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# INTRINSIC VS. EXTRINSIC MOTIVATION AMONG RECREATIONAL CROSSFIT ATHLETES: A PRELIMINARY INVESTIGATION

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**Abstract:**
Research has shown that many types of recreational athletes are intrinsically rather than extrinsically motivated to participate in their sport. **Purpose:** The aim of this study was to determine if recreational CrossFit participants are inclined to be more intrinsically or extrinsically motivated to participate in their sport. **Methods:** Participants were recruited from a local CrossFit gym in Southern Utah where they were provided a QR code linked to the Sports Motivation Scale II (SMS II survey). The SMS II survey assess 6 subscales of motivation regulation (intrinsic, integrated, identified, introjected, external, and non). Each of the 18 SMS II survey questions is scored on a Likert scale of 1-7 on a continuum of "Does not correspond at all" to "Corresponds completely". For the purpose of the study, CrossFit participants were considered to as athletes. **Results:** The SMS II subscale scores were as follows (mean±SD): intrinsic (5.7±1.3), integrated (5.5±1.1), identified (6.2±1.0), introjected (4.6±1.3), external (2.4±1.4), and non (1.7±1.1). The Identified regulation subscale scores were greater than all other subscales scores ($p<0.05$). The Intrinsic and Integrated regulation subscale scores were similar and greater than Introjected, External and Non regulation subscale scores ($p<0.05$). The Introjected regulation subscale scores were greater than the External and Non regulation subscale scores ($p<0.05$). The External regulation subscale scores were greater than the Non regulation subscores ($p<0.05$). **Conclusions:** Within the parameters of this study, it appears that recreational CrossFit participants find motivation within themselves to participate in CrossFit training style exercise sessions.

**Keywords:** sport motivation, CrossFit, sport, athlete, recreational, self-determination

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## 1. Introduction

There are several different points of view in research that discusses motivation. Self-Determination Theory (SDT) and the Sports Motivation-II Scale (SMS-II) are the two focuses of this study (Pelletier et al., 2013; Rodrigues et al., 2020). Motivation has been shown to be a governing factor in success (Teo et al., 2015). Self-Determination Theory has defined what motivation is and is a great asset to sports psychology (Chin et al., 2012). Ivan Pavlov and Sigmund Freud were distinguished contributors to the ideas behind motivation. Pavlov is famous for his study of training a dog to salivate by hearing the sound of a bell (Kretchmar, 2021). Freud believed that motivation was an unconscious energy that can influence behavior and outside forces (Kretchmar, 2021).

In short, motivation is the driver behind performing certain actions. It is a leading foundation of sports performance and achievement. Motivation is important to how athletes experience and respond to sport; whether positive or negative (Williams et al., 2021). The SDT is a prominent theory of motivation that has been used to better understand athlete motivation levels. The SDT is influenced by the nature of an individual's motivation. According to DeFreese, Raedeke, & Smith (2021), the most adaptive motivation is self-determined, meaning that it results from individual choice rather than internal pressures such as guilt or obligation, or external pressures like punishments or rewards. Furthermore, SDT explains that motivation is influenced by the psychological needs of personal control, accomplishment, and connection (DeFreese et al., 2021).

The Sports Motivation Scale (SMS) was created in 1995 by Pelletier, among others, to act as a measurement tool based on the SDT. The SMS assesses five types of behavioral regulations; Intrinsic, Identified, Introjected, External, & Non-Regulation, integrated regulation being an exception. Since the SMS was created, it has been widely used, with a considerable impact on the measurement and understanding of motivation (Li et al., 2016).

Not only did results show validity and consistency, but the SMS was shown to predict persistence in sport training, practice frequency, and the likelihood of participating in physical activity. It was also found to predict positive outcomes like self-esteem, positive emotions, vitality and well-being, coping strategies, sportsmanship, and task versus ego orientations in achievement goals (Pelletier et al., 2013). On the other end of the spectrum, with the non-autonomous subscales, the SMS was used to predict burnout, exercise dependence, and fear of failing, as well as to explain the motivational determinants of dropout in competitive athletes (Pelletier et al., 2013).

