Teammate and Training Partner Support in Recreational Triathletes Doping Attitudes and Concerns

Zac D. Johnson

California State University, Fullerton

Final Report

Research Problem

Recreational triathlon is a popular activity with more than 2 million individual participants annually. Within recreational endurance activities such as triathlon, many people rely on multisport clubs and training partners to achieve their goals. Indeed, many people engage in recreational triathlon for social reasons in addition to the health benefits or competitive goals. However, there is a knowledge gap within recreation triathlon research that explores the role of teammates and training partners and their potential influence on an individual athlete's doping attitudes. Thus, the current study seeks to address two gaps in the literature. Currently, there is a wealth of research that explores the ways that athlete support personnel (ASP) influence athlete doping attitudes and behaviors, but those studies typically focus on coaches, trainers, and physical therapists, rather than teammates, training partners, or peers. Thus, the first aim of this study is to explore what role teammates and training partners, as peers, play in the doping attitudes and behaviors of recreational triathletes. Additionally, though many social-science doping studies suggest trainings for athletes, few have attempted to ascertain whether or not athletes would be willing to partake in such trainings or what athletes themselves would like to experience during those trainings. Thus, the second knowledge gap that this study seeks to address is the whether or not recreational triathletes would be willing to participate in anti-doping education trainings, and what those athletes would like to experience during such trainings. To these ends, the proposed study will gather quantitative data and qualitative data. Quantitative will be gathered and analyzed in accordance with Self-Determination Theory. Qualitative data will be gathered and analyzed in accordance with the grounded theory approach.

Literature Review

Research on doping has typically focused on elite athletes (Blank et al., 2016; Masucci et al., 2019). However, recent work by Dietz and colleagues has begun to explore the experience of recreational multi-sport (i.e., triathlon) athletes (e.g., Schroter et al., 2016). Triathlon participation in the United States alone exceeds 2 million individuals annually (O'Mara, 2019). Further, triathlon represents an area of sport wherein participants have reported different perceptions of doping than related disciplines (e.g., cycling; Morente-Sanchez et al., 2013).

Recreational triathletes are challenged to push their physical and cognitive limits (Laursen, 2011; Heazelwood & Burke, 2011). Youngman and Simpson (2014) noted that because of these demands athletes are often at risk for over-exercising, which comes with an increased risk of injury. Given that athletes report a greater willingness to dope as a result of injury (Whitaker et al., 2014) this presents a problem for recreational triathletes, as recreational athletes often believe that doping is not a harmful practice to them or their sport (e.g., Cox et al., 2022). Indeed, in other sports recreational athletes report a lack of efficacy or knowledge related to doping and doping controls (Cemal et al., 2017; Cox et al., 2022).

While a wealth of social-science doping research has been conducted, three knowledge gaps have been identified. First, research on athlete support personnel often fails to consider the role of peers, such as teammates and training partners, in favor of coaches and trainers (e.g., Goulet et al., 2013; Mazanov et al., 2015). This, despite the importance of peers in the formation of an athlete's doping behaviors and attitudes (Barkoukis et al., 2019; Ohl et al., 2015). Second, much of the social science research on doping has been centered on psychological processes, rather than communicative processes. For example, moral disengagement, perfectionism, and self-efficacy, among other concepts, have been examined with respect to doping (Hodge et al., 2013; Ntoumanis et al., 2014; Zuccehtti et al., 2014). Such work overlooks the importance of communication between individuals that may impact these behaviors. Given the importance of social interactions related to doping (e.g., obtaining, concealing, legitimizing) communication represents a particularly impactful area of research for doping scholars. Finally, while doping

research has called for increased education of athletes, scholars have yet to inductively explore athlete's perceptions of such trainings in both procedure (e.g., how long would you be willing to spend on such a training) and content (e.g., what would you like to learn). Thus, the current research will present the anti-doping education community with potential best practices for reaching recreational athletes.

Thus, the current study uses the theoretical framework of Self-Determination Theory (Ryan & Deci, 2000) to explore how social support (i.e., a largely communicative process) among athletic peers (i.e., teammates and training partners) works in concert with established covariates (e.g., perfectionism, fear of failure) to influence recreational triathletes doping behavior and willingness to engage in anti-doping education. Further, the current study will utilize a grounded theory approach to explore recreational triathletes' perceptions and expectations of potential anti-doping education.

Methods

Procedure

After receiving approval from the IRB participants were solicited primarily via email. Specifically, triathlon clubs, coaches, and race organizers were identified and asked to share the online questionnaire with their network via email or secure messaging (e.g., closed message boards). This was done so that the data would be secured from potential bot and spam attacks through social media outlets. Additionally, participants were recruited in-person at one local Olympic length triathlon; this method of data collected resulted in considerably less data than the online recruitment methods (n = 30).

In order to secure data against potential non-human respondents several other checks were implemented in the data collection process. First, participants were asked to respond to a reCAPTCHA before encountering the survey, those failing the CAPTCHA were not allowed to proceed to the survey. Second, two questions for attention were embedded within the survey (e.g., "for this item please select 'strongly disagree'"); participants who failed these attention checks were deleted from the data set. A single open-ended human response question was included (i.e., "please type the three sports associated with triathlon in the order they most commonly occur during a race,"). Finally, one logic-based question (i.e., "Triathlon is a sport that consists of multiple disciplines. For this question please select "Neutral." You can ignore the rest of this passage. All triathlon bikes include motors.") was included. The final dataset was cleaned and resulted in the removal of 64 responses due to failing either the attention check, human response, or logic-based question, or the open-ended response (n = 7).

After completing the survey participants were directed to a separate questionnaire to provide contact information in order to receive their $10 amazon credit for participating in the study.

Sample

Participants consisted of 542 individuals who identified as recreational triathletes[1]. The sample was mostly comprised of men (62%, n = 253), but women also participated (38%, n = 155)[2]; no individuals selected the option prefer not to answer. The average age of the sample was

[1] Recreational triathletes were defined as individuals who do not make the majority of their income from triathlon.

