Fitness Content on Social Media and Exercise Behaviors and Motivation in College Students

Thesis

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Shelby Rowles, B.S. Ed.

Health and Rehabilitation Science

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Thesis Committee

Dr. Kristen Welker, Advisor

Dr. Jill Clutter

Dr. Georgianna Sergakis

Abstract

Social media's presence has increased in the lives of college students in the generations following its creation roughly two decades ago. It is important for us to examine its effects on our behaviors and motivations for activity participation, especially those that alter our health. Fitness content, or "fitspiration", is a popular subcategory of social media that is of particular interest, due to its large followings across various social media platforms, as well as its proposed effects on various health-related behaviors.

A sample of nearly 370 Health Sciences students a large, Midwestern university completed a printed survey regarding their interaction with fitness content on social media, exercise behaviors (frequency, length, rating of perceived exertion (RPE), interest in fitness), and motivation towards exercise. Participants were categorized and analyzed according to their interaction with fitness content on social media. Significant differences in exercise frequency were found between those that only view fitness content and those that post and view fitness content, as well as between those that have no interaction with fitness content and those that post and view fitness content. There were also significant differences in length of exercise sessions between those that have no interaction with fitness content and those that view fitness content, as well as those that only view fitness content and those that post and view fitness content. Moreover, there were significant differences in interest in fitness across those that have no interaction with fitness content and those that only view it, those that have no interaction and those that post and only view it, and those that only view it compared to those that post and view it. There were no significant differences found in motivation towards exercise across groups.

This study depicts the significant impact that passive interaction with fitness content on social media has on behaviors and emphasizes the importance of being conscious of what one views on social media networking sites. Moreover, college students in this study are more extrinsically motivated than intrinsically motivated to exercise. This trend towards extrinsic motivation toward exercise is not a cause for concern in itself but may lead to effects that are less desirable compared to if this group were intrinsically motivated for exercise, such as lower levels of exercise adherence. As social media continues to play a monumental role in the lives of college students today, it is essential for us to consider its impacts on health and well-being related behaviors, as social media's presence is expected to increase in the lives of generations to come.

Vita

May 2016 …… Shippensburg Area Senior High School

August 2020 …… B.S.Ed. Exercise Science, Bowling Green State University

August 2020 to present ……..……. Master's Student, School of Health and Rehabilitation Sciences, The Ohio State University

Fields of Study

Major Field: Health and Rehabilitation Sciences

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Chapter 1. Introduction

Physical inactivity and obesity are health concerns of epidemic proportions in the United States. As of 2018, only 23.2 percent of people ages 18 and over met both physical activity guidelines for cardiovascular and muscle-strengthening activity (Centers for Disease Control and Prevention, 2021). The guidelines for cardiovascular fitness include 150 minutes per week of moderate-intensity aerobic physical activity or 75 minutes per week of vigorous-intensity aerobic physical activity, or a combination of the two. Guidelines for muscle strengthening activity include activities of moderate or high intensity, incorporating all major muscle groups for two or more days per week, as well (Centers for Disease Control and Prevention, 2021). Sport and exercise participation in U.S. adult males is only 20.7 percent, and 18 percent in females (Statista, 2021f). The average U.S. adult spends only thirty minutes exercising per day but spends over two hours on social media per day (Statista, 2021d).

Social media has assimilated into our everyday lives and routines over the past twenty years, as the first social media site of the 21st century, "Friendster" was launched in 2002 (Antevenio, 2018). As of February 2019, 90 percent of adults aged 18-29 in the U.S. use social media (Statista, 2021g). There are a variety of social media platforms to join and people often use more than one social media site. In 2018, the average internet user had approximately 8.5 social media accounts (Statista, 2021b). The most popular social media site is Facebook, with over 2.6 billion active users (Statista, 2021e). Other highly used social media platforms include YouTube (approximately 2.29 billion users), Instagram (1.22 billion users), TikTok (689 million users), and Snapchat (498 million users; Statista, 2021e). YouTube, Instagram, and Facebook are the most used platforms for users aged 15-25 years old (Statista, 2021c). Most people are active

users of their social media accounts, as the average U.S. social media user spends several hours on social media each day (Statista, 2021d).

Personal reasons for social media usage vary; however, common trends include to maintain relationships, to create relationships, and for self-expression (Goh et al., 2009). Social media platforms allow for sharing of information and ideas, communication with others (either those one may know in their real lives, or not), and entertainment. According to a 2013 survey, users on social media sites most commonly post pictures, share their opinions, and update their status to share what or how they are doing (Ipsos Global, 2013). As social media has become interconnected with our daily lives, many people rely on it to get information regarding their health and wellbeing. In a study by Thackeray et al. (2013), nearly 32 percent of adults reported using social networking sites for health and 15 percent posted health-related information, comments, or questions. More recently, the use of social media for gathering health-related information is at a record high, especially with the COVID-19 pandemic that emerged worldwide at the beginning of 2020. In a survey by Neeley et al. (2021), approximately 76 percent of adults in the United States used social media networking sites to gain pandemic-related information.

Chapter 2. Review of Literature

Social media enables its users to collect and share health and wellness information. A popular subcategory of health and wellness information on social media that is of particular interest to its users is content about fitness and exercising. Fitness content, also referred to as fitspiration or "fitspo" (i.e. fitness inspiration) includes quotes to inspire physical activity, photos and videos of individual exercises and complete workouts, transformation photos that typically display a major body re-composition (e.g. vast weight loss or muscle gain), sharing workout plans, and selfies taken before/during/after working out, and more. Many account types on social media post fitness content, such as professional athletes, personal trainers, health and fitness businesses and organizations, as well as "everyday" people. Fitness content on social media is popular, as in 2020 the top twenty most-followed fitness content creators on Instagram had a combined following of over 568 million users (Statista, 2021a). As of June 2021, the most followed fitness account on Instagram belongs to well-known athlete/actor Dwayne Johnson (Statista, 2021a). His account has 244 million followers and his most recently posted fitness-related video has over 4.9 million views.

