TADP, release statements whenever a decision concerning doping in tennis is concluded, and these are accessible for everyone. The media cover the decisions of TADP, ITF and CAS (i.e. for appeals) and people are more likely to find out about the cases due to the coverage of the local or sport specific media. There is little, if anything, to do about this issue or selectiveness in the media. But the governing authorities (i.e. TADP) must use extensive resources to do their best for targeting the entire population with their educational programmes, for athletes and entourage.

The belief values measured in this study, individually, had significant but relatively low loadings with respect to intention, and their respective direct variable. These results are concurrent to Chan et al., (2015),

where the independent measures of outcome evaluation, motivation to comply and control power, were significant and they had a positive relationship, as they ranged from $r = .31$ to $r = .48$. Players seemed to give positively assess the outcomes for each belief. They believed in the goodness of competing fairly against other players or enduring negative side effects of drugs on their health. Also, they value positively the act of complying with significant others, such as coaches, family, and close friends. Lastly, players, in general, felt confident about their ability to “say no” to the consumption of PEDs, their knowledge on the supplements and medications they take, and their ability to seek information regarding anti-doping.

This result suggests that athletes are more willing to avoid doping as the perception of their ability of control over the behavior increases. The questionnaire in this study evaluated the responses to items related to their control, willingness, and feasibility to avoid doping in the forthcoming year. Therefore, it is necessary for the governing authorities to make it difficult for athletes to consume performance enhancing drugs, and to facilitate avoidance and educational situations.

5.3. Limitations and Future Research

Chan et al., (2015) recommended using the belief-expectancy model to measure the effect of modal salient beliefs on the intention to avoid doping. In their study, they measured four different models, as suggested by French and Hankins (2003), and concluded that the belief-expectancy model

was the most efficient and effective way of measuring the effect of beliefs on its variables. In this study, the researcher used the belief expectancy-value model because of the consideration that this model would allow to measure the values the respondents give the outcomes associated to each of its belief-strengths. Due to limited time and resources, the researcher selected to measure only one of the four proposed models by the literature. Future research should consider conducting the whole analysis of the four proposed models to have a better idea of which measurement model is more parsimonious and therefore, provide further support to the literature of the TPB. The quantitative analysis using SEM allowed the researched to test the significance and fit of a single global model. But to measure more models simultaneously, it is necessary to gave further development of statistical methods for contrasting alternative models. This would allow enable stronger generation of evidence to evaluate which target model is superior when comparing models (Chan et al., 2015).

The modal salient beliefs used, possibly did not provide the most accurate representation of the beliefs of all participants. As a theoretical boundary, the modal salient beliefs of a population only represent the accessible beliefs commonly shared among persons (Aiken, 1985). There may be individual beliefs that are unique to each person. The literature (French & Hankins, 2003; Newton, Ewing, Burney & Hay, 2012) proposes that an alternative would be to assess individually elicited salient beliefs and belief-values of their personally valued beliefs. This method would create an

array of problems and complications in data-collection and analysis (e.g. inconsistency in the measurement model), but this is an approach that could be explored by future researchers to bridge the gap between salient beliefs and directly measured variables of the TPB.

Intentions to avoid doping were self-reported and this implies there are certain limitations needed to consider. When the participants are reporting on their own perceptions and behaviors, they are prone to comply with social desirability, leading to underreporting, especially with questions related to ethicality and legality, like doping (Hagger & Chatzisarantis, 2009). Trying to address this threat, this research tried to use safeguards during the data collection, such using anonymous questionnaires, and delivering them individually. The questionnaires were distributed electronically, through personal messages to the participants. There was a possibility to post the questionnaire in wider social media groups where professional players interact, but this was avoided. The researcher considers that by reaching players through personal messages, they would be more willing to complete it individually, at their own time and without the pressure from anyone.

Also, the variables in the present study were focused on the avoidance of doping, which is a socially-acceptable behavior among athletes, so participants could be more predisposed to provide truer answers than if the study had been focused on doping behavior. But the measures of modal beliefs, derived from Chan et al., (2015), were obtained from an open-ended

belief elicitation survey in which the questions asked athletes their beliefs regarding engaging in doping. The participants responded to these questions focused on anti-doping behaviors, even though they were asked about doping behaviors. The change of focus in these responses could have arisen from the social desirability, regardless of the assurances of confidentiality and anonymity that were provided.

The ratio of men and women in this study was not the ideal to consider the sample a fully representative group. Of the 243 respondents, 54 (22.2%) were female. Therefore, future studies should intend to acquire a more equal proportion of both sexes. The reported number of men in professional tennis, compared to women, is higher. Evidence for this is provided by the much larger number of players competing at men events. The size of the main draw of the events might be the same or fairly similar, but especially at the lower levels, the size of the qualifying draws is much larger for men.

In future studies, there could be a more detailed analysis and establishment of relationships between more demographic characteristics and intention, attitudes, subjective norm and PBC regarding anti-doping behavior. With a more in-depth demographic analysis, the practical implications can be also more detailed and provide a better idea for behavioral interventions. Similarly, future research could expand the questionnaire to another popular languages, as the world of professional tennis is global and the language of the questions might not be as easy to

grasp and understand in a second or third language.

