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Facebook, Relatedness and Exercise Motivation in University Students: A Mixed Methods Investigation

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Highlights:

- FB can influence both controlled and autonomous forms of motivation
- Relatedness mediates the relationship between FB use and exercise motivation
- FB use that leads to feelings of disconnection can have negative effects on exercise

Abstract

Objectives: To examine the relationship between Facebook (FB) use, relatedness and exercise motivation.

Design: Two studies comprised a mixed-methods concurrent design. Study 1 was a cross-sectional quantitative assessment of the relationships between FB use, relatedness and exercise motivation. Study 2 explored qualitative perceptions of how FB influences exercise motivation.

Method: Study 1: 311 undergraduate students completed a survey assessing FB use, exercise motivation and relatedness. Mediation analysis was conducted to examine relationships. Study 2: 19 participants took part in focus groups exploring experiences of exercise-related FB use and its perceived role in motivation.

Results: Study 1: FB use was related to external and introjected regulation. Relatedness mediated the relationships between FB use, introjection, and autonomous forms of motivation. Study 2: Qualitative data suggested FB can either promote (through connection, positive social comparison) or discourage exercise (through disconnection, negative social comparison, health-negating features).

Conclusion: FB use was related to external and introjected regulation. Positive relationships between FB and autonomous forms of motivation were mediated by relatedness, suggesting that interventions should focus on fostering feelings of connection with others. FB use that encourages relatedness with like-minded individuals has potential to promote autonomous motivation for exercise.

Keywords: social media, physical activity, self-determination theory, relatedness

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1. Introduction

Online social networking sites, such as Facebook (FB), are ubiquitous in society and have changed the way people interact. FB provides its 1.28 billion daily users (Facebook, 2017) with a personal profile and the ability to upload photos, access others' profiles, accumulate friends, and interact with these friends through messaging, commenting on photos, status updates, wall posts and other applications. Adults aged 18-25 years encompass 23% of all FB users (Facebook, 2017) and a large proportion (32%) of undergraduate students spend over four hours a day on Facebook (Bicen & Cavus, 2011). Researchers have begun to investigate the potential for these changing interaction patterns to positively (or negatively) affect health behaviours of young adults, such as physical activity (PA).

Regular PA is beneficial for health, physical and psychological wellbeing (Lee, Shiroma, Lobelo, Blair, & Katzmarzyk, 2012). The World Health Organization (2011) recommends that adults participate in 150 minutes of moderate PA per week, yet due to a decline in PA during the ages of 18 and 25 years young adults are not meeting PA guidelines (Kilpatrick, Hebert, & Bartholomew, 2005). One form of PA is exercise, which is planned, structured, and involves pursuit of a physical fitness objective(s) (Caspersen, 1985). Thus, an important focus within health psychology is to understand the factors that influence exercise motivation and behaviour, with recent interest growing in the potential role of social media, and FB in particular (e.g., Cavallo et al., 2014; Ellison, Steinfield, & Lampe, 2007; Mabe, Forney, & Keel, 2014).

One framework to understanding the effects of FB use on exercise motivation is through Self Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000), which examines the different types of motivation underlying exercise behaviour. First, SDT distinguishes between

extrinsic and intrinsic motivation. Extrinsic motivation occurs on a continuum of less self determined (controlled) to more self-determined (autonomous) motivation. Controlled forms of motivation involve exercising due to external pressures such as financial rewards (external regulation), or due to internal pressures such as seeking approval from others or avoiding guilt (introjected regulation). More autonomous forms of extrinsic motivation involve exercising to achieve a positive internal outcome such as improved health (identified regulation), exercising as an activity integral to the self (integrated regulation) or exercising for the inherent enjoyment of the activity (intrinsic motivation). Although some forms of controlled motivation may play a role in initial exercise adoption (Daley & Duda, 2006; Edmunds, Ntoumanis, & Duda, 2006), there is extensive evidence that autonomous motivation is related to sustained exercise participation (Chatzisarantis & Hagger, 2009; Edmunds et al., 2006; Ingledew & Markland, 2008; Teixeira, Carraca, Markland, Silva, & Ryan, 2012).