[2] The total number of 542 participants include any individual who completed at least one full page of the survey. Between 108-140 participants either did not complete the demographic

37.95 (range = 18-74; *SD* = 12.87). On average these individuals have been participating in triathlon for 6.96 years (range = 0-45; SD = 6.89). These individuals spend between 2 and 50 hours training, but on average report a weekly training load of 12.40 hours (*SD* = 6.37). This sample was primarily white (60.5%, *n* = 328), but participants also identified as Asian (5.7%, *n* = 31), Latinx/Hispanic (3.3%, *n* = 18), Mixed (2.2%, *n* = 12), and Middle Eastern (1.1%, *n* = 6), with Black/African-American (*n* = 2), Native American (*n* = 4), Pacific Islander (*n* = 2), and other (*n* = 5) each representing less than 1%.

Instrumentation

Reliabilities, means, and standard deviations can be found in Table 1, alongside a correlation matrix for all observed variables. Unless otherwise noted higher scores reflect a greater perception or sense of that variable.

Social support

Social support among training peers was measured in accordance with the processes outlined by Rees and Hardy (2000). These scholars suggested that researchers should consider social support as a multi-dimensional construct (i.e., emotional support, esteem support, informational support, and tangible support). Multiple scholars have found support for a validated four factor model of social support among athletes in a variety of activities (Rees & Hardy, 2004; Rees et al., 2007). As such this study utilized modified version of social support in sport measure (Rees & Hardy, 2004) was utilized. This 12-item measure assesses social support across four dimensions: emotional, esteem, informational, and tangible. Participants respond on a scale of *not at all (1)* to *a lot (5)*. In this study the measure was adapted to reflect social support received from training partners and peers.

Satisfaction with Social Support

Satisfaction with social support was measured with the satisfaction dimension of the Social Support Questionnaire (SSQ) (Sarason et al., 1983). This scale has been demonstrated as a valid and reliable means of assessing satisfaction with support in athletics (DeFreese & Smith, 2013; 2014; Raedeke & Smith, 2004). This six-item measure assesses an individual's satisfaction with the social support that they have received. Participants respond on a scale of *strongly disagree (1)* to *strongly agree (5)*.

Motivation within Sport

In accordance with Self-Determination Theory (Ryan & Deci, 2000) motivation was measured using Sport Motivation Scale-II (SMS-II; Pelletier et al., 2013), which has been established as reliable and valid across multiple samples (e.g., Barkoukis et al., 2021; Rocchi et al., 2013). This 18-item instrument measures an individual's motivation across six different dimensions: intrinsic, integrated, identified, introjected, external, and amotivation. Participants respond on a scale of *strongly disagree (1)* to *strongly agree (5)*.

Goal Orientation

Goal orientation was measured using an adaptation of the instrument offered by Duda and Nicholls (1992). This goal orientation measure uses 11 items to assess an individual's orientation across two dimensions: task and ego. Higher scores reflect a greater sense of orientation toward achievement because of commitment to the task or in order to serve one's ego. Notably, these two dimensions are not mutually exclusive. Participants respond on a scale of *strongly disagree (1)* to *strongly agree (5)*.

Fear of Failure

---

information or did not reach the demographic component of the survey. Percentages provided are based on those individuals who completed the demographics (*n* = 408), rather than the complete number of 542.

Fear of failure was assessed using the short form of the fear of failure measure (Conroy et al., 2002). This five-item scale assesses an individual's fear of failure across a single dimension. Participants respond on a scale of *strongly disagree (1)* to *strongly agree (5)*.

Doping Avoidance Self-Efficacy

Doping avoidance self-efficacy was measured with the instrument offered by Lucidi et al. (2008). This instrument uses 10-items to assess an individual's self-efficacy to refrain from doping (Lucidi et al., 2008) across a single dimension. Participants respond on a scale of *not capable at all (1)* to *completely capable (7)*.

Attitudes toward doping

Attitudes toward doping measure was measured using the 8-items offered by WADA (Donovan et al., 2015). Participants are presented with the statement "using prohibited stubstances or methods to enhance my performance in the next 12 months would be…" and then make responses on bipolar semantic differential word-pairs (e.g., unethical-ethical, dangerous-safe). Higher scores reflect a more positive attitude toward doping, meaning that lower scores reflect a more positive stance toward anti-doping.

Willingness to engage in anti-doping education

Finally, willingness to partake in anti-doping education training was measured using a single item that read "I would be willing to participate in anti-doping trainings." Participants responded on a five-point Likert-type scale ranging from *very unlikely (1)* to *very likely (5)*.

Open-Ended Responses

For each of the research questions an open-ended question was provided to participants. These questions are available in Appendix A.

Data Analysis

Qualitative data was explored using thematic analysis (Braun & Clarke, 2006). Thematic analysis allows for themes to be identified by researchers from within the dataset, rather than a pre-existing schema. More specifically, data were analyzed utilizing the guidelines offered by Corbin and Strauss (2008). Themes were identified by the recommendations provided by Owen (1984).

Results

Quantitative

Hypothesis one posited that when controlling for goal orientation, fear of failure, and self-efficacy, received social support from teammates and training partners would result in willingness to participate in anti-doping education and positive anti-doping attitudes. In order to test this hypothesis two separate multiple regressions were run.

With respect to positive anti-doping attitudes a hierarchical regression revealed a significant model for the control variables (F (4, 422) = 24.30, $p < .001$, $r^2 = .19$) and the test variables (F (8, 418) = 13.50, $p < .001$, $r^2 = .21$). In the control model only task orientation (B = -.11, $p = .01$) and doping self-efficacy (B = -.36, $p < .001$) were significant. In the test model, no additional significant predictors were found. Notably, multicollinearity statistics among the social support variables did not reveal an issue of multicollinearity. Full regression values can be found in Table 2. Hypothesis 1a was not supported.