The SDT is a present-day framework that is frequently used to understand motivation in the sports and physical education domains. According to the theory, motivational intentions differ in the extent to which they are self-determined or derived from an individual's interests and values. SDT consists of motivation and the basic psychological need for autonomy, connection, and competence (Chin et al., 2012). The theory categorizes motivation into three types: intrinsic motivation, extrinsic motivation,

and amotivation. These three groupings of motivation explain the different reasons why individuals engage in activities (Chin et al., 2012). When athletes are training for, and reaching peak performance, their basic psychological needs must be met. Individuals naturally internalize and integrate ongoing behavioral regulation in training and life (Pelletier et al., 2013). SDT has been applied to develop an understanding of human motivation, engagement, and persistence in various forms of health, educational, occupational, and organizational settings. Within SDT, there is a distinction made between motivation and intention. Motivation focuses on the "why," or the reasons behind the behavior, whereas intentions refer to the "what," or the objective of the intention (McLachlan & Hagger, 2011). A model to describe SDT human motivation has been created; Social Factors Psychological issues Types of Motivation Cognitive, Affective, and/or Behavioral Consequences. This model explains that self-determined motivation causes cognitive, affective, and behavioral consequences for sports or intentions (Chicote-López et al., 2017).

Mclachlan & Hagger (2011) reviewed multiple studies, creating a meta-analysis, supporting the importance of autonomous motivation relative to controlled motivation. The Mclachlan & Hagger (2011) meta-analysis examined the effects of choice, self-determined motivation, intrinsic motivation, and extrinsic motivation. The opportunity of choice being presented enhanced intrinsic motivation, effort, perceived competence, and task performance. The Mclachlan & Hagger (2011) meta-analysis identified autonomous forms of motivation as significant predictors of physical activity behavior. Within SDT, a distinction is made between motivation and intentions. Intention gives a direction and motivation drives the direction (McLachlan & Hagger, 2011).

Comparably, more current studies have found that psychological obstacles that can impact athletic performance include:

- Anxiety,
- Lack of confidence,
- Distraction,
- Failure to control emotions,
- Pressure,
- Current situation for the game,
- Interpersonal situations,
- Physiological conditions,
- Aggression,
- Stress,
- Goal setting,
- Level of desire,
- Self-conception,
- Form of attention,
- Mental strength,
- Cohesiveness,
- Observation.

If the above variables are not sufficiently controlled, athletic performance declines remarkably (Park et al., 2020).

Domuschieva-Rogleval & Yancheva (2021) described an athlete's satisfaction as strongly correlated with quality of life, and attitude towards the organization and management of the athlete's team. Satisfaction is a necessary condition for an athlete's participation in sports, as well as a major contributing factor in a successful, long-term career. Lack of satisfaction can lead to the redirection of an athlete to different areas of activity that contain higher potential for satisfaction and therefore, success. Satisfaction with the activity of a given sport is closely related to an objective assessment of the athlete in a variety of areas such as: knowledge, life experience, physical health, mental health, public recognition, social contacts, satisfaction, inner harmony, and personal cultivation (Domuschieva-Rogleva & Yancheva, 2021).

Over the years the SMS evolved to SMS-6 blending a new subscale for measuring integrated regulation. In 2013, Pelletier et. al, brought to fruition the most current SMS scale, the SMS-II. The SMS-II continued to evolve the content of earlier versions of the SMS. Adjustments included: the inclusion of an integrated regulation subscale, replacement of problematic items, reduction of the number of items per subscale, and reduction of the three intrinsic regulation subscales to a single three-item subscale (Pelletier et al., 2013: Rodrigues et al., 2021). Questions and the Likert-scale used in the SMS-II are listed in the results section.

Using the SMS-II can be helpful for coaches and practitioners who wish to optimize performance and well-being such as sports participation, retention, and performance. Recent studies have suggested that assessing an athlete's motivation is crucial to a coach's engagement and connection with an athlete and their well-being, as well as their self-determined motivation (Monteiro et al., 2020; Rodrigues et al., 2020).