While there are many reasons people seek out fitness content on social media, a common purpose for consumption of fitness content is for inspiration. This trend is supported in research by Raggatt et al. (2018), as their findings suggest fitness content is most commonly consumed as a means to gain inspiration to exercise in order to improve health or wellbeing, as well as to eat healthy food. These findings were echoed in research by Prichard et al. (2020), as women consuming fitspiration content reported significantly greater inspiration to be fit compared to women that consumed social media content about traveling. Moreover, young adults have

reported that fitness content on social media can be considered inspirational in certain contexts, such as seeing a post about a difficult weight loss journey (Vaterlaus et al., 2015).

Many of those consuming fitness content on social media do so to belong to a like-minded online community and for social support. For these people, there is a sense of accountability with others that consume the content as well as the content creator themselves in their journey to achieve their health and fitness goals (Raggatt et al., 2018). Additionally, some people that consume fitness content on social media see other members in their online community to be a source of friendly competition. In a study examining college students, being able to see activity levels of others and being aware that others are exercising by means of social media use caused participants to feel a sense of responsibility to exercise as well (Barnes et al., 2016). These participants reported benefits of feeling encouraged and accepted by their online community, which increased their adherence to exercise as well.

Reasons for accessing fitness content and fitspiration on social media may not be as simple as wanting to be inspired solely to be healthier, however. Many that view fitness content do so in order to inspire them to exercise for appearance related purposes, such as to lose weight, gain muscle, or change the way their body looks (Raggatt et al., 2018). It is common for consumers of fitness content on social media to be exposed to very lean, muscular bodies (Tiggemann & Zaccardo, 2018). In a content analysis of 600 images on Instagram, in photos of women, 75 percent were thin and 56 percent visibly muscular. Moreover, from this same analysis, 60 percent of photos of men displayed men that were highly muscular. This trend is also depicted in Raggatt et al.'s (2018) study, in which participants described fitspiration images as "portraying an ideal representation of health and fitness they wanted to strive for" (Raggatt et

al., 2018, p. 6), as participants reported they used these images to make personal comparisons. Making upward comparisons of one's own physique to those they see on their social media sites can lead to a negative body image (Tiggeman & Zaccardo, 2018). Moreover, fitness content consumers on social media may be motivated to exercise for appearance-related reasons due to feelings of being unsatisfied with their body. This is cause for concern, as appearance-related exercise has been found to be related to obsessive exercise behaviors that can be harmful to the person's health (Lamarche & Gammage, 2012). Additionally, not only can the overrepresentation of the ideal body image that is present in fitness content on social media be associated with a more negative body image, but it also has been found to be correlated to disordered eating (Tiggemann & Zaccardo, 2018). This is echoed by Prichard et al. (2020), as their participants that regularly viewed fitspiration images had significantly greater body dissatisfaction and a more negative mood than participants in the control group (Prichard et al., 2020).

Just as it is important to investigate the effects of consumption of fitness content on social media, we must also consider the effects of posting on social media. Some reasons people post on social media include: to benefit their friends/family by sharing things they believe will interest them, to feel social acceptance, to boost self-esteem by sharing content centered on themselves, and to share successes for self-actualization (King University Online, 2019).

One commonly reported reason for posting fitness content is to use social media as a means of staying accountable to an audience (Leggatt-Cook & Chamberlain, 2011; Teodoro & Naaman, 2013). In a study examining those that post fitness content on social media, participants felt a responsibility to accomplish things offline in order to be able to share their progress with

their online community, and even reported feelings of embarrassment if they informed others in their online network that they missed their goals (Teodoro & Naaman, 2013). Moreover, social media platforms allow for the creation of communities with others with similar goals and interests, which has been shown to provide a sense of unity in achieving goals, such as weight loss (Leggatt-Cook & Chamberlain, 2011). Others report posting fitness content on social media to keep others in their online community up-to-date with their progress, as well as get feedback and tips from others (Pinkerton et al., 2017). Another common motive for posting fitness content on social media is to get recognition. Posters have reported that improvements in fitness (i.e., gains) that were recognized by others helped to increase their motivation to continue being active (Barnes et al., 2016).

Lastly, posting fitness content on social media is related to, or even mediated by, one's desired personal image online. Teodoro & Naaman (2013) found that those that post fitness content on Twitter to their "fit community" would be mindful of the behavioral norms (e.g., content of shared interest) of the group when posting, in order to maintain their identity and to fit with the group. Through observing what others within the group have posted, new members would learn the makeup of their audience and give them insight regarding "acceptable" posting practices. Additionally, online health communities (OHCs) are a specific subdivision of social media in which people with similar conditions and goals can interact with others. For some members of OHCs, they only share their health/fitness related content to fellow members of OHC (such as their diet and activity levels) rather than on other, more inclusive social media environments, like Facebook, in efforts of impression management (Newman et al., 2011).

Social media is the easiest medium to establish and grow one's personal identity, reputation, and online persona (Petruca, 2016). All users of social media are able to create an online persona, or a personal brand, that is representative of how they want to be interpreted by others. If a person wants to be perceived as healthy and active, they may post a selfie after completing a workout, share their plans of competing in a race, or post a quote about the importance of exercise.

Similar to viewing fitness content on social media, posting fitness content on social media has effects on mental wellbeing. People that post certain kinds of fitness content, such as mastery experiences (i.e., displaying the ability to perform a behavior successfully), have reported increases in mental well-being, through the improvement of self-efficacy (Kashian & Liu, 2020). Posting fitness content, specifically selfies, on social media may offer a means of increasing self-esteem (Pounders et al., 2016).

It is possible that some may be inspired by others that post fitness content on social media with large followings in efforts of gaining the same perceived recognition and validation. As related to personal branding, one may want to begin posting their own fitness content on social media in order to get recognition like those with successful accounts. In fact, the need for popularity has been found to play a key role in the use of social networking sites (Utz et al., 2012). On social media sites, receiving "likes," follows, or friend requests are often measures used to represent popularity, which have been found to activate reward systems in the brain (Meshi et al., 2015).