Much of the research on FB use has focused on adolescents and college-aged individuals, and has found FB use to be associated with negative self-perceptions related to weight and exercise. FB use is associated with increased weight dissatisfaction, internalization of the thin ideal, drive for thinness, and negative body image (Meier & Gray, 2014; Tiggemann & Slater, 2013), which can all lead individuals to increase their exercise behaviour (Anderson & Bulik, 2004; Brudzynski & Ebben, 2010). The motivation underlying these increases in exercise behaviour may however be maladaptive. Individuals who exercise for extrinsic motives (such as poor body image and the drive for thinness) are more likely to be driven by feelings of guilt and shame (i.e., introjected regulation, (Thogersen-Ntoumani & Ntoumanis, 2006) and as a result experience poorer psychological wellbeing. Thus whilst this chain of events suggests FB has potential to increase engagement in exercise, this is likely through controlled forms of motivation and accompanied by negative affect.

A second tenet of SDT indicates that satisfaction of three basic psychological needs facilitates autonomous forms of motivation and positive wellbeing (Deci & Ryan, 2002; Deci & Ryan, 2008). The three basic psychological needs are autonomy (a sense of ownership over one's behaviour), competence (effectively mastering challenging tasks) and relatedness (feeling a meaningful connection with others). It is within the social context that needs can be promoted or thwarted (Deci & Ryan, 1985) suggesting FB, as a growing part of the social context for undergraduate students, has potential to play a positive or negative role in exercise motivation and wellbeing.

Given that FB is used as a tool to establish, maintain or enhance connections with others (Bonds-Raacke & Raacke, 2010; Grieve, Indian, Witteveen, Tolan, & Marrington, 2013) the basic need for relatedness is of interest to the present study. Perceptions of personal connections with others, such as other members of a fitness class, can lead to fulfillment of the need for relatedness (Teixeira et al., 2012). Satisfaction of the need for relatedness occurs through varying methods of social interaction including, face to face, telephone, and online social interactions (Downie, Mageau, & Koestner, 2008). Whilst relatedness plays an important role in fostering autonomous motivation (Ryan & Deci, 2000), changes in relatedness have also been found to predict changes in introjected regulation in exercise settings (Rahman, Thogersen-Ntoumani, Thatcher, & Doust, 2011). Therefore it is possible that relatedness might be a mediator through which FB enhances both controlled and autonomous forms of exercise motivation. It is noteworthy that when controlled motivation (such as introjected regulation) co-exists with more autonomous forms of motivation it may not be detrimental to exercise adherence (Markland & Ingledew, 2007).

Recent research suggests that feelings of social connectedness derived from FB are associated with improved mental health and well-being (Grieve et al., 2013). However whether FB use provides positive or negative consequences may be related to the experience of

connectedness that occurs on FB. Relatedness appears to function as both a motivator and an outcome of FB use. That is, feelings of disconnection (frustration of the need for relatedness) motivate people to use FB, whereas feelings of connection (satisfaction of the need for relatedness) are enhanced through positive experiences on FB (Sheldon, Abad, & Hinsch, 2011). However, there are also instances whereby FB can lead individuals to feel disconnected, such as evaluative social comparison with others (Steers, 2016). Thus FB can have either a positive or negative effect on relatedness, which in turn may either positively or negatively affect motivation. In the exercise context therefore, it is possible that engagement in types of exercise-related FB communication that enhance feelings of connection may enhance exercise motivation, whereas engagement in types of exercise-related FB communication that increase feelings of disconnection may decrease exercise motivation. Indeed, research has demonstrated that PA-related FB exchanges with existing friends lead to greater social support (and thus relatedness), and increased PA behaviour compared to private FB intervention groups (Cavallo et al., 2014; Ellison, Steinfield, & Lampe, 2007; Mabe, Forney, & Keel, 2014).