When considering an individual's willingness to engage in anti-doping education a hierarchical regression model revealed no significant model (control: (F (4, 337) = 1.06, $p = .38$, $r^2 = .01$; test: (F (8, 333) = 1.63, $p = .11$, $r^2 = .04$). Again, no evidence of multicollinearity was revealed. A full report of this regression can be found in Table 3. Hypothesis 1b was not supported.

Hypothesis two suggested that in accordance with Self-Determination Theory, intrinsic motivation will demonstrate the strongest relationship to positive anti-doping attitudes when

compared with other forms of motivation (e.g., extrinsic motivation). A two-tailed Pearson correlation revealed a significant relationship between doping attitudes and intrinsic motivation (r = -.10, p = .05), identified motivation (r = -.10, p = .03), external motivation (r = .19, p < .001), and amotivation (r = .26, p < .001); doping attitudes were not significantly related to integrated motivation (r = -.08, p = .11) or introjected motivation (r = .05, p = .27). Given that intrinsic motivation and identified motivation both reported the same magnitude of relationship with attitudes toward doping hypothesis two received only partial support[3].

Qualitative

Research Question One

Research question one asked what kinds of topics recreational triathletes would want presented in anti-doping training. Results indicate that there are six different topic areas that recreational triathletes would like to see covered in anti-doping trainings: impacts, doping inclusions, regulation, incidentals, advice, and avoidance.

One theme that emerged in the dataset was that of impact. Many participants claimed that they would like to know more about the potential impact of doping. In particular, participants described the desire to learn about both the physical and mental impacts of doping. The level of detail and specificity requested by participants varied. Some individuals stated that they simply wanted to know about the negative physical impacts of doping (e.g., "what are the negatives," and "what are some of the negative health effects of doping?"). Others asked for more specific descriptions of how doping "harms" or "damages" the body. In addition to the physical impacts of doping, participants also stated that they wanted to know about the mental impacts (e.g., "what are the mental impacts?", "psychological impact of doping"). Across responses coded as "impact" participants indicated a desire to know about how doping impacts individuals in the short- and long-term. For example, one participant simply stated they would like trainings to include "the short- and long-term effects of doping," while others more specifically described a desire to learn about the long-term ramifications of doping.

Participants also claimed that they would like to know what constitutes doping, what is meant by the term doping, or what is included under the umbrella of doping. Specifically, these participants often simply requested that doping trainings include a list of "substances." Others asked for more specific discussions of "what is considered doping?" Another participant asked for trainings to include information about "what is okay, and what is not," and still others asked for information as to what is included under the notion of doping. This theme was distinct from the theme of incidentals (described next) as that theme was viewed as much more specific with regards to the request for trainings regarding (potential) incidental doping.

Many individuals reported wanting to know about where banned substances may be hidden and how to avoid incidental doping. This including wanting to learn about "OTC [over the counter] supplements that may contain banned substances." Another participant asked more specifically for information about what "medicine" they "should be aware of." Others asked for information about the possibility of doping without their knowledge (e.g., "can I be doped without my knowledge?"). Another claimed that they'd like to know about banned substances and "any ways that we might encounter them unintentionally." Similar to this idea of incidentals, was the notion of how an individual's existing supplements, medications, or hormonal therapy

[3] Amotivation revealed the strongest relationship with attitudes toward doping. However, given that Self-Determination Theory defines amotivation as the absence of motivation, rather than a specific type of motivation its correlation value was not considered in reference to the hypothesis, but presented here in order to fully represent the range of motivation offered by Ryan and Deci (2000) in their explication of the theory.

might be considered doping. For example, one participant requested information related to a portal or resource wherein they could make sure new supplements were not banned before they made any changes to their regimen, while others broadly asked for information related to "HRT (hormone replacement therapy)." Another participant stated that they would like for trainings to "take the guess work out of seemingly benign products," and continued on to state that "more clarification on medical approval of certain medicine/hormones would also help." Throughout the dataset individuals provided responses that indicated their commitment to competing clean and to avoiding *incidental* doping.

A fourth theme that emerged from the data was labeled *avoidance*. This theme was recurrent and forceful enough to warrant its own theme, rather than inclusion under another theme (e.g., *incidentals*). Within this theme participants responses requested anti-doping trainings include information about how to avoid doping. Most simply this included responses such as "how can I avoid it?" and "how can I avoid doping?" Another response more pointedly asked about how to resist "peer pressure from teammates." Similarly, one participant stated "how to avoid being pressured to dope," would be a topic they would like to see covered in anti-doping trainings. While yet another stated they would like to see trainings include "how to recognize the pressures that would lead to doping?" Notably, these data included references to both how to avoid both direct appeals to dope and how to avoid incidental doping, but ultimately asked for information about how to practically avoid; comparatively, the *incidental* theme often included information that was more informative, rather than practically applied.

Recognition and response also emerged as a topic that recreational triathletes would like for anti-doping trainings to include. Data labeled *recognition and response* included participant responses that asked both how to recognize an individual who is doping and what to do when someone is doping. Most simply this included responses like "how to recognize when a teammate is doping?" and "how can I recognize doping in others?" These responses also included requests for how an individual should respond if they come to learn that a teammate is doping or if they suspect that someone is doping (e.g., "What to do is someone is doping?"). Another individual stated they'd like to know "how to help friends/training partners." And others stated simply they'd like to know "how to report doping." Again, this theme requested more practical trainings, rather than simply informative.

Relatedly, participants claimed that they wanted to know more about how doping is *regulated*. It appears that many of these individuals are specifically interested in how doping is regulated and testing that occurs at their local races. To that end, this theme was more rooted in a desire for more informative, rather than practical trainings. For example, one participant provided this response "how doping is regulated amongst recreational and pro triathletes." Another stated "How are these screened and who is typically screened, (at what level of competition)?" While others stated more simply that they'd like to know how it is "regulated."