Posting on social media, however, has many possible negative effects. Specifically, people posting on social media may not get the validation they are seeking, and others may be

outspoken in their opinions and feedback. More severely, cyberbullying (i.e., sending negative, hostile messages meant to harm others) has been made easier by the ability to remain anonymous online (Zeitel-Bank & Ute, 2014). Additionally, social media can impact one's ability to think for themselves and hold independent beliefs, as personal opinions are highly influenced by others on social media (Zhu et al., 2014). Social media has been found to cause anxiety and restlessness when one is unable to check their social media applications (Rosen et al., 2013). Moreover, the most active young adult social media users are at higher risk of developing mental health issues in comparison to their peers (Strickland, 2014). Surprisingly, in a study by Skues, Williams, & Wise (2012), the more Facebook friends a person had, the higher levels of loneliness they reported.

Few studies have been published examining exercise behaviors in those posting fitness content to social media. In one such study, DeVitis et al. (2020) found there was a greater increase in physical activity levels in those posting fitness content on social media compared to those not posting. One possibility researchers propose for this difference is by creating fitness content on social media platforms, it may make one more aware of their physical activity levels. However, this is just a hypothesis and there are many potential factors that can influence this significant difference in physical activity levels.

When examining exercise behaviors and behavior change, Self-Determination Theory (SDT) has been used to identify motivations for behaviors and regulatory processes of behavior (Deci & Ryan, 1985). Within SDT, motivation ranges from amotivation to intrinsic motivation. At one end of the SDT spectrum is amotivation, in which a person lacks intention to act, which can be due to not seeing the value of completing the task at hand. This can result in a lack of

action, or completion of a behavior solely by going through the motions (Ryan & Deci, 2000b). On the other end of the SDT spectrum is intrinsic motivation, in which a person engages in an activity for enjoyment and satisfaction of completion of the activity. For behaviors that are intrinsically motivating for a person, outside reinforcements have little effect on behavior.

Between amotivation and intrinsic motivation on the SDT spectrum lies extrinsic motivation, which refers to completion of an activity to gain an independent outcome outside of the activity itself (Ryan & Deci, 2000b). Subdivisions of extrinsic motivation vary by the extent regulation of behavior is autonomous (Ryan & Deci, 2000b) and include external regulation, introjected regulation, identified regulation, and integrated regulation. Autonomy in SDT is measured by perceived locus of causality, how one perceives their actions to be a result of internal or external reasons (Turban et al., 2007).

The external regulation subdivision of extrinsic motivation is the closest of all subdivisions to amotivation on the SDT spectrum. In external motivation, behaviors are performed in order to gain external rewards or avoid punishment. Introjected regulation is the second subdivision of extrinsic motivation and is marked by performance of a behavior which is mediated by internal pressures, such as ego enhancement or shame (Ryan & Deci, 2000a). The third subdivision of extrinsic motivation is identified regulation and is marked by the individual valuing the regulators or goal of a behavior (Ryan & Deci, 2000b). The final subdivision of extrinsic motivation is integrated regulation and is the most internally regulated category in the extrinsic motivation range of the SDT spectrum. In integrated regulation, the individual internalizes reasons for action and assimilates them into self but is still externally motivated for value that is identified outside of performance of the behavior itself (Ryan Deci, 2000a).

As physical activity levels are highly related to health and well-being, it is important to identify a person's motivational profile toward exercise. In order for maintenance of health behaviors, individuals must internalize the value of completing tasks that enhance their health (Ryan et al., 2008). Previous research has identified that extrinsic motivators relating to exercise, such as social media activity on exercise, do not significantly influence exercise maintenance (Zhou & Krishnan, 2019). Moreover, identification of a relationship between activity involving fitness-related content on social media and one's motivational profile (i.e., intrinsically or extrinsically motivated) may give insight to adherence of exercise in the long term, as intrinsic motivation has been found to be a predictor for exercise maintenance in various studies (Ingledew et al., 1998; Oman & McAuley, 1993; Ryan et al., 1997).

While few studies have measured and compared exercise behaviors across groups that differ in their online behaviors (e.g., DeVitis et al., 2020), currently there is no existing research that examines these behaviors across naturally-occurring groups of individuals. For the most accurate assessment, groups should be examined and defined according to behaviors prior to research, rather than changing their behaviors based on group placement. The purpose of this research is to identify exercise behaviors and motivational profiles for exercise across groups according to fitness content-related social media activity in college students, and determine if any significant differences exist across these groups. College students are of particular interest when examining social media behaviors, as the typical college student of today is from the first generation that grew up with social media (Seymour, 2019). Specifically, this study will examine the following research questions:

Do exercise behaviors differ across groups (i.e. post only, view only, both, neither) according to interaction with fitness-related content on social media?

Do motivation profiles for exercising differ across groups according to interaction with fitness-related content on social media?

It is hypothesized that those with the most interaction with fitness content on social media (i.e., posting and viewing) will have greater exercise behaviors (i.e., exercise length and frequency) than those that only consume fitness content, those that only post fitness content, and those that neither view nor post. It is expected that those that are the most active, or post fitness content most frequently, will exercise at higher levels than those that are not, in order to maintain their online persona, stay in touch with their online community (e.g. Pinkerton et al., 2017), and adhere to norms of their community (e.g. Teodoro & Naaman, 2013).

It also is hypothesized that those posting fitness content on social media are more likely to be extrinsically motivated to exercise, in comparison to those that only view it, and those that neither view nor post. It is expected to see these results due to the factors that may influence one to post fitness content on social media that are external to exercise, such as to stay accountable to an online community (e.g. Leggat-Cook & Chamberlain, 2011; Teodoro & Naaman, 2013) and get feedback/recognition (e.g. Barnes et al., 2016).

Chapter 3. Methods

Participants

A convenience sample of college students was used in this study. Students attended a large Midwestern university in the Health Sciences major program of study. All participants were at least 18 years old and enrolled in at least one Health Sciences course at the time of data collection. Participant recruitment was completed by emailing professors that taught two introductory courses within the Health Sciences department (see Appendix A). Approximately 480 students were recruited for this study.