Taken together, the evidence reviewed suggests FB has the potential to increase exercise engagement through both positive (social support) and negative (maladaptive weight-related comparisons) mechanisms. To our knowledge however, no studies have directly investigated the relationship between FB use, feelings of relatedness and exercise motivation. Given the centrality of FB to the lives of undergraduate students, coupled with the poor PA levels of this population, there is a need to understand the mechanisms through which FB might help or hinder the exercise behaviour of undergraduate students. This understanding of the mechanisms through which FB use relates to exercise and PA behaviour is needed for the development of interventions. This mixed methods, multi-study investigation explored the FB use of undergraduate students, the effects this has on their relatedness needs satisfaction, and in turn on their exercise motivation. A

concurrent explanatory design (Creswell, 2013) was used to explore relationships on multiple levels, with qualitative data collected to provide an insight into potential mechanisms underpinning quantitative observations. Study 1 was a quantitative cross-sectional investigation of the relationship between types of FB use (e.g., emotional connection, social connections, and exercise-related FB use), relatedness satisfaction and exercise motivation. Study 2 employed qualitative focus groups to explore student experiences of FB use, feelings of relatedness and exercise and physical activity behaviour. It was hypothesized that greater emotional connectedness to FB, greater use of FB for social connections and greater, exercise-related FB use would be associated with higher relatedness satisfaction, which would in turn would be related to both greater autonomous and greater introjected exercise motivation.

2. Study 1: Quantitative Study

2.1 Methods

2.1.1 Participants

Adults aged 18 years and over were recruited through kinesiology and sport and exercise psychology undergraduate classes in central Canada and the north-west of England, United Kingdom to participate in a study investigating FB use and exercise motivation. Participants were approached at the beginning of the class and told about the study and provided with a link to the online questionnaire package. When participants went to the study link they were provided with a letter of information outlining the details of the study and asked to provide informed consent by clicking the appropriate button to continue the survey. Participants were eligible to participate if they were students in sport and exercise sciences or kinesiology psychology classes at the universities where the study took place. Participants were screened after providing consent

in the online questionnaire package by responding to a question asking if they were part of the psychology class. Participants who indicated they were not students were directed to the end of the survey and thanked for their time. The questionnaire took approximately 15 minutes to complete. Ethics approval for this study was obtained from the Research Ethics Board at the host university.

2.1.2 Measures

A summary of measures used, their definition and scales are presented in Table 1.

2.1.2.1 Demographic Information

Participants self-reported their age, gender, and current exercise behaviour by indicating if they exercise regularly (2-3 times per week) and if so for how many years and the average duration of their exercise session.

2.1.2.2 Facebook Use

Participants' FB use was examined using the Facebook Intensity Scale (FBI; Ellison et al., 2007), which consists of eight items that measure the frequency, duration and emotional connectedness with Facebook (e.g., "Facebook is part of my everyday activity") and is measured on a five point Likert scale (1 strongly disagree to 5 strongly agree). Three further subscales related to connection strategies were added (Ellison, Steinfield, & Lampe, 2011) and consist of social information seeking (4 items, e.g., "I have used Facebook to check out someone I met socially"), maintaining (4 items, e.g., " I use Facebook to contact a close friend"), and initiating (5 items, e.g., "I use Facebook to meet new people"). The connection strategies are scored on one

of two 5 point Likert scales (1 strongly disagree / not likely at all to 5 strongly agree / very likely). Additionally, to assess exercise-specific Facebook use, we created 11 items asking about the frequency of engaging in exercise-related activity on FB. These items were based on types of activities that people engage in on FB (Facebook, 2017), such as posting or commenting on exercise-related photos, posting exercise-related status updates, and participation in exercise-related groups. Participants were asked to rate how likely they were to engage in each activity on a 5-point Likert scale (1 not likely at all to 5 very likely). Item wording and scoring was determined based on the social connectedness strategies to maintain consistency. The Facebook Intensity Scale and connection strategies demonstrated reliability with Cronbach's alphas ranging between .67 -.86. The exercise related FB use scale demonstrated reliability with Cronbach's alpha of .86.