A final theme that emerged was an absence of interest in anti-doping trainings. Many participants said that because they do not dope they are not interested in participating in anti-doping trainings or providing any ideas as to what these trainings should include. While many of these individuals simply responded with "none" or "n/a" others offer unique insight into the mindset of clean recreational athletes. For example, "none…I don't see the value in doping for recreational triathletes," or "none – I have no interest in that training because I don't do it." Another had this to say "I'm not really interested in the training, since I don't think I'm at risk of violating the rules. So I don't think there are any topics I would be interested in seeing." One participant provided a particularly robust description of why a recreational triathlete may not participate in anti-doping trainings "Honestly, I'd never even considered doping. I'd never thought about the potential that others did it, that's not why I'm in the sport. For me it's all

personal, it's a singular person sport and everybody around me is just fodder. I don't care if I'm the fastest or slowest, I'm doing what I want to do at the speed I do it." Likewise, another participant stated "as a recreational athlete, I would NEVER even consider doping. This is supposed to be purely for fun and to dope is just stupid. Because of this, training is n/a to me." In sum, it appears that there are simply some recreational triathletes who are uninterested in anti-doping trainings, due to their perception that they are "clean."

Research Question Two

Research question two asked "what would make you likely to participate in anti-doping trainings?" Participant responses indicated eight unique themes: money, discounts, gear, mandatory requirements, food, social events, education, integrity. More broadly these themes could be classified into extrinsic and intrinsic incentives/motivators.

Extrinsic incentives/motivators included discounts, mandatory requirements, gear, money, food, and social events. These motivators inherently move an individual to participate in anti-doping trainings because of an outside force or reward. Intrinsic incentives/motivators included both education and integrity. These motivators compel individuals to participate in anti-doping trainings for an internalized satisfaction. Importantly, many of these incentives could be combined in order to more effectively compel individuals to participate in anti-doping trainings. Each of the eight themes will now be presented briefly.

External.

Participants often stated that they would be willing to participate in anti-doping trainings if they were given a monetary reward for doing so. This included responses like "payment," "amazon gift cards," and "money." It appears that one way to incentivize participation in anti-doping trainings would be through monetary rewards.

Another motivator was discounted race-fees or memberships. Participants stated they would participate in exchange for "free entry" or "discounts on races." Similarly, participants stated that they would engage in anti-doping training for a discount on their organizational membership (e.g., a club or USA Triathlon).

Gear was also listed as a potential way that anti-doping training could be incentivized. Participants stated that they would participate in exchange for "equipment or SWAG." While another stated they would participate for a "sweet DARE[4] style t-shirt." Others said "hats," and "sunglasses." More interestingly another participant stated that "stickers for bibs", while another said "acknowledgement on race bib," would entice them to participate. Still others stated that "some kind of designation with USAT," would compel them to participate.

Participants also claimed that "mandatory requirements," would lead them to participate in anti-doping trainings. Notably, participants stated that they would participate as a requirement to register for a race or for their USA Triathlon credential. One participant suggested that perhaps a brief training, which could be extended for those interested, to receive their USA Triathlon card would be interesting. Another participant stated that this requirement could also come from a club or team. It seems as though one way to involve individuals would be simply to require a training in order to race.

Social events were also listed as a potential motivator. Participants stated they would be likely to participate if training was held as a "club event." While another stated that "if my club/team had a guest speaker," they would participate in anti-doping trainings. Others stated that they would participate for the networking opportunity.

[4] In the United States DARE is a widely popular drug-resistance campaign aimed toward children. DARE is an acronym standing for drug abuse resistance education.

Another potential incentive that emerged from the data was training support. Several individuals stated that they would be willing to participate in anti-doping training if they, in turn, received some sort of additional support related to the sport and their performance.

Finally, food, snacks, or nutrition were listed by many participants as a potential incentive that would compel them to participate in anti-doping trainings.

Intrinsic.

While many participants listed external incentives or motivators to participate in anti-doping trainings many others provided responses that were more appropriately categorized as intrinsic. Specifically, participants stated that they would be motivated simply for the integrity and honor of working to keep their sport clean. For example, participants stated that a "reminder of the ethics of sport," and "a commitment to fair play and ethical sportsmanship." Finally, others claimed that they would be motivated simply for the educational experience.

Research Question Three

Research question three sought to understand how recreational triathletes would prefer to consume anti-doping trainings. Results indicate that the majority of participants (approximately 75%) would prefer for anti-doping trainings to occur online. Others would still prefer that these trainings occur in-person (approximately 8%), while still others (approximately 7%) stated they had no preference as to online/in-person training and would engage with either. Notably, approximately 10% of participants again stated they would not engage with anti-doping trainings as they do not dope and do not feel it necessary.

Among data related to how participants would prefer anti-doping trainings to occur participants also provided information related to what sorts of materials they would prefer. Specifically, 145 participants (35%) stated generally that they would simply like for these trainings to occur online, while 38 participants stated (9%) stated they would prefer for trainings to occur in-person; 13 participants (3%) said that either online or in-person trainings would be acceptable. Many other participants provided more specific information about the kinds of content that they would like to see. Among these more specified data videos were the most common (n = 102; 25%), but many participants stated that infographics would also be acceptable (n = 47; 11%). Approximately 14 (3%) other statements were coded as "other," these included references to things like emails or testimonials. Again, there was a contingent of participants who stated that it did not matter what form the trainings were presented in, because they are clean athletes they would not attend (n = 43; 10%).

Research Question Four

Research question four asked how long would you be willing to spend on anti-doping trainings? To analyze this data open ended responses were converted to minutes and averaged. If a participant provided a range of time (e.g., 1-2 hours) the average of that time was used as their response. Results indicate that participants who are willing to participate in anti-doping trainings are willing to spend up to 1 hour (M = 65.12 minutes, Range = 5-480 minutes, SD = 73.34) in anti-doping trainings.

Qualitatively some participants stated that they would be willing to do these trainings yearly or at regular intervals. Others again stated that they would do this for longer if it was heavily incentivized ranging from gear giveaways to race admission. Still many others (n = 67; 16%) stated that they would not participate because they do not dope, nor do they intend to (e.g., "I wouldn't be willing to spend any time," "I'm not into doping so I'm not concerned about this subject," "I would never dope intentionally. I do this for fun. I'm slow and do not look like a traditional triathlete and I don't care,").