The SMS-II has shown better readability, face validity, and consistency with its theoretical basis compared to the original version as shown in the data referenced in this research (Smohsa et al., 2021). Evidence shows that the SMS-II has validity and reliability in a variety of languages and cultures (Li et al., 2016; Monteiro et al., 2020; Pelletier et al., 2013; Rodrigues et al., 2020; Rodrigues et al., 2021; Walczak & Tomczak, 2019). As the SMS-II has been used in many countries, it has allowed for the comparison of motivational conditionings of sports activity, and for making an attempt to discover the similarities and differences between various socio-cultural contexts (Walczak & Tomczak, 2019). Moreover, statistical data shows that the SMS remains the most often cited questionnaire under review among other motivational measures in the sports domain (Walczak & Tomczak, 2019).

A more recent addition to the sport domain is CrossFit. CrossFit is a high-intensity functional training program that is swiftly growing across the world (Claudino et al., 2018). Founded by Greg Glassman in 2000, its popularity has increased to over one hundred different countries since then (Claudino et al., 2018). The workouts programed for participants are typically a high-intensity workout that involves a variety of functional movements using components of Olympic weightlifting, gymnastics, and

cardiovascular exercises. These movements are meant to be completed quickly, repeatedly, and often repeated numerous times to complete the workout of the day (WOD) (Claudino et al., 2018).

Limited research has been obtained regarding participation in the sport of CrossFit (Claudino, et. al 2018). Some of the research includes grip strength (Haynes & DeBeliso, 2019), the effect of grit (Cazayoux & DeBeliso, 2019), body composition and physiological aspects, injury risk, life and health, and psycho-social behavior (Claudino et al., 2018). With that said, an examination of the motivation of CrossFit participants to engage in their sport appears warranted. It should be noted that CrossFit is considered as "*the sport of fitness*" (Gerhart, 2013). As such we consider those who participate in CrossFit on a recreational basis as CrossFit athletes.

CrossFit athletes may have the drive to perform well, but what is it rooted in? Are these athletes performing well because they are internally, or externally motivated? Or rather, is it a combination of both? Hence the purpose of this study was to assess the motivation(s) of recreational CrossFit athletes as assessed by the SMS-II.

**Figure 1:** CrossFit athletes: "the sport of fitness". (Image courtesy of Michael Cazayoux)

## 2. Methods and Materials

### 2.1 Participants

Recreational CrossFit athletes were gathered as the sample population for this research. The participants were at least 18 years or older, with at least 3 months of CrossFit experience. Participants were recruited from a local gym in Cedar City, Utah however, the invitation was open to any experienced recreational CrossFit athlete who wanted to participate. Participants were recruited by public announcements, flyers posted in the gym, and a link posted in the SugarWod application. Participation was voluntary and informed consent was gathered at the beginning of the survey. The study was approved by a University IRB committee (IRB approval: #02-122022a).

### 2.2 Instruments and Apparatus

The platform used for the investigation was an online Google Form Survey. The survey asked the participants the 18 questions contained in the Sport Motivation Scale II (SMS II). Google Form Survey was linked on a QR code posted on a flyer and in the SugarWod application. The SugarWod app, is a workout application for streamlining functional fitness that is used by athletes and coaches to communicate the workout of the day and/or announcements need to be delivered. The SugarWod app is readily available for download to iOS and Android devices.

### 2.3 Procedures

On December 7, 2023, the Google Form Survey was posted on the SugarWod application and QR code was posted on flyers in the local gym where participants were gathered. The anonymous survey included information about the purpose of the study, the inclusion criteria, and how long the survey would be available for. Athletes were only allowed to complete the anonymous survey one time and the survey remained available for 2 weeks.

### 2.4 Design

Descriptive statistics were used to analyze the data. Mean, standard deviation and percentages were calculated based on the number of responses received for each answer per question and for each SMS II regulated construct. Likewise, the six regulated subscale scores of the SMS II were also calculated and presented. A repeated measure ANOVA with Bonferroni post hoc t-tests was utilized to explore potential differences between the SMS-II subscale scores.

## 3. Results

There were 20 respondents to the survey with all 20 of these individuals completing the survey over the course of two weeks. The SMS-II subscale questions and scores are displayed in Tables 1-6. The subscale scores mean and standard deviations are presented in Table 7. The Identified regulation subscale scores were greater than all other subscales scores ($p<0.05$). The intrinsic and integrated regulation subscale scores were similar and greater than introjected, external, and nonregulation subscale scores ($p<0.05$). The introjected regulation subscale scores were greater than the external and nonregulation subscale scores ($p<0.05$). The external regulation subscale scores were greater than the nonregulation subscores ($p<0.05$).