2.1.2.3 Relatedness

The relatedness subscale of the Psychological Needs Satisfaction in Exercise Scale (PNSE; Wilson, Rogers, Rodgers, & Wild, 2006) was used to measure relatedness in an exercise context. This subscale consists of 6 items and is scored on a 6-point Likert scale (1 not true for me to 6 very true for me). A sample item is "I feel connected to the people who I interact with while we exercise together". This subscale demonstrated reliability with a Cronbach's alpha of .93.

2.1.2.4 Exercise Motivation

The Behavioural Motivations in Exercise -3 (BREQ-3; Markland & Tobin, 2004; Wilson,

Rodgers, Loitz, & Scime, 2006) was used to assess exercise motivation. The BREQ-3 is scored on a 5-point Likert scale from 0 (not at all true for me) to 4 (very true for me). The BREQ-3 consists of 6 subscales: amotivation (4 items, e.g., "I can't see why I should bother exercising"), external regulation (4 items, e.g., "I exercise because other people say I should"), introjected regulation (4 items, e.g., "I feel guilty when I don't exercise"), identified regulation (4 items, e.g., "I exercise because it's important to me to keep fit"), integrated regulation (4 items, e.g., "I exercise because it is a fundamental part of who I am"), and intrinsic motivation (4 items, e.g., I exercise because I enjoy it"). Four additional items were added to the introjected subscale to reflect pride and self worth in exercise behaviour. These items were " I exercise because I feel proud of myself when I persist," "I exercise because I feel better about myself when I continue to participate," " I exercise because I can only be proud of myself when I continue to participate," and " I exercise regularly to prove to myself that I can persist." These additional items have been added to comprise the BREQ4. The factor structure of the BREQ-4 has been assessed using Bayesian Structural Equation Modeling. The model was estimated with the Markov chain Monte Carlo algorithm with the Gibbs sampler, with 100,000 iterations. Items were specified to have informative priors of .80 for loadings on their target factors and approximate zero cross loadings and residual correlations. All prior variances were specified at ± .01. The potential scale reduction factor stabilized at $\leq$ 1.1 after 30,600 iterations, providing evidence of acceptable convergence. The probability of the hypothesized model was good (posterior predictive p-value = .64, Δ observed and replicated χ^2 95% CI [-106.05, 71.86]). Target and cross loadings all fell within their a priori limits and only a small proportion of the residual correlations (20/435) escaped their a priori bounds (Markland, personal communication, January 30, 2018). In the

present study, reliability was demonstrated with Cronbach's alphas ranging from .80-.92 and the introjected subscale with the new items had an alpha of .90.

2.2 Data Analysis

Pearson product moment correlations were calculated to examine the relationships between FB use and exercise motivation. The main analysis required testing the indirect effects of FB use on the six behavioural motivations for exercise (amotivation, extrinsic motivation, introjected regulation, identified regulation, integrated regulation, intrinsic motivation) through the mediator of relatedness. A power calculation was conducted using MedPower (Kenny, 2017) and indicated that for a sample size of 318, alpha set to .05 power to detect mediation (indirect effects) was .945. Separate mediation analyses were conducted for each Facebook Use scale on each of the behavioural motivations. The subscales of Facebook Use were the independent variables, the behavioural motivations were the dependent variables and relatedness was the mediator. The hypotheses were tested using PROCESS (Hayes, 2013) with 1,000 bootstraps. PROCESS employs bootstrapping to estimate the size of direct and indirect effects using adjusted percentile (asymmetrical) confidence intervals. The total effect quantifies the effect of X on Y. The indirect effect (ab) is the mediation effect, which represents that effect of X on Y through M. The direct effect (c') is that two cases that differ by one unit on the independent variable (X) but are equal on the mediator (M) are estimated to differ by c' units on the dependent variable (Y). Significance of the indirect effect was tested using a bias –corrected bootstrap confidence interval based on 1,000 bootstrap samples in which the mediation effect is deemed significant if the confidence interval does not cross zero. Effect sizes are represented by Preacher and Kelley's Kappa Squared (**κ**). The mediation model is presented in Figure 1. [Figure 1 near here]