Discussion

These results have much to offer when considering the doping attitudes of recreational triathletes. It appears that recreational triathletes' doping attitudes are not shaped by their training partners and peers. Likewise, although these recreational triathletes report a generally negative attitude toward doping, they are somewhat willing to participate in anti-doping trainings.

A significant amount of work has focused on the role that support staff plays in shaping the attitudes and behaviors related to doping (e.g., Mazanov et al., 2015). These studies have considered doping in a variety of sports (e.g., rugby, Cox et al., 2022) including triathlon (Masucci et al., 2019). However, these studies, regardless of sports, have typically overlooked the role of potential role of training peers. Thus, this study utilized Self-Determination Theory (Ryan & Deci, 2000) to explore how doping attitudes may be shaped by training peers.

SDT holds that individuals are intrinsically motivated to engage in behaviors when three psychological needs are met. Those needs are autonomy (i.e., ability to perform and make choices independent of others), competence (i.e., holding knowledge), and relatedness (i.e., feeling connected to other people). This study specifically considered how social support from training peers may satisfy the psychological need of relatedness. Findings from our data indicate that while recreational triathletes hold a generally positive attitude toward anti-doping, that is to say a negative attitude toward the act of doping, this attitude is not meaningfully influenced by social support from training partners.

It may be that this non-relationship is a function of the regression models investigated. Based on previous research several control variables were included. As a result only task-orientation and doping self-efficacy were the only significant predictors. Thus, it may be that for recreational triathletes their own personality traits and their own attitudes are more indicative of their doping attitudes. Future research should consider how other personality constructs may shape doping attitudes, rather than interactions and communication received from others.

The lack of relationship between teammate social support and doping attitudes may also be a function of recreational athletes. Data indicated that many participants were not concerned with doping and held strong attitudes against it. However, given the (somewhat) solo nature of triathlon it is possible that these attitudes simply are not impacted by others due to the requirement of completing a race and competing solo. Indeed, endurance athletes regularly discuss their ability to enter into a zen-like state during training that is independent of others (Bridel, 2010; Lee & Drake, 2013). Perhaps in a more collective team environment (e.g., recreational team sports like softball) these attitudes may be more strongly related to social support from teammates. Further, it may be that the nature of recreational triathlon clubs somewhat shapes these relationships. For example, some participants may only belong to a club for one specific reason, such as group training rides or even local affiliation at races (but are otherwise not active). Reasons for club membership may not extend to education such as anti-doping. In the future, research considering the role that peers play in shaping doping attitudes should be mindful of the potential confounds associated with both level of competition and the competition itself.

Additionally, it seems that SDT operates somewhat differently than originally thought in the consideration of recreational triathletes doping attitudes. Intrinsic motivation demonstrated the same magnitude of relationship as identified motivation. While this is consistent with what others have found that when applying SDT to (Tiexeira et al., 2012). However, data from the current study found that extrinsic motivation demonstrated the strongest relationship with doping attitudes. Perhaps it is the nature of recreational triathletes and their own reasons for participating in triathlon that shaped the relationship between motivation and anti-doping attitudes.

Likewise, results from these studies indicate that recreational triathletes' willingness to participate in anti-doping trainings are also unshaped by teammates social support. The lack of

significance related to hypothesis 1b may again be explained due to the nature of recreational triathletes themselves. Indeed, qualitative data indicated that there is a contingent of recreational triathletes who simply are not interested in anti-doping trainings because of their perception that they are "clean." These athletes stated it didn't matter what the incentives were, how short, how convenient, or how engaging anti-doping trainings were they simply were not interested.

Practical implications

While findings related to quantitative data from this study may have somewhat limited utility, the qualitative data have much to offer anti-doping agencies, race directors, and those interested in supporting clean sport. Our data indicate that there are a variety of topics that recreational triathletes would be like to see in anti-doping trainings impact and incidentals emerged as themes that were particularly forceful (Owen, 1984). Thus, when creating anti-doping trainings for recreational triathletes practitioners should make specific efforts to include discussions of these topics. Perhaps videos and infographics related to both the impact of doping and incidental doping may result in significantly more engagement than other topics.

Likewise, recreational triathletes reported an interest in learning how to avoid doping and how doping is regulated. These two topics may also be able to generate significant participation from recreational triathletes. However, such trainings must be careful to not provide information related to doping regulation that may then be used nefariously by athletes. Though certainly these trainings could provide information related to how to avoid doping such as being mindful of the contents of supplements.

These data also indicated that there are many ways to successfully incentivize anti-doping training participation. While there were many topics provided by participants, perhaps the most intriguing of these ideas is that of providing athletes who engage in trainings a sticker for their bib which says something to the effect of "clean athlete." Given the relationship with extrinsic motivation and doping attitudes found among the quantitative data it may be that this simple extrinsic motivator may result in significant amounts of anti-doping trainings.

Limitations and Future Directions

Like any study this was met with some limitations. First, participants were solicited virtually. The primary recruitment strategy was to connect with clubs and coaches and ask them to share the recruitment script with their membership and networks. It is possible that many individuals participated who are not strongly involved with these triathlon clubs. Thus, perhaps our data related to social support were somewhat skewed. In the future, researchers should consider recruiting recreational triathletes by attending club events. Second, the monetary incentive may have enticed individuals who are simply more extrinsically motivated and thus impacted the data related to SDT. In the future researchers should conduct research that is either not-incentivized or incentivized in an intrinsic way.

Moving forward researchers should also consider engaging participants in anti-doping trainings to see the efficacy of the data provided here. For example, future studies may be able to establish that trainings focused on incidental doping are more popular than a broader topic of training such as "what is doping?" Researchers may also be able to partner with race directors or triathlon organizations (e.g., USA Triathlon, Ironman) to test the potential impact of various anti-doping training strategies (e.g., clean athlete stickers, registration discounts). Likewise, these partnerships may foster opportunities to examine concepts related to doping longitudinally.