5.4. Implications

In terms of theoretical implications, the results of this study support the already well-established theory of planned behavior (TPB) in explaining anti-doping behavior. The TPB model implies that the directly measured variables are strongly correlating with its respective independent belief variable. Therefore, the results are confirming and further supporting the role the beliefs and direct variables have on the intention to perform a behavior.

Regarding practical implications, it has been confirmed that perceived control over a behavior is an important determinant of intention and behavior. Therefore, for the governing authorities, especially WADA and TADP, it is necessary that they continue or increase the strictness in the doping controls. Results have shown that player respond positively, through their anti-doping behavior, to increased perceived barriers in doping. At the same time, it is important that players are provided with the necessary resources to seek for information regarding the use of supplements, medicines and other methods (Geyer et al., 2008). WADA has a thorough educational programme but this may not be reaching a majority of players effectively, because reports show that players keep failing doping tests, and some common excuses are that someone gave them a medicine for a random illness, or someone recommended certain nutritional product.

Similarly, the players that develop of a positive attitude towards

doping are more likely to have a stronger intention to avoid it. The doping in sport governing authorities mentioned above need to appeal to the attitudes of the players with regards to doping. This study has shown that the athletes react positively to the notion of avoiding potential side effects of drugs on their health, the ease in worrying about being caught doing, and further punishment if caught doping. Therefore, it is recommendable that the governing authorities, through their educational and promotional campaigns push these factors as potential outcomes derived from doping behavior.

The anti-doping education should be targeting the early adolescents, because these are the years when attitudes are forming (Backhouse, Patterson & Mckeena, 2012). Related interventions can be useful for this age group and greater attention should be paid to peer influence, because even though social norm's influence was not significant in this study, this could be an important threat.

Finally, the importance of understanding how athletes think about sensitive and relevant issues such as doping, is to have a better idea of the reality for the athlete. Scholars and policy-makers have a point of view that may fail to reflect the reality of the athletes. It is simpler to conduct research or create policy by assuming that we know the reality of the internal and external situations of the athletes, but for this reason, the research focused on psychosocial factors is of great importance for the sport's world.

5.5. Conclusion

This study applied the theory of planned behavior (TPB) to an important aspect of sport, anti-doping, or avoidance of doping. The findings supported the effectiveness of PBC and attitudes in predicting intentions to avoid doping. The subjective norm, as it is common among TPB literature had a positive but insignificant relationship with the anti-doping behavior. Furthermore, the assessment of the expectancy-value model of the TPB showed that the directly-measured variables of the theory are closely associated with the belief-expectancy and belief-values, especially the first (Ajzen, 1985, 1991). This analysis used one of four models proposed to examine the potential effects of the belief-based constructs on direct measures of the TPB and intention ((French & Hankins, 2003)French and Hankins, 2003; Newton et al., 2012). The importance in this is in helping researchers identify the relative contribution of belief-expectancies and belief-values, together in their interaction with attitude, subjective norm and PBC, and subsequently, intentions. Since the three direct measures of the TPB strongly correlated with their respective beliefs, the results imply that professional tennis players are more likely to manage their anti-doping intentions when their subjective beliefs are nudged to perceive the behavior as beneficial, important, possible to achieve, and when they are empowered to control it.

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국 문 초 록

계획행동이론의 확장 모델에 따른 프로 테니스 선수들의 반도핑 행동에 대한 분석

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이 연구는 계획된 행동 이론 (TPB)과 각각의 신념을 사용하여 프로 테니스 선수들의 반 도핑 행동에 대해 더 깊이 이해하는 것을 목표로 한다. 이 연구는 믿음과 태도, 주관적 규범, 인지 행동 통제 (PBC)와의 관계를 측정하기 위해 믿음 기대 값 모델의 효능을 검증하고, 도핑에 대한 의도를 탐색하고자 한다. 이 연구를 측정하기 위해 243 개의 설문지를 수집하였고, 분석은 SEM (Structural Equation Model)을 사용하였다. 그 결과, 신념 구조는 상응하는 사회적인지 변수와 긍정적이고 중요한 연관성을 형성했다. 운동선수들은 PBC가하지 않으려는 의도와 가장 강한 관계를 가지고 있으며, 여전히 긍정적이고 중요한 관계를 가진 태도가 뒤따른다는 것을 발견했다. 또한, 주관적 규범과 의도의 약한 관계로 밝혀졌다. 이 연구의 결과는 프로 테니스 선수들 사이의 도핑 방지 행동이 TPB 프레임 워크를 통해 이해 될 수 있음을 시사하

며, 이는 스포츠의 관리 기관을위한보다 정보에 입각 한 개입을 개발하는 데 사용되어야 할 것이다.

주요어: 반도핑, 계획행동이론, 신념, 프로, 테니스

학 번: 2019-21720