2.3 Results

Of the 318 participants that completed the online questionnaire, seven participants did not have a FB account therefore were removed from the analyses. The final sample consisted of 311 (51.4 % male) participants with an average age of 20.14 (SD = 1.82) years. Ethnicity of participants included: 67% White,13% Asian, 10% South East Asian, 5 % Black, 2% Native American and 2 % missing (n=5) data. Participants reported having exercised regularly for an average of 7.88 (SD = 4.89) years. Weight training and running were the most commonly reported exercise activities, with each exercise session lasting an average of 75 (SD = 28.08) minutes. Participants spent an average of 77 minutes (SD = 109.72) using FB every day. Missing data was less than five percent and was missing completely at random (Chi square = 26.147, DF = 33, p = .796) and replaced with Expectation Maximation (EM) in Statistical Package for the Social Sciences missing values procedures. EM uses an iterative approach to determine the most likely expected value for missing data and impute that value (Alison, 2001).

2.3.1 Correlations.

Table 2 shows the means, SDs and correlations among variables [table 2 near here]. Positive small to moderate correlations were observed between variables. FB intensity was positively correlated with external and identified and regulation, as well as relatedness. Social information seeking was positively correlated with relatedness, external, introjected and identified and regulation. Maintaining relationships was positively correlated with relatedness, external, identified and integrated regulation. Initiating was positively correlated with relatedness and integrated regulation. Exercise-related FB use was positively correlated with relatedness, amotivation, external, introjected and integrated regulation.

2.3.2 Mediation Analysis

Complete mediation results are presented in Figures 2-7, including unstandardized beta weights for direct effects, indirect effect and total effects. A summary of the significant mediation (indirect effects) are presented in Table 3.

2.3.2.1 Amotivation (figure 2)

Total effects on amotivation were significant for FB intensity (b = .06, p = .036) and exercise-related FB use (b = .10, p =.023), but significant indirect effects were observed for exercise-related FB use only (b= -.03, 95% CI .04-.16). Participants who engaged in greater exercise-related FB use had greater feelings of relatedness and participants with greater relatedness had less amotivation.

2.3.2.2 External regulation (figure 3)

Total effects for all FB scales, except for Initiating, were independently and positively related to external regulation. Indirect effects were not significant for any of the FB subscales on external regulation. [Figures 2 and 3 near here]

2.3.2.3 Introjected regulation (figure 4)

Total effects were significant between FB intensity (b =.26, p =.030), social information seeking (b =.31, p <.001), maintaining relationships (b =.24, p =.023), and exercise-related FB use (b =.24, p =.04), and introjected regulation. Indirect effects were significant for all five FB subscales and introjected regulation. (FB intensity, b =.08, 95% CI .02,.17; social information seeking, b =.06,(.02, .13); maintaining relationships, b =.07, (.03, .26); initiating relationships. b =.07, (.03, .21 exercise related FB use, b =.09, (.04, .17)). Participants who scored higher on FB Intensity, FB Initiating, Social information seeking, Maintaining relationships and Exercise related FB use had greater relatedness and participants with greater feelings of relatedness had increased introjected regulation. [Figure 4 near here]

2.3.2.4 Identified regulation (figure 5)

Total effects were significant between FB use for maintaining relationships (b =.17, p =.023) and exercise-related FB use (b =.22, p =.005) on identified regulation. Indirect effects were significant for all five subscales of FB use on identified regulation. (FB intensity, b =.11., 95% CI (.06, .28); social information seeking, b =.09, (.05, .26); maintaining relationships, b =.15, (.03, .23); initiation relationships, b = .15 (.03, .023) exercise related FB use, b =.**13**, (.10, .29). Greater FB use was associated with higher levels of relatedness and greater feelings of relatedness was associated with greater identified regulation. [Figure 5 near here]