Researchers may also most specifically explore the contingent of recreational athletes who are uninterested in anti-doping trainings. These athletes may be staunchly opposed to anti-doping training as a function of their own perceptions or reasons for participation in the sport. That is to say, these athletes may not feel like they are competitive enough for doping to matter, but for serious age-groupers these concerns may be more pronounced. These individuals may

also not feel as though doping is a serious risk to their sport. Research designs that afford researchers the opportunity to more deeply explore the convictions of these athletes specifically, could yield meaningful practical implications for anti-doping education efforts.

Conclusion

This study served two functions. First, to explore the potential impact of social support from teammates on anti-doping attitudes and willingness to attend anti-doping trainings. Data indicate that social support from teammates does not impact these attitudes or an individual's willingness. However, social support may still serve an important function in the experience of recreational triathletes; it is possible that being socially connected to others helps to hold them accountable and willing to maintain a "clean" status. Again, this is an area for future research. Second, this study sought to understand how to make anti-doping trainings enticing for recreational triathletes. It seems that many recreational triathletes are willing to participate in these trainings and that they would appreciate information related to a variety of topics. In sum, recreational triathletes, and indeed recreational athletes of all kinds (e.g., runners, cyclists, power lifters), must be considered in anti-doping efforts in order to help increase a commitment to clean sport at all levels and across all disciplines.

References

Blank, C., Kopp, M., Niedermeier, M., Schnitzer, M., & Schobersberger, W. (2016). Predictors of doping intentions, susceptibility, and behaviour of elite athletes: A meta-analytic review. *SpringerPlus*, *5*, 1333. https://doi.org/10.1186/s40064-016-3000-0

Barkoukis, V., Bondarev, D., Lazuras, L., Shakverdieva, S., Ourda, D., Bochaver, K., & Robson, A. (2021). Whistleblowing against doping in sport: A cross-national study on the effects of motivation and sportspersonship orientations on whistleblowing intentions. *Journal of Sports Sciences*, *39*(10)m 1164-1173. https://doi.org/10.1080/02640414.2020.1861740

Barkoukis, V., Brooke, L., Ntoumanis, N., Smith, B., & Gucciardi, D. F. (2019). The role of the athletes' entourage on attitudes to doping. *Journal of Sports Sciences*, *37*(21), 2483-2491. https://doi.org/10.1080/02640414.2019.1643648

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in Psychology*, *3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Bridel, W. F. (2010). "Finish… Whatever it Takes" Considering pain and pleasure in the Ironman Triathlon: A socio-cultural analysis. [Unpublished doctoral dissertation]. Florida State University.

Cemal, G., Celebi, E., Beyazcicek, O., Beyazcicek, E., Tufekci, S., & Ozmerdivenli, R. (2017). The determination of opinions of triathlon athletes on doping and anti-doping matters. *Konuralp Medical Journal*, *9*(1), 63-69. https://doi.org/10.18521/ktd.280117

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences 2nd ed.* Hillsdale, NJ: Erlbaum.

Conroy, D. E., Willow, J. P., & Metzler, J. N. (2002). Multidimensional fear of failure measurement: The performance failure appraisal inventory. *Journal of Applied Sport Psychology*, *14*(2), 76-90. https://doi.org/10.1080/104320025290752

Corbin, J. M., & Strauss, A. L. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Sage.

Cox, L. T. J., Bloodworth, A., & McNamee, M. (2022). Doping in recreational Welsh rugby union: Athletes' beliefs and perceptions related to anti-doping policy and practice. *Performance Enhancement & Health*. https://doi.org/10.1016/j.peh.2021.100211

Cranmer, G. A., & Brann, M. (2015). "It makes me feel like I am an important part of this team": An exploratory study of coach confirmation. *International Journal of Sport Communication*, *8*(2), 193-211. https://doi.org/10.1123/ijsc.2014-0078

DeFreese, J. D., & Smith, A. L. (2013). Teammate social support, burnout, and self-determined motivation in collegiate athletes. *Psychology of Sport and Exercise*, *14*(2), 258-265. https://doi.org/10.1016/j.psychsport.2012.10.009

DeFreese, J. D., & Smith, A. L. (2014). Athlete social support, negative social interactions, and psychological health across a competitive sport season. *Journal of Sport and Exercise Psychology*, *36*(6), 619-630. https://doi.org/10.1123/jsep.2014-0040

Donovan, R., Jalleh, G., & Gucciardi, D. (2015). Social Science Research Package for Anti-Doping Organizations. World Anti-Doping Agency. https://www.wada-ama.org/sites/default/files/resources/files/wada_social_science_research_package_ado.pdf

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology*, *84*(3), 290-299. https://doi.org/10.1037/0022-0663.84.3.290

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175-191. https://doi.org/10.3758/BF03193146

Girelli, L., Cavicciolo, E., Alivernini, F., Manganelli, S., Chirico, A., Galli, F., Cozzolino, M., & Lucidi, F. (2020). Doping use in high-school students: Measuring attitudes, self-efficacy, and moral disengagement across genders and countries. *Frontiers in Psychology*, *11*(663), 1-10. https://doi.org/10.3389/fpsyg.2020.00663

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Piscataway, NJ: Aldine Transaction.

Goulet, C., Valois, P., Buist, A., & Cote, M. (2013). Predictors of the use of performance-enhancing substances by young athletes. *Clinical Journal of Sport Medicine*, *20*(4), 243-248. https://doi.org/10.1097/JSM.0b013e3181e0b935

Hallward, L., & Duncan, L. R. (2019). A qualitative exploration of athletes' past experiences with doping prevention education. *Journal of Applied Sport Psychology*, *31*(2), 187-202. https://doi.org/10.1080/10413200.2018.1448017

Heazelwood, I., & Burke, S. (2011). Self-efficacy and its relationship to selected sport psychological constructs in the prediction of performance in ironman triathlon. *Journal of Human Sport & Exercise*, *6*(2), 328-350. https://doi.org/10.4100/jhse.2011.62.14