Measure

A paper survey was developed specifically for this study, included in Appendix B. The survey was two pages front and back with an informed consent cover sheet. In total, the survey included 45 items across four subsections. Subsections of questions in the survey included exercise behaviors, motivation toward exercise, social media behaviors, and demographics.

Exercise Behaviors

Participants were asked to identify their exercise behaviors. Participants identified if they are currently exercising regularly (defined in the survey as at least 30 minutes of exercise 3 days per week, for the last 3 months; response options: yes/no), how long they have been exercising regularly (response options: under 3 months, 3-6 months, 6-9 months, 9-12 months, over 1 year, not applicable - I do not currently exercise regularly), how many days per week they exercise (response options: 0-7 days), and how long their average workout lasts in minutes (written response).

Participants were asked to identify each of the areas of fitness they work on in a typical workout (response options: cardiorespiratory endurance, muscular strength, muscular endurance,

flexibility, skill-related, I do not currently exercise), identity the frequency of each area of fitness they work on while exercising (response options: every workout, most workouts, some workouts, rarely, not applicable), and the average length of their workouts in minutes (written response). Additionally, participants were asked to note their typical rating of perceived exertion (RPE) for their workouts using the Borg (1998) scale, which ranges from six to twenty (response options: 0: not applicable, 6: no exertion; sitting and resting, 7, 8, 9: very light, 10, 11: light, 12, 13: somewhat hard, 14, 15: hard, 16, 17: very hard, 18, 19: extremely hard, 20: maximal exertion). The Borg scale has been found to be a reliable and valid measurement tool for RPE across various populations, including healthy adults, in a meta-analysis with validity coefficients ranging between .57 and .72 for a variety of physiological criterion (Chen, Fan, & Moe, 2002).

Motivation Towards Exercise

In order to measure motivation towards exercise, the third edition of the Behavioral Regulation in Exercise Questionnaire (BREQ-3; Markland and Tobin 2004; Wilson et al., 2006b) was used. The original BREQ scale was developed in by Mullan, Markland, and Ingledew (1997), which has been continuously improved and developed over the past two decades. This scale has been found reliable in previous studies (Cronbach $\alpha \geq .70$; Wilson et al., 2006a, Mullan et al., 1997). This 24-statement scale is used to categorize an individual's motivation toward exercise, based on the Self-Determination Theory. Moreover, the BREQ-3 uses a five-point likert scale to measure the magnitude a person identifies with each statement, with response options of 0 - Not true for me, 1, 2 - Sometimes true for me, 3, and 4 - Very true for me. Categorizations for motivation towards exercise include amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic regulation, each

with four corresponding statements. Scores for each category were calculated by totaling the four statements within the subscale. The total score for each category ranged from zero to sixteen. Example statements from each category include:

Amotivation: “I don’t see why I should exercise.”

External regulation: “I exercise because other people say I should.”

Introjected regulation: “I feel guilty when I don’t exercise.”

Identified regulation: “It’s important for me to exercise regularly.”

Integrated regulation: “I exercise because it is consistent with my life goals.”

Intrinsic regulation: “I exercise because it’s fun.”

Social Media Behaviors

Participants were asked to note if they currently use social media (response options: yes/no), what social media platforms they regularly use (response options: Facebook, Instagram, Twitter, Snapchat, TikTok, YouTube, LinkedIn, Pinterest, Other (written response), I do not use social media regularly), and how long they spend on social media in a typical day across all platforms. Additionally, participants were asked to identify if they see fitness content on their social media account(s) (response options: yes/no), and if they actively seek out fitness content on their social media account(s) (response options: Yes: I actively seek out fitness content, No: but I see it unintentionally, I both seek out this content and see it unintentionally, I do not seek fitness content on my social media). Participants identified if they have posted fitness content on their social media account(s) in the past (response options: yes/no), if they currently post fitness content on their social media account(s) at time of survey completion (response options: yes/no), and how often they post in a week across platforms if they are currently posting (response

options: 0-2 times per week, 3-7 times per week, 8-15 times per week, 16-30 times per week, 31-45 times per week, over 45 times per week).

Demographics

Participants were asked seven questions in order to gain insight on some foundational information about those that completed the survey. Participants noted their age (written response) and gender (response options: male, female, transgender, non-binary, other, prefer not to answer). Additionally, students identified what year of schooling they are in (response choices: 1st year, 2nd year, 3rd year, 4th year, 5th year, 5+ years, grad student), their major, and the university they attend. Students were asked to note on a scale from 0-10 how interested they are in health and fitness, as well as if they have any experience in the fitness industry (e.g., certification, coaching, work experience).

Procedures

This study was approved by the Institutional Review Board (IRB) with a category 2 exemption. The survey was distributed in person, over a period of three weeks. The survey took approximately ten minutes to complete. Two professors approved survey distribution during their class time. Surveys were distributed to in two introductory Health Sciences courses. The informed consent document was on the first page (cover sheet) of the paper survey. The document listed the subject's rights, purpose of the study, duration of the study, confidentiality maintenance, use of data in future research, and contact information. No signature was required by participants, rather, completion of survey indicated consent. Completed surveys were kept in a locked drawer, in a locked office.

Analysis

Data entry and analysis was completed using IBM SPSS 27 (IBM SPSS Statistics, Version 27.0) on an encrypted, password protected laptop. Exercise behaviors and motivation toward exercise was analyzed across the following groups: 1) participants that do not post or view fitness content on social media 2) participants that do not post but view content on social media 3) participants that both post and view fitness content on social media. There were not enough participants who post but do not view fitness content to be included for analysis. Exercise frequency, exercise session length, rating of perceived exertion (RPE), and interest level in fitness were variables analyzed with regards to exercise behaviors across the previously mentioned groups. Motivation toward exercise, using a modified score from the BREQ-3, was used to analyze motivation type across groups.