**Table 1:** Athlete Responses to Intrinsic Regulation Questions

| **Intrinsic Regulation** | **Responses** | |
|---|---|---|
| | **n=20** | **%** |
| **Because it is very interesting to learn how I can improve** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 1 | 5 |
| Corresponds a little | 0 | 0 |
| Corresponds moderately | 2 | 10 |
| Corresponds quite a bit | 3 | 15 |
| Corresponds quite a lot | 3 | 15 |
| Corresponds completely | 11 | 55 |
| **Because I find it enjoyable to discover new performance strategies** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 1 | 5 |
| Corresponds a little | 2 | 10 |
| Corresponds moderately | 0 | 0 |
| Corresponds quite a bit | 3 | 15 |
| Corresponds quite a lot | 6 | 30 |
| Corresponds completely | 8 | 40 |
| **Because it gives me pleasure to learn more about my sport** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 1 | 5 |
| Corresponds a little | 0 | 0 |
| Corresponds moderately | 1 | 5 |
| Corresponds quite a bit | 3 | 15 |
| Corresponds quite a lot | 7 | 25 |
| Corresponds completely | 8 | 40 |

**Table 2:** Athlete Responses to Integrated Regulation Questions

| **Integrated Regulation** | **Responses** | |
|---|---|---|
| | **n=20** | **%** |
| **Because practicing sports reflects the essence of who I am** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 0 | 0 |
| Corresponds a little | 2 | 10 |
| Corresponds moderately | 2 | 10 |
| Corresponds quite a bit | 3 | 15 |
| Corresponds quite a lot | 6 | 30 |
| Corresponds completely | 7 | 35 |
| **Because participating in sport is an integral part of my life** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 0 | 0 |
| Corresponds a little | 1 | 5 |
| Corresponds moderately | 3 | 15 |
| Corresponds quite a bit | 3 | 15 |
| Corresponds quite a lot | 6 | 30 |
| Corresponds completely | 7 | 35 |
| | | |

| **Because through sport, I am living in line with my deepest principles** | | |
|---|---|---|
| Does not correspond at all | 1 | 5 |
| Corresponds very little | 0 | 0 |
| Corresponds a little | 1 | 5 |
| Corresponds moderately | 3 | 15 |
| Corresponds quite a bit | 4 | 20 |
| Corresponds quite a lot | 6 | 30 |
| Corresponds completely | 5 | 25 |

**Table 3:** Athlete Responses to Identified Regulation Questions

| **Identified Regulation** | **Responses** | |
|---|---|---|
| | n=20 | % |
| **Because I found it is a good way to develop aspects of myself that I value** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 0 | 0 |
| Corresponds a little | 1 | 5 |
| Corresponds moderately | 0 | 0 |
| Corresponds quite a bit | 1 | 5 |
| Corresponds quite a lot | 7 | 35 |
| Corresponds completely | 11 | 55 |
| **Because I have chosen this sport as a way to develop myself** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 0 | 0 |
| Corresponds a little | 1 | 5 |
| Corresponds moderately | 1 | 5 |
| Corresponds quite a bit | 2 | 10 |
| Corresponds quite a lot | 6 | 30 |
| Corresponds completely | 10 | 50 |
| **Because it is one of the best ways, I have chosen to develop other aspects of my life** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 0 | 0 |
| Corresponds a little | 1 | 5 |
| Corresponds moderately | 1 | 5 |
| Corresponds quite a bit | 1 | 5 |
| Corresponds quite a lot | 10 | 50 |
| Corresponds completely | 7 | 35 |