Hodge, K., Hargreaves, E. A., Gerrard, D., & Lonsdale, C. (2013). Psychological mechanisms underlying doping attitudes in sport: Motivation and moral disengagement. *Journal of Sport and Exercise Psychology*, *35*(4), 419-432. https://doi.org/10.1123/jsep.35.4.419

Hutchinson, B., Moston, S., Engleberg, T. (2015). Social validation: A motivational theory of doping in an online bodybuilding community. *Sport in Society*, *21*(2), 260-282. https://doi.org/10.1080/17430437.2015.1096245

Laursen, P. B. (2011). Long distance triathlon: Demands, preparation, and performance. *Journal of Human Sport & Exercise*, *6*(2), 247-263. https://doi.org/10.4100/jhse.2011.62.05

Lee, V. R., & Drake, J. (2013). Digital physical activity data collection and use by endurance runners and distance cyclists. *Technology, Knowledge and Learning*, *18*(1), 39-63. https://doi.org/10.1007/s10758-013-9203-3

Lucidi, F., Zelli, A., Mallia, Grano, C., Russo, P. M., & Violani, C. (2008). The social-cognitive mechanisms regulating adolescents' use of doping substances. *Journal of Sports Sciences*, *26*(5), 447-456. https://doi.org/10.1080/02640410701579370

Masucci, M. A., Butryn, T. M., & Johnson, J. A. (2019). Knowledge and perceptions of doping practices and anti-doping education among elite North American female triathletes. *Performance Enhancement & Health*, *6*, 121-128. https://doi.org/10.1016/j.peh.2019.02.001

Mazanov, J., Hemphill, D., Connor, J., Quirk, F., & Backhouse, S. H. (2015). Australian athlete support personnel lived experience of anti-doping. *Sport Management Review*, *18*(2), 218-230. https://doi.org/10.1016/j.smr.2014.05.007

Morente-Sanchez, J., & Zabala, M. (2013). Doping in sport: A review of elite athletes' attitudes, beliefs, and knowledge. *Sports Medicine, 43*, 395-411. https://doi.org/10.1007/s40279-013-0037-x

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.

Ntoumanis, N., Ng, J. Y. Y., Barkoukis, V., & Backhouse, S. (2014). Personal and psychosocial predictors of doping use in physical activity settings: A meta-analysis. *Sports Medicine*, *44*, 1603-1624. https://doi.org/10.1007/s40279-014-0240-4

Ohl, F., Fincoeur, B., Lentillon-Kaestner, V., Defrance, J., & Brissonneau, C. (2015). The socialization of young cyclists and the culture of doping. *International Review for the Sociology of Sport*, *50*(7), 865-882. https://doi.org/10.1177/1012690213495534

O'Mara, K. (2019, August 6). The truth about triathlon participation in the United States. *Triathlete. https://www.triathlete.com/culture/news/the-truth-about-triathlon-participation-in-the-united-states/*

Owen, W. F. (1984). Interpretive themes in relational communication. *Quarterly Journal of Speech*, *70*(3), 274-287. https://doi.org/10.1080/00335638409383697

Petroczi, A. (2002)Exploring the doping dilemma in elite sport: Can athletes' attitudes be responsible for doping? Published doctoral dissertation Greeley, CO: University of Northern Colorado.

Raedeke, T. D., & Smith, A. L. (2004). Coping resources and athlete burnout: An examination of stress mediated and moderation hypotheses. *Journal of Sport and Exercise Psychology*, *26*(4), 525-541. https://doi.org/10.1123/jsep.26.4.525

Rees, T., & Hardy, L. (2000). An investigation of the social support experiences of high-level sports performers. *The Sport Psychologist*, *14*(4), 327-347. https://doi.org/10.1123/tsp.14.4.327

Rees, T., & Hardy, L. (2004). Matching social support with stressors: Effects on factors underlying performance in tennis. *Psychology of Sport and Exercise*, *5*(3), 319-337. https://doi.org/10.1016/S1469-0292(03)00018-9

Rees, T., Hardy, L., & Freeman, P. (2007). Stressors, social support, and effects upon performance in golf. *Journal of Sports Sciences*, *25*(1), 33-42. https://doi.org/10.1080/02640410600702974

Reis, N. A., Kowalski, K. C., Mosewich, A. D., & Ferguson, L. J. (2019). Exploring self-compassion and versions of masculinity in men athletes. *Journal of Sport and Exercise Psychology, 41,* 368-379. https://doi.org/10.1123/jsep.2019-0061

Ring, C., & Kavussanu, M. (2018). The role of self-regulatory efficacy, moral disengagement and guilt on doping likelihood: A social cognitive theory perspective. *Journal of Sports Sciences, 36*(5), 578-584. https://doi.org/10.1080/02640414.2017.1324206

Rocchi, M. A., Pelletier, L. G., & Couture, A. L. (2013). Determinants of coach motivation and autonomy supportive coaching behaviors. *Psychology of Sport and Exercise, 14*(6), 852-859. https://doi.org/10.1016/j.psychsport.2013.07.002

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78. https://doi.org/10.1037/0003-066X.55.1.68

Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: The social support questionnaire. *Journal of Personality and Social Psychology, 44*(1), 127-139. https://doi.org/10.1037/0022-3514.44.1.127

Sanderson, J., Weathers, M., Snedaker, K., & Gramlich, K. (2017). "I was able to still do my job on the field and keep playing": An investigation of female and male athletes' experiences with (not) reporting concussions. *Communication & Sport, 5*(3), 267-287. https://doi.org/10.1177/2167479515623455

Schroter, H., Studzinski, B., Dietz, P., Ulrich, R., Strigel, H., & Simon, P. (2016). A comparison of the cheater detection and the unrelated question models: A randomized response survey on physical and cognitive doping in recreational triathletes. *PLOSOne, 11*. https://doi.org/10.1371/journal.pone.0155765

Teixeira, P. J., Carraca, E. V., Markland, D., Silva, M. N., & Ryan, R. M. (2012). Exercise, physical activity, and self-determination theory: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 9*. https://doi.org/10.1186/1479-5868-9-78