Chapter 4. Results

Participants

A total of 368 surveys were completed. There were 68 participants that were removed from the study as they did not meet inclusion criteria (n = 2) or did not fully complete the survey (n = 66). In total, there were 299 participants included in the sample. All participants attended a large Midwestern university and were Health Sciences students. The majority of participants were female (n = 233, 77.9 percent). Additionally, the average participant age was 18.96 years old (SD = 1.45), with the youngest participant being 18 years old at time of participation and the oldest 29 years old. The majority of the sample was in their first year of college (n = 197; 66.1 percent). Additional information regarding demographics of the sample is listed below in Table 1.

Table 1. Demographics

	n (%)
Gender	
Female	233 (77.9)
Male	64 (21.5)
Other	1 (0.3)
Year in College	
First Year	197 (66.1)
Second Year	16 (5.4)
Third Year	75 (25.2)
Fourth Year	7 (2.3)
Fifth Year	1 (0.3)
Over Five Years	2 (0.7)

Exercise Behaviors

Approximately 16.1 percent (n = 48) of participants identified they did not currently exercise regularly, as previously defined. The largest proportion of participants identified exercising regularly for over one year, at 40.5 percent (n = 120). Out of 299 participants, a total

of 248 identified themselves as regular exercisers (82.9 percent). Additional information regarding length participating in regular exercise is listed below in Table 2.

The largest proportion of participants reported exercising three days per week (n = 70), with 23.5 percent of participants reporting this level of exercise frequency. The average days per week spent exercising was 3.23 days (SD = 1.85). Additional information regarding exercise frequency is listed below in Table 2. Regarding exercise session length, the largest proportion of the sample reported exercising between 30 and 60 minutes, with 57.3 percent (n = 145) reporting this exercise length. The average exercise session length from was 53.47 minutes (SD = 32.22). Additional information regarding exercise session length is listed below in Table 2.

Participants identified the areas of fitness they engaged in when exercising. Of participants that identified being regular exercisers, a majority of participants reported engaging in cardiorespiratory endurance activities, muscular strengthening, and muscular endurance activities. Additional information regarding areas of fitness participants engaged in is listed below in Table 2. Regarding interest in fitness, 82.9 percent of the sample (n = 247) noted their interest in fitness over five on the scale. The average interest in fitness on a scale from one to ten in the sample was 7.49 (SD = 1.99).

Participants rated their level of perceived exertion (RPE) during their usual exercise sessions on the Borg Scale, which ranges from 6-20. No participants rated their RPE at six, seven, nor eight. Approximately 1.2 percent of the sample (n = 3) noted their RPE at levels nine and ten, with nine described as “very light.” 20 participants (8.0 percent) identified their usual workouts as being at levels eleven and twelve on the scale, with eleven described as “light.” The largest proportion of participants ranked their RPE on the Borg scale at levels thirteen and fourteen, with 46.8 percent (n = 117) of the sample within this range, with thirteen described as

"somewhat hard." The second largest proportion of participants rated their RPE at fifteen and sixteen, with 34.4 percent (n = 86) in this range, with fifteen described as "hard." 8.4 percent of participants (n = 21) noted their usual workouts as being at levels seventeen and eighteen on the Borg scale, with seventeen described as "very hard." Two participants noted their RPE at nineteen (0.8 percent), which is described as "extremely hard." Only one participant ranked their RPE at twenty (0.4 percent), which is described as "maximal exertion" on the scale. The average RPE for exercise sessions of the sample was approximately 14.27 (SD = 1.71), which corresponds with "somewhat hard" on the scale.

Table 2. Exercise Behaviors

	n (%)
Regular Exercisers	248 (82.9)
Length of Regular PA	
Under 3 months	65 (22.0)
3 – 6 months	41 (13.9)
6 – 9 months	14 (4.7)
9 – 12 months	8 (2.7)
Over 1 year	120 (40.5)
Areas of Fitness	
Cardiorespiratory Endurance	232 (81.7)
Muscular Strengthening	146 (51.4)
Muscular Endurance	159 (56.0)
Skill-Related	64 (22.5)
Flexibility	121 (42.6)
Exercise Frequency	
1 day	10 (3.4)
2 days	39 (13.1)
3 days	70 (23.5)
4 days	58 (19.5)
5 days	48 (16.1)
6 days	24 (8.1)
7 days	7 (2.3)
Length of Exercise Session	
30 minutes or less	41 (16.2)
Over 30 to 60 minutes	145 (57.3)
Over 60 to 90 minutes	48 (18.9)
Over 90 minutes	19 (7.5)

Social Media Behaviors

All participants in the analysis were regular users of social media, defined as logging in at least once per week. The majority of the sample reported using Instagram, Snapchat, Twitter, TikTok, and YouTube regularly. Additional information regarding social media platforms used regularly by the sample is listed below in Table 3.

Time spent on social media in an average day was investigated. Approximately 1.5 percent (n = 4) of the sample noted spending less than an hour on social media each day. The largest proportion of the sample spent between one to two hours on social media per day, with 33.5 percent of the sample (n = 90), selecting this option. 27.5 percent of participants (n = 74) spent over two hours to three hours on social media per day, 12.7 percent (n = 34) spent over three hours to four hours per day, 10.4 percent (n = 28) spent over four hours to five hours per day. Moreover, 7.9 percent of the sample spent (n = 21) over five hours to six hours on social media per day, 1.5 percent (n = 4) spent over six to seven hours on social media per day, and 3 percent (n = 8) spent over seven to eight hours. Five participants spent over eight hours per day on social media (2.7 percent). The average time spent on social media per day was 204.83 minutes (SD = 119.2), roughly three hours and twenty-four minutes.

94.6 percent of the sample (n = 283) noted seeing fitness content on their social media accounts. Of these participants, 58.5 percent (n = 175) noted they actively seek out this content, while 36.1 percent (n = 108) do not seek this content, but still see it on social media. Approximately 36.8 percent of the sample (n = 110) identified as having posted fitness content to social media, either actively at the time of survey completion (n = 28) or in the past (n = 82). Of the group that currently posts, 71.4 percent (n = 20) noted they have posted fitness content up to

twice per week, 21.4 percent (n = 6) have posted fitness content between three to seven times per week, and 7.1 percent (n = 2) have posted between eight to fifteen times per week.