**Table 4:** Athlete Responses to Introjected Regulation Questions

| **Introjected Regulation** | **Responses** | |
|---|---|---|
| | **n=20** | **%** |
| **Because I would feel bad about myself if I did not take the time to do it** | | |
| Does not correspond at all | 1 | 5 |
| Corresponds very little | 4 | 20 |
| Corresponds a little | 3 | 15 |
| Corresponds moderately | 4 | 20 |
| Corresponds quite a bit | 1 | 5 |
| Corresponds quite a lot | 6 | 25 |
| Corresponds completely | 2 | 10 |

| | | |
|---|---|---|
| **Because I would not feel worthwhile if I did not** | | |
| Does not correspond at all | 6 | 30 |
| Corresponds very little | 3 | 15 |
| Corresponds a little | 2 | 10 |
| Corresponds moderately | 2 | 10 |
| Corresponds quite a bit | 3 | 15 |
| Corresponds quite a lot | 2 | 10 |
| Corresponds completely | 2 | 10 |
| **Because I feel better about myself when I do** | | |
| Does not correspond at all | 0 | 0 |
| Corresponds very little | 0 | 0 |
| Corresponds a little | 0 | 0 |
| Corresponds moderately | 1 | 5 |
| Corresponds quite a bit | 2 | 10 |
| Corresponds quite a lot | 5 | 25 |
| Corresponds completely | 12 | 60 |

**Table 5:** Athlete Responses to External Regulation Questions

| **External Regulation** | **Responses** | |
|---|---|---|
| | **n=20** | **%** |
| **Because people I care about would be upset with me if I didn't** | | |
| Does not correspond at all | 11 | 55 |
| Corresponds very little | 7 | 35 |
| Corresponds a little | 1 | 5 |
| Corresponds moderately | 0 | 0 |
| Corresponds quite a bit | 0 | 0 |
| Corresponds quite a lot | 1 | 5 |
| Corresponds completely | 0 | 0 |
| **Because I think others would disapprove of me if I did not** | | |
| Does not correspond at all | 11 | 55 |
| Corresponds very little | 5 | 25 |
| Corresponds a little | 2 | 10 |
| Corresponds moderately | 1 | 5 |
| Corresponds quite a bit | 1 | 5 |
| Corresponds quite a lot | 0 | 0 |
| Corresponds completely | 0 | 0 |
| **Because people around me reward me when I do** | | |
| Does not correspond at all | 4 | 20 |
| Corresponds very little | 4 | 20 |
| Corresponds a little | 4 | 20 |
| Corresponds moderately | 4 | 20 |
| Corresponds quite a bit | 1 | 5 |
| Corresponds quite a lot | 3 | 15 |
| Corresponds completely | 0 | 0 |

**Table 6:** Athlete Responses to Non Regulation Questions

| Non Regulation | Responses | |
|---|---|---|
| | n=20 | % |
| **I used to have good reasons for doing sports, but now I am asking myself if I should continue** | | |
| Does not correspond at all | 12 | 60 |
| Corresponds very little | 4 | 20 |
| Corresponds a little | 2 | 10 |
| Corresponds moderately | 0 | 0 |
| Corresponds quite a bit | 0 | 0 |
| Corresponds quite a lot | 2 | 10 |
| Corresponds completely | 0 | 0 |
| **I don't know anymore; I have the impression that I am incapable of succeeding in this sport** | | |
| Does not correspond at all | 11 | 55 |
| Corresponds very little | 6 | 30 |
| Corresponds a little | 1 | 5 |
| Corresponds moderately | 1 | 5 |
| Corresponds quite a bit | 1 | 5 |
| Corresponds quite a lot | 0 | 0 |
| Corresponds completely | 0 | 0 |
| **It is not clear to me anymore; I don't really think my place is in sport** | | |
| Does not correspond at all | 15 | 75 |
| Corresponds very little | 5 | 25 |
| Corresponds a little | 0 | 0 |
| Corresponds moderately | 0 | 0 |
| Corresponds quite a bit | 0 | 0 |
| Corresponds quite a lot | 0 | 0 |
| Corresponds completely | 0 | 0 |

**Table 7:** Regulation Scale Scores

| | Regulation Construct | | | | | |
|---|---|---|---|---|---|---|
| | **Intrinsic** | **Integrated** | **Identified** | **Introjected** | **External** | **Non** |
| **Questions** | 3,9,17 | 4,11,14 | 6,12,18 | 1,7,16 | 5,8,15 | 2,10,13 |
| **Mean** | 5.7** | 5.5** | 6.2* | 4.6*** | 2.4**** | 1.7 |
| **SD** | 1.3 | 1.1 | 1.0 | 1.3 | 1.4 | 1.1 |

* The Identified regulation subscale scores were greater than all other subscales scores ($p<0.05$).
**The Intrinsic and Integrated regulation subscale scores were similar and greater than Introjected, External and Non regulation subscale scores ($p<0.05$).
***The Introjected regulation subscale scores were greater than the External and Non regulation subscale scores ($p<0.05$).
****The External regulation subscale scores were greater than the Non regulation subscores ($p<0.05$).