2.3.2.5 Integrated regulation (figure 6)

All FB subscales had significant total effects on integrated regulation except for initiating relationships. (FB intensity, b =.17, p =.032; social information seeking, b =.17, p =.009; maintaining relationships, b =.28, p <.001; exercise related FB use, b =.14, p=.001 Indirect effects were significant between all five types of FB use (FB intensity, b =.11 (.03-.20); social information seeking, b =.08 (.02-.16); maintaining relationships, b =.10 (.03-.18); initiating, b =.11, (.04-.19); and exercise related FB use, b =.13, (.07-.21)) and integrated regulation. Participants who had higher FB intensity, social information seeking, maintaining and initiating relationships and exercise-related FB use had higher feelings of relatedness and participants with greater feelings of relatedness had greater integrated regulation. [Figure 6 near here]

2.3.2.6 Intrinsic (figure 7)

There were no significant total effects found between FB use and intrinsic motivation. However, indirect effects were significant for all five all five FB subscales and intrinsic motivation. Participants who scored higher on Facebook intensity, social information seeking, maintain and initiating relationship and exercise-related FB use had greater relatedness and participants with greater feelings of relatedness had increased intrinsic motivation. [Figure 7 near here]

[Table 3 near here]

2.4 Discussion

Study 1 investigated relationships between FB use, relatedness and exercise motivation. Different types of FB use had associations with amotivation, and external and introjected regulation. However, all types of FB use were related to more autonomous forms of motivation only when mediated by relatedness, with the exception of integrated regulation, for which only FB use for maintaining relationships and exercise related FB was related to motivation through relatedness. FB use was associated with greater relatedness satisfaction, which in turn was associated with reduced amotivation, increased introjection and increased autonomous motivation (identified, integrated and intrinsic). These results are in line with previous SDT research indicating that needs satisfaction is associated with more autonomous forms of motivation (Teixeira et al., 2012). Moreover, the current study provides novel findings for the impact of FB use on exercise motivation, suggesting that when relatedness is present, FB may have a positive impact on autonomous exercise motivation. The relationship between types of FB use and relatedness on introjected regulation are in line with previous studies that have demonstrated a relationship between relatedness and introjection (Kinnafick, Thogersen-Ntoumani, & Duda, 2014; Markland & Tobin, 2010; Rahman et al., 2011), possibly due to the feelings of internal pressure that might arise as peer relationships develop in exercise contexts (i.e., attending an exercise class for fear of letting others down). As noted earlier, however, such introjection need not have a negative effect on exercise adherence if autonomous motivation is also present (Markland & Ingledew, 2007).

Associations between exercise-specific FB use were evident with amotivation, external regulation and introjected regulation. Since the measures used in this study provided no information about the content and interpretation of exercise-specific FB material, it is not

possible to determine the reasons why FB might lead to amotivation or controlled motivation. It is plausible however that motivation may have been negatively influenced by evaluative social comparisons, or experiences of disconnection that arise from certain forms of FB use (Steers, 2016). It is also noteworthy that no measure of disconnection was collected, therefore further research is required to explore the potential effect of FB-related disconnection on exercise motivation.

Study 2 was conducted concurrently with Study 1. The aim of Study 2 was to use qualitative focus groups to explore student experiences of FB use, feelings of relatedness and exercise and PA behaviour. A broader focus on PA was adopted to allow participants to discuss experiences related to sport, lifestyle activity and/or exercise.

3. Study 2: Qualitative

3.1 Methods

3.1.1 Participants and procedure

Twenty-four undergraduate students (from the same UK university as study 1, but a different cohort) were invited to take part in a qualitative study exploring the relationship between FB and PA. Students were identified on the basis of their studying applied sports psychology and being known to the researcher [third author]. To be eligible for the study students needed to hold a FB account that they accessed at least once a week. Of the 24 students who were invited, 19 consented to take part (32% male; age range 19-25 years). Participants each took part in one focus group lasting between 30 and 60 minutes. Focus group make-up was determined by participant availability, although where possible groups were gender-specific and participants were encouraged to attend in friendship groups, since shared social culture can enhance focus group interactions (Kitzinger, 1994). Four focus groups were conducted in total,

two female-only (n=5, n=6), one male-only (n=4) and one mixed gender (n=4). Ethical approval was granted by the departmental ethics committee at the university where data was collected.