Interaction with fitness content was analyzed across viewing and posting behaviors. Approximately 5.0 percent of the sample (n = 15) neither viewed nor posted fitness content on social media, 1.0 percent (n = 3) did not view fitness content but have posted fitness content. The largest proportion of the sample did not post fitness content, but have viewed it, at 67.6 percent of the sample (n = 202). 26.4 percent of the sample (n = 79) have both posted and viewed fitness content on their social media.

Table 3. Social Media Platforms

	n (%)
Social Media Platforms	
Facebook	99 (33.1)
Instagram	277 (92.6)
Snapchat	278 (93.0)
Twitter	127 (42.5)
TikTok	235 (78.6)
YouTube	175 (58.5)
LinkedIn	26 (8.7)
Pinterest	60 (20.1)
Other	9 (3.01)

Motivation Type

The BREQ-3 is scored by calculating the sum of participant responses with questions that correspond with each of the six subdivisions of motivation. Due to tied scores across various subdivisions of motivation type, a simplified motivation score was calculated, with amotivation, intrinsic motivation, and extrinsic motivation categories. 1.6 percent of the sample (n = 4) were classified within the amotivation category. 24.1 percent of the sample (n = 62) were grouped

within the intrinsic motivation category, and 74.3 percent of the sample (n = 257) were grouped within the extrinsic motivation category.

Research Question 1: Do exercise behaviors differ across groups, according to interaction with fitness-related content on social media?

In order answer the first research question, a series of one-way ANOVAs were used to measure differences in exercise behavior variables in the following groups: 1) participants that do not post or view fitness content on social media 2) participants that do not post but view content on social media 3) participants that both post and view fitness content on social media. Participants that post but did not view fitness content were excluded from the analysis, due to the very small amount of subjects falling in this category (n = 3). The following exercise behavior variables were analyzed: frequency of exercise, length of exercise session, RPE for exercise session, and interest level in fitness across were analyzed across three groups. Mean scores for each group can be found in Table 4. A one-way ANOVA was used and Tukey's post hoc comparisons examined differences between groups.

Table 4. Interaction Groups Exercise Behaviors

Exercise Behaviors	Neither post nor view fitness content			View fitness content only			Post and view fitness content		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Frequency	15	2.13	2.48	201	3.19	1.83	79	3.59	1.65
Length	15	30.67	37.65	199	53.56	30.32	78	58.14	31.83
RPE	7	13.29	3.20	172	14.19	1.73	70	14.56	1.42
Interest	15	5.47	2.77	202	7.44	1.85	78	8.13	1.80

There were significant differences between groups for participant frequency of exercise per week, (F (2, 292) = 4.34, p = 0.14. Participants that both posted and viewed fitness content on social media exercise more frequently (M = 3.59, SD = 1.65, n = 79) than those that neither

posted nor viewed fitness content (M = 2.13, SD = 2.48, n = 15, p = 0.13). Those that posted and viewed fitness content exercised more frequently than those that only viewed it (M = 3.19, SD = 1.83, n = 201, p = .013). There was no significant difference in exercise frequency between participants that neither posted nor viewed fitness content and those that only viewed fitness content.

There were significant differences between groups for length of exercise sessions, (F (2, 281) = 4.81, p = .009). Participants that neither posted nor viewed fitness content on social media exercised significantly at shorter lengths (M = 30.67, SD = 37.69, n = 15) compared to participants that viewed but did not post fitness content on social media (M = 53.56, SD = 30.32, n = 191, p = .019), as well as participants that both posted and viewed fitness content on social media (M = 58.14, SD = 32.76, n = 78, p = .006). Participants that viewed but did not post fitness content on social media did not significantly differ in length of exercise session compared to participants that viewed and posted fitness content (p = .524).

There were no significant differences between groups for RPE of exercise sessions across any groups (F (2, 246) = 2.35, p = .098).

Interaction with fitness content on social media affected participant interest in fitness (F (2, 292) = 13.01, p < .001). Participants that neither posted nor viewed fitness content on social media (M = 5.47, SD = 2.78, n = 15) had significantly less interest in fitness than participants that viewed but did not post fitness content on social media (M = 7.44, SD = 1.85, n = 202, p < .001), as well as participants that both posted and viewed fitness content on social media (M = 8.13, SD = 1.80, n = 78, p < .001). Participants that did not post fitness content but viewed it had significantly lower interest in fitness (M = 7.44, SD = 1.85, n = 202), compared to those that both viewed and posted (M = 8.13, SD = 1.80, n = 78, p = .019).

Research Question #2: Do motivation profiles for exercising differ across groups according to interaction with fitness-related content on social media?

A summary of student motivation by group is reported in Table 5. A simplified motivation score was analyzed across groups using a two-by-two chi-square test. Participants that post but did not view fitness content were excluded from the analysis, due to the very small amount of subjects falling in this category ($n = 2$). Additionally, participants that view but do not post were not included in the analysis, due to the small amount of participants being distributed across motivation types ($n < 5$). Participants in the amotivation category of the simplified motivation score were also excluded from the analysis, due to the small size of this portion of the sample, across fitness content interaction-based groups. Of the students who view fitness content but do not post, 76 percent of students were extrinsically motivated for exercise and 24 percent were intrinsically motivated. Of the students who both view and post fitness content, 74.3 percent of students were extrinsically motivated and 25.7 percent were intrinsically motivated. Results of the 2x2 chi-square analysis indicate that groups did not significantly differ from one another $\chi^2 (5, N = 253) = .081, p = .776$.

Table 5**.** Motivation Toward Exercise by Interaction with Fitness Content

	Simplified Motivation Score	
Group	Intrinsic	Extrinsic
	n (%)	*n (%)*
Neither post nor view	2 (3.2)	8 (4.2)
View only	41 (66.1)	130 (68.1)
Post only	1 (1.6)	1 (0.5)
Post and view	18 (29.0)	52 (27.2)
Total	62 (100)	191 (100)

Chapter 5. Discussion

This study aimed to measure differences in exercise behaviors and motivation towards exercise according to different interaction types with fitness content on social media. Overall, interaction with fitness content influences some exercise behaviors. Specifically, viewing fitness content on social media has a significant impact on frequency and length of exercise sessions, as well as interest level in fitness. Significant differences in these behaviors were found within those that are interacting with fitness content on any level (i.e. posting, viewing, or both), which depicts the influence fitness content on social media has on our health-related behaviors, as portrayed in previous studies (DeVitis et al., 2020).