## 4. Discussion

The purpose of the study was to determine if recreational CrossFit athletes are more extrinsically or intrinsically motivated to be successful in performance. While a research hypothesis was not proposed, it was suspected that CrossFit athletes would exhibit

greater intrinsic regulation as assessed by the SMS-II and its associated subscales of regulation.

The SMS-II scale prompts questions asking about intrinsic motivation, extrinsic motivation, sub-scales of extrinsic motivation which include; integrated, identified, introjected, external, and lastly amotivation. Participants were asked to answer all eighteen questions as openly and honestly as possible to determine how recreational CrossFit athletes are motivated. The scores for each subscale of regulation constructs were normalized to the 1-7 Likert scale: 1. "Does not correspond at all" to 7. "Corresponds completely".

Table 7 indicates that the subscale of identified is significantly greater than all other subscales ($p<0.05$) and that the subscales of intrinsic and integrated are similar ($p>0.05$) and significantly greater than the subscales of introjected, external, and nonregulated (i.e. amotivated) ($p<0.05$). However, the subscales of identified, intrinsic, and integrated are qualitatively very similar ranging from "corresponds quite a bit" to "corresponds quite a lot". Although the subscales of integrated and identified are considered as extrinsic motivation; integrated and identified regulations are known to be rooted in internal motivation (Pelletier et al., 2013). As such, broadly speaking, the results presented in Table 7 suggest that CrossFit athletes are more likely to participate in this sport for personal fulfillment, growth, and challenge rather than for recognition, social approval, or praise (i.e. internal motivation). The paragraphs to follow will focus more specifically on each subscale construct.

While the largest mean and smallest standard deviation of all categories were identified regulation; being a 6.2 mean and 1.0 SD. Approximately 90-95% of the responses closely related to this type of regulation, agreeing "quite a bit" to "completely". Within the bounds of identified regulation individuals don't seek external reward for their internal goals. These data suggest that although participants have a lot of intrinsic motivations for self-fulfillment, growth, etc. they could also appreciate the external rewards such as gaining muscle, losing weight, lifting more weight, etc.

Regarding intrinsic regulation, across the 3 questions (Table 1), 80-85% of the responses ranged from agreeing "quite a bit" to "completely". Intrinsic motivation has been defined as performing actions or activities for internal rewards such as feelings of pleasure, interest, and satisfaction that are directly extracted from participation (Chin et al., 2012). This type of motivation would endorse the development of personal interests, aspirations, and growth. The datum collected in this study specific to intrinsic regulation suggest that individuals are intrinsically motivated to engage in recreational CrossFit.

The athlete's responses to integrated regulation questions are presented in Table 2. Regarding integrated regulation, across the 3 questions (Table 2), 75-80% of the responses ranged from agreeing "quite a bit" to "completely". Hence suggesting that the participants identified with integrated regulation to a strong degree. Although integration regulation falls under the extrinsic motivation umbrella, the source is rooted internally and is the closest to intrinsic regulation. Integrated regulation is considered to be the most autonomous and occurs when the behavior of an individual is not only seen

as valued, but coincides with life goals, objectives, and needs. Integration regulation also closely relates to the SDT because it reflects consistency with different aspects of an individual's identity, beliefs, values, and emotions (Pelletier et al., 2013).

The athlete's responses to introjected regulation questions are presented in Table 4. Regarding introjected regulation, across the 3 questions (Table 4), 35-95% of the responses ranged from agreeing "quite a bit" to "completely". Hence suggesting that some of the participants identified with introjected regulation to some extent. Introjected regulation is a subcategory of extrinsic motivation. The source of introjected regulation is somewhat externally and internally embedded. Introjected regulation is driven by worthiness and/or shame and guilt avoidance. This type of regulation is more ego-driven, including internal rewards and punishments. Introjected regulation is driven by a dominance in an outcome of performance however, this may cause a low sense of self-determination. (Pelletier et al., 2013).