Whitaker, L., Long, J., Petroczi, A., & Backhouse, S. H. (2014). Using the prototype willingness model to predict doping in sport. *Scandinavian Journal of Medicine & Science in Sports, 24*, e398-e405. https://doi.org/10.1111/sms.12148

Wright, A. G. C., Pincus, A. L., Conroy, D. E., & Elliot, A. J. (2009). The pathoplastic relationship between interpersonal problems and fear of failure. *Journal of Personality, 77*(4), 997-1024. https://doi.org/10.1111/j.1467.-6494.2009.00572.x

Youngman, J., & Simpson, D. (2014). Risk for exercise addiction: A comparison of triathletes training for spring-, Olympic-, half-ironman-, and ironman-distance triathlons. *Journal of Clinical Sport Psychology, 8*(1), 19-37. https://doi.org/10.1123/jcsp.2014.0010

Zuccehtti, G., Candela, F., & Villosio, C. (2014). Psychological and social correlates of doping attitudes among Italian athletes. *International Journal of Drug Policy, 26*(2), 162-168. https://doi.org/10.1016/j.drugpo.2014.07.021

Appendix A

1. There are very few anti-doping trainings for recreational triathletes, To that end, what topics would you like to see presented in anti-doping training? For example, “what is doping?” or “how can I avoid doping?” Please list as many topics as you would like.
2. As a recreational triathlete, what would make you likely to participate in anti-doping trainings? Please list as many incentives as you would like.
3. As a recreational triathlete, how would you like for anti-doping trainings to be presented? For example, would you prefer videos or infographics? Online or in-person? For this question, think only of the delivery method, not of content. Please provide as many descriptors as you would like.
4. Finally, how long would you be willing to spend in on anti-doping training?

Table 1. Correlation Matrix, Means, Standard deviations, and Reliabilities

	M	*SD*	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Emotional Support	10.04	3.92	.95	-															
2. Esteem Support	10.53	4.00	.96	.93***															
3. Information Support	8.42	4.10	394	.75***	.72***														
4. Tangible Support	8.67	3.90	.93	.81***	.78***	.88***													
5. Support Satisfaction	23.22	5.01	.95	.73***	.71***	.59***	.61***												
6. Intrinsic Motivation	12.57	1.86	.73	.08	.09	.10*	.12**	.15**											
7. Integrated Moti	12.16	2.47	.84	.11*	.11*	.08	.08	.14**	.34***										

vation																			
8. Introjected Motivation	10.33	2.53	.70	.07	.01	.03	.03	.05	.13**	.36***									
9. Identified Motivation	12.73	1.88	.76	.11*	.12*	.14**	.15**	.19***	.32***	.43***	.24***								
10. External Motivation	5.65	2.35	.74	.12*	.12*	.20***	.17***	.04	-.04	.06	.28***	-.03							
11. Amotivation	5.91	2.37	.65	-.03	-.02	.02	.01	-.11*	-.13**	-.13**	.15**	-.14**	.52***						
12. Fear of Failure	11.94	4.15	.80	-.04	-.02	-.02	-.02	-.14**	-.09	-.01	.31***	.02	.39***	.48***					
13. Task Orientation	26.64	2.99	.82	.15**	.16***	.04	.06	.18***	.29****	.32***	.11*	.39***	-.22***	-.30***	-.13**				
14. Ego Orientation	14.43	4.94	.88	.02	.01	.01	.01	.00	.12	.31***	.29***	.10*	.22***	.25***	.36***	.06			

15. Doping Attitudes	14.47	9.35	.90	-.15**	-.15**	-.11*	-.16**	-.14**	-.10*	-.08	.05	-.10*	.19***	.26***	.17***	-.21**	13**		
16. Doping Self-Efficacy	65.53	9.58	.96	.09	.11*	.01	.07	.12*	.08	.07	-.12*	.12*	-.30***	-.29***	-.23***	.26***	-.18***	-.41***	
17. Willingness to attend anti-doping trainings	2.99	1.56	-	.14*	.13*	.15**	.15**	.09	.14*	.24***	.14*	.22***	.15**	.04	.09	.02	.08	-.12*	.02

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Table 2. Regression Models – Doping Attitudes

Model	Coeff			
Goal Orientation, Fear of Failure, Doping Self-Efficacy → Doping Attitudes	F (4, 422) = 24.30, p < .001, r^2 = .19			
	β	*p*		
Task Orientation	-.11	.01		

Ego Orientation	.05	.27		
Fear of Failure	.05	.26		
Doping Self-Efficacy	-.36	<.001		
Goal Orientation, Fear of Failure, Doping Self-Efficacy, Emotional	F (8, 418) = 13.50, p < .001, r^2 = .21			

Support, Esteem Support, Informational Support, Tangible Support → Doping Attitudes				
	β	*p*		
Task Orientation	-.11	.02		
Ego Orientation	.06	.22		

Fear of Failure	.05	.27		
Doping Self-Efficacy	-.35	<.001		
Emotional Support	-.02	.90		
Esteem Support	.02	.87		
Informational Support	.03	.70		
Tangible Support	-.16	.09		

Table 3. Regression Attitudes – Willingness to attend anti-doping trainings

Goal Orientation, Fear of Failure, Doping Self-Efficacy → Doping Attitudes	F (4, 337) = 1.06, p = .38, r^2 = .01			
	B	*p*		
Task Orientation	.02	.73		

Ego Orientation	.06	.33		
Fear of Failure	.08	.19		
Doping Self-Efficacy	.04	.53		
Goal Orientation, Fear of Failure, Doping Self-Efficacy, Emotional	F (8, 333) = 1.63, p = .11, r^2 = .21			

Support, Esteem Support, Informational Support, Tangible Support → Doping Attitudes				
	β	*p*		
Task Orientation	.01	.82		
Ego Orientation	.05	.42		

Fear of Failure	.09	.14		
Doping Self-Efficacy	.03	.66		
Emotional Support	.08	.57		
Esteem Support	-.04	.80		
Informational Support	.11	.35		
Tangible Support	.02	.90		