Previous literature has emphasized that even passive interaction fitness content impacts exercise behaviors (Raggat et al., 2018; Barnes et al., 2016), as this study echoes, with viewing fitness content significantly impacting exercise length and frequency. Passive consumers of fitness content may not be aware of how much, or if at all, they are being influenced by solely viewing this type of content on social media. Due to the passive nature of viewing, it is possible this group may feel as if they are not influenced by this content in a way that results in concrete effects on their behavior (i.e., exercise behaviors). However. this study reports just the opposite. This emphasizes the importance of being conscious of what one is viewing on social media networking sites and acknowledging one does not have to contribute to the cause in order to be affected by it.

Moreover, this study aimed to measure differences in motivation toward exercise, based on participant interaction with fitness content. While no significant differences in motivation type were found, the majority of our sample was extrinsically motivated to exercise on the BREQ-3 scale. This has been supported by previous research, as more college students have

been found to be extrinsically motivated than intrinsically motivated (Snyder, et al., 2017). This trend toward extrinsic motivation in college students in exercise specifically may be an extension of the effect social media has on all behaviors of this group. Perhaps college students of today, having used social media for most of their lives, may have been influenced to be extrinsically motivated in general, due to the constant interaction with their peers and consistently being perceived by others. While the idea that college students are an extrinsically motivated-dominant group is not necessarily inherently negative, it may have effects that are not as desirable, when compared to if this group was dominantly intrinsically. Previous research has shown that being intrinsically motivated is more highly related to exercise adherence (Oman & McAuley, 1993; Ingledew et al., 1998, Ryan et al., 1997), which will have greater health benefits for individuals in the long term, as well as a larger effect on efforts of changing U.S. obesity and sedentary levels.

A larger proportion of the sample identified viewing fitness content on social media than anticipated, which was comparable to the prevalence of general social media use of this age group (Statisica, 2021g). This further emphasizes the far-reaching presence fitspiration has on social media networks, which only continues to grow. We must consider the growth of fitness content consumption on social media, as it has been found to be associated with both positive and negative health outcomes, as previously described in this paper (Barnes et al., 2016; Lamarche & Gammage, 2012; Tiggeman & Zaccardo, 2018).

As with all academic research, this study had limitations. This study used convenience sampling, within a population that is intuitively knowledgeable on the effects of physical activity, which may be represented through the sample's levels of physical activity at much higher levels than the general population of this age group. This may have affected the sample's

representativeness to the larger college student population of original interest. Additionally, a disproportionate number of participants in this study were female, which may have influenced results. Due to the ongoing COVID-19 pandemic, a history effect may be present as overall health and well-being has been brought to the forefront of the collective attention of the world. This may have caused changes to health-related behaviors, resulting in some participants exercising less to reduce possible exposure to COVID-19, while others may be exercising at levels higher than their typical amount in efforts to maintain their health.

Future research may aim to shift the focus of fitspiration on its effects of viewers, rather than posters, as this group is not only larger, but has been found to have stronger impacts on exercise behaviors in this study. Additionally, future research may want to examine quantitative thresholds for significant differences in exercise behaviors based on interaction with fitness content, such as time spent consuming fitness content and frequency of posting per week. A qualitative standpoint should be considered in future research as well, with goals to identify different kinds of fitness content that may lead to changes in exercise behaviors. For example, one such future study may want to examine if viewing or posting quotes has a more significant impact on exercise behaviors compared to viewing or posting workout selfies.

An additional area of interest for future research is if interaction with fitness content on social media affect men and women differently. The effects of fitness content on social media for women has been a particular area of interest in research (Prichard et al., 2020), which may be a result of societal beauty expectations, along with of the emphasis of appearance in exercise and social media. Future research may want to address gender-specific experiences and outcomes regarding exercise behaviors and motivation as related to fitness content on social media.

Social media has gone from a convenient way to stay in touch with others to a monumental, if not essential, part of everyday life for college students. It is important for us to consider the effects it has on our behaviors in general, especially those that effect our health and well-being. While this study aimed to do so, researchers should continue to explore the effects of fitness content on social media, as it is expected to continue its presence in the lives of future generations.

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Appendix A: Recruitment Email Template

Hi Dr. (professor name)

I hope you are doing well! I will be starting data collection for my thesis research this fall, examining exercise behaviors and motivation towards exercise in college students that may view fitness-content on social media. I was wondering if you would be willing to allow me to hand out my survey to one of your classes. I could do this either before class starts or after it is completed; the survey should take approximately 10 minutes to complete.

Please let me know if this would be possible!

Thank you,

Shelby Rowles

Appendix B: Survey

The purpose of this study is to learn more about the relationship between social media habits, exercise behaviors, and motivation for exercise. Your participation in this study is voluntary and includes this survey only. It should take approximately 10 minutes to complete this survey. There are no incentives for participation in this study. You may discontinue your participation in this survey at any time without penalty. Your de-identified information may be used or shared with other researchers without your additional informed consent. Confidentiality of data will be maintained by using a password-protected laptop with an encrypted flash drive. The flash drive will be kept in a locked office when not being used. Data entry and analysis will be completed on an encrypted, password protected laptop.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact the Office of Responsible Research Practices at 1-800-678-6251. Contact Shelby Rowles c: (717) 377-4542 e: rowles.28@osu.edu for questions, concerns, or complaints about the study.

Please circle one answer for each of the following questions.

1. Have you participated in structured physical activity at a moderate intensity (with noticeable increases in heart rate and breathing) for at least 30 minutes, at least 3 days per week, for the last 3 months?							Yes	No
2. How long have you participated in structured physical activity at a moderate intensity (with noticeable increases in heart rate and breathing) for at least 30 minutes, for at least 3 days per week?	I do not currently exercise	Under 3 months	3 – 6 months	6 – 9 months		9 – 12 months		Over 1 year
3. In an average week, how many days do you exercise?	0 days	1 days	2 days	3 days	4 days	5 days	6 days	7 days

If you are not currently exercising, you may skip to question 8.