Responses to external regulation questions, given by athletes, are displayed in Table 5. External regulation is the final subcategory of extrinsic motivation. The source of external regulation is externally embedded with external rewards, punishments, and compliance. This type of regulation is driven or controlled by instances of behavior that are fear driven (Pelletier et al., 2013). Extrinsic motivation has an outward focus and is directed toward outcomes such as fame, wealth, and a desirable image. Relief of boredom is likely to represent an extrinsic motivator, as it can relate to alleviation or avoidance of a negative affective state instead of seeking fulfillment, challenge or personal growth (McLachlan & Hagger, 2011). Regarding external regulation, across the 3 questions (Table 5), 40-90% of the responses ranged from "does not correspond at all" to "corresponds very little". Further, no participants could identify as "agree completely" with any of the external regulation questions. In other words, participants of this study do not participate in the sport of recreational CrossFit for the benefit of external reward.

The responses to non-regulation questions are displayed in Table 6. Non-Regulation is considered amotivation. Amotivation is when an individual has a lack of autonomy with no drive and struggles to have needs met. This type of regulation comes with a reduction in motivation levels due to lack of control, incompetence, or having no intended result (Chin et al., 2012). Within amotivation there is an absence of purpose to engage in certain behavior. These feelings are typically partnered with feelings of incompetence and a lack of connection between an individual's behavior and the expected outcome. Some individuals may display a sense of helplessness which can increase the likelihood of withdrawing from the activity (Domuschieva-Rogleva1 & Yancheva, 2021). Regarding non-regulation, across the 3 questions (Table 6), 0-10% of the responses ranged from agreeing "quite a bit" to "completely". Further, no participants could identify as "agree completely" with any of the non-regulation questions. However, there were a couple of individuals who did correspond with the statements to "some degree". With that said, we view the datum gathered as broadly indicating that the participants did not identify with non-regulation.

The results of the current study are comparable to prior research suggesting that individuals participate in CrossFit for internal motivations (Ayar, 2018; Bycura et al., 2017; Dominski et al., 2020; Fisher et al., 2016). The internal motivations such as personal enjoyment, challenge, and feeling connected with others are also consistent with the findings of the current study (Bycura et al., 2017; Dominski et al., 2020).

## 5. Limitations

It is assumed that all athletes complete the SMS II fully and honestly to reveal accurate results shown through both the training and competitive environments of the study. The delimitation of this study is the level of fitness for the athletes. This study is not focused on the difference between elite and novice CrossFit athletes but examines the internal and external motivators of any recreational CrossFit athlete. The age of the athletes participating in this study vary, starting from the age of eighteen and extending up to sixty-five. The skill levels of these athletes were very diverse (however it should be noted that the SD of the SMS-II subscale scores ranged from 1.0-1.4). Other limitations of this study include a relatively small sample size of 20 individuals, as well as a single geographical location where athletes train; Retro Fitness Cedar City, UT.

## 6. Areas for Future Research

Although there is a variety of research that has been conducted regarding CrossFit athletes and motivation, this study allows for a small, yet integral piece of information to capitalize upon and pursue opportunities for beneficial future research. Future research regarding CrossFit participants and motivation should include variables such as: gender, age, elite status, performance outcomes, and multiple Box locations. A small understanding that motivation, intrinsic and extrinsic, plays a fundamental role in recreational CrossFit athletes' participation was gained through this study. However, having additional comprehension of potential contributing variables, how they can impact performance, and how this understanding can contribute to increased athletic performance in CrossFit athletes could increase participation and appreciation of the sport itself.

## 7. Conclusion

Within the parameters of this study, it appears that recreational CrossFit participants find motivation within themselves to participate in CrossFit training-style exercise sessions. More specifically, CrossFit athletes are more likely to participate in this sport for personal fulfillment, growth, and challenge rather than for recognition, social approval, or praise.

**Conflict of Interest Statement**

The authors declare no conflicts of interest.

**About the Author(s)**

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**Mark DeBeliso, PhD FACSM** is a Professor Emeritus at Southern Utah University. His research interests include: orthopaedic biomechanics, mechanics and metabolics of sport movements and work tasks, strength training for all walks of life, and masters athletes.

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