4. In minutes, how long do your workouts typically last? **List one number only, no ranges.**

Write "0" if you do not currently workout. _____

5. In a typical workout, what areas of fitness do you work on? **Select all that apply.**

☐ I do not currently exercise

☐ Muscular Endurance (e.g. lifting light weights for higher repetitions)

☐ Cardiorespiratory Endurance (e.g. walking, jogging, biking)

☐ Flexibility (i.e. stretching)

☐ Muscular Strength (e.g. lifting heavy weights for lower repetitions)

☐ Skill-Related (i.e. agility, power, reaction time)

6. Identify the areas of fitness you work on while exercising in terms of frequency. If you do not work on an area of fitness listed below, **please select "Not applicable".**

	N/A	Rarely	Some workouts	Most workouts	Every workout
Cardiorespiratory Endurance	0	1	2	3	4
Muscular Strength	0	1	2	3	4
Muscular Endurance	0	1	2	3	4
Flexibility	0	1	2	3	4
Skill-Related	0	1	2	3	4

7. Using the table below, what is your rating of perceived exertion (RPE) for a typical workout? (Source: Borg's Perceived exertion and pain scales. Champaign, IL: Human Kinetics, 1998)

Check the corresponding box.
_____ N/A – I do not currently exercise

	Perceived Exertion Rating	**Description of Exertion**
	6	**No exertion. Sitting & resting.**
	7	
	8	
	9	**Very light**
	10	
	11	**Light**
	12	
	13	**Somewhat hard**
	14	
	15	**Hard**
	16	
	17	**Very hard**
	18	
	19	**Extremely hard**
	20	**Maximal exertion**

8. What social media platforms do you currently use regularly? (Logging in at least once a week). **Please check all that apply.**

☐ I do not use social media regularly	☐ Snapchat	☐ YouTube
☐ Facebook	☐ Twitter	☐ LinkedIn
☐ Instagram	☐ TikTok	☐ Pinterest

☐ Other(s) Please list:

9. In a typical day, how long do you spend on social media in total? **Consider all platforms.** Referring to screen time data listed on your smart phone may be helpful in reporting accurate data. **List one number only, no ranges. Write "0" if you do not use social media.**

_____

10. Please answer the following questions about exercise. (Source: Markland and Tobin, 2004; Wilson et al., 2006). **Please circle one number per question.**

	Not true for me		Sometimes true for me		Very true for me
It's important for me to exercise regularly.	0	1	2	3	4
I don't see why I should have to exercise.	0	1	2	3	4
I exercise because it's fun.	0	1	2	3	4
I feel guilty when I don't exercise.	0	1	2	3	4
I exercise because it's consistent with my life goals.	0	1	2	3	4
I exercise because people say I should.	0	1	2	3	4
I value the benefits of exercise.	0	1	2	3	4
I can't see why I should bother exercising.	0	1	2	3	4
I enjoy my exercise sessions.	0	1	2	3	4
I feel ashamed when I miss an exercise session.	0	1	2	3	4
I consider exercise as part of my identity.	0	1	2	3	4
I take part in exercise because my friends/family/partner say I should.	0	1	2	3	4
I think it's important to make the effort to exercise regularly.	0	1	2	3	4
I don't see the point in exercising.	0	1	2	3	4
I find exercise a pleasurable activity.	0	1	2	3	4
I feel like a failure when I haven't exercised in a while.	0	1	2	3	4
I consider exercise a fundamental part of who I am.	0	1	2	3	4
I exercise because others will not be pleased with me if I don't.	0	1	2	3	4
I get restless if I don't exercise regularly.	0	1	2	3	4
I think exercising is a waste of time.	0	1	2	3	4
I get pleasure and satisfaction participating in exercise.	0	1	2	3	4
I would feel bad about myself if I was not making time to exercise.	0	1	2	3	4
I consider exercise to be consistent with my values.	0	1	2	3	4
I feel under pressure from my friends/family to exercise.	0	1	2	3	4

Please circle one answer for each of the following questions.

11. Do you see fitness content on your social media(s)? (E.g. friend posting a selfie at the gym, professional businesses or organizations, personal trainers, professional athletes, etc.)	Yes No

12. If you see fitness content on your social media(s), are you actively seeking out this content? (E.g. following fitness "influencers", looking up different workouts, etc.)			
I do not see fitness content on my social medias	Yes, I actively seek out fitness content	No, but I see it unintentionally (ex. ads, suggested on my page)	I both seek out this content and see it unintentionally

13. Do you currently post fitness content on your social media(s)? This includes: inspirational quotes about physical activity, photos/videos of exercises/working out, transformation photos, selfies taken during/after a workout, workout stats (such as a screenshot of a workout summary with calories burnt, total distance, etc.)	Yes No
14. Have you posted fitness content on your social media(s) in the past?	Yes No

15. If you post fitness content on your social media account(s), how often do you post in a typical week? **Consider all platforms.** Example: If on average, you post twice a day on Snapchat and once a week on Facebook, your average would be 15 times per week.						
I do not post fitness content	0-2 times per week	3-7 times per week	8-15 times per week	16-30 times per week	31-45 times per week	Over 45 times per week

16. How do you identify your gender?	Male	Female	Transgender	Non-Binary	Other	Prefer not to answer
17. What year are you in school?	1st year	2nd year	3rd year	4th year	5th year	5+ year	Graduate Student

18. What is your age in years? _____
19. What is your program/major? No abbreviations please. _____
20. What college/university are you currently attending? _____
21. From 0-10, with 0 being not at all interested and 10 being extremely interested, how interested are you in health and fitness? **Please list one number only, <u>no ranges</u>** ____
22. If you have experience in the fitness industry (such as education/certification, work experience, etc.), briefly describe below. If not, you may skip this question.

_____

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<u>We thank you for your time spent taking this survey.</u>