3.1.2 Focus groups

All focus groups were facilitated by an undergraduate peer of the participants [third author] who had been trained in qualitative methods and focus group facilitation. It was felt this peer facilitation enhanced the authenticity of the data through creating a natural environment that allowed participants to be themselves (creating a "fly on the wall effect"). This shared rapport encouraged honest reflections and the use of informal expressions that participants might have been reluctant to use if interviewed by someone in a position of power (e.g., a university tutor). The interview guide was semi-structured in nature, designed to explore participant experiences of exercise and PA-related FB interactions, motivation, and the role FB plays in relatedness (both connection and disconnection). Participants were first asked some general questions about their involvement in PA, then were asked to give examples of ways they thought FB could be used to talk about PA. This was followed by several open questions about their own experiences, such as "Can you tell me about your experiences in regards to FB and your participation in PA?", "How does your FB use relate to your PA motivation?", and "How does your FB use influence how connected you feel with others in regards to your PA?" Each open question was followed with more direct probes asking for positive and negative examples (e.g. "Can you give any examples of how FB makes you feel connected with regards PA?" (positive); "Can you give any examples of how FB makes you feel disconnected with regards PA?" (negative)). Further prompts and probes were used flexibly to elicit a deeper understanding of issues raised.

3.2 Analysis

Data were transcribed verbatim, yielding 45 pages of raw data for analysis. An inductive thematic analysis (Braun & Clarke, 2006) was conducted to allow themes and subthemes to

emerge from the data. Initial codes were produced through tagging and naming selections of text that could potentially form the basis of repeated patterns (themes) across the data. These codes were then compared and contrasted to form subthemes which were further organized into overarching themes. All analysis was conducted by [third author] with regular meetings with [second author] to review emerging themes for conceptual meaning, clarity and representativeness of the data. The thematic structure was modified throughout this process, until both researchers were in agreement the final themes presented an authentic and meaningful representation of participant views.

3.3 Results

Four overarching themes were identified in relation to the role of FB in exercise motivation: connection (promotes exercise), disconnection (discourages exercise), social comparison (both promotes and discourages exercise), and health-negating features of FB (discourages exercise). Participant experiences suggested FB can act as both a positive and a negative influence on exercise motivation. In the text that follows, each theme is explained in turn, with illustrative quotes to support the narrative. Participants are identified by focus group number (FG1, FG2 etc.), participant number within each group (P1, P2 etc.) and gender (male, female).

3.3.1 Connection

Several examples were provided to demonstrate how exercise-related interaction on FB increased relatedness through feelings of connection with others. One student described how sharing their interest in sport through FB brought them closer to their friends, another explained how use of a FB group brought their football team closer together.

When I share posts or my mates share posts or videos of football or whatever it kind of makes you feel closer to *each other…you've got the same interests and I suppose without seeing that*

stuff on FB and interacting with each others' stuff you wouldn't necessarily have had that extra contact with your friends (FG4/P4/male)

We have a FB chat for the whole football t*eam…talking about training and arranging the socials* on FB makes us more connected together as a team (FG2/P5/female)

In turn, the PA-related interaction that occurred through FB motivated students to take part so they could see their friends (FB connection promoted PA which in turn promoted further connection).

Before training someone will always post 'who's coming'…seeing who's engaging in the posts makes you want to go as you know you're gonna see your mates (FG2/P4/female)

3.3.2 Disconnection

Conversely, some students described experiences in which PA-related FB activities led to relatedness frustration through feelings of disconnection, which in turn discouraged them from participating in PA.

You can see exactly what your FB friends are doing, what they are liking, who they are talking *to or whatever…you can feel disconnected to people when you no longer kind of interact with each other's stuff, or you might see that your one mate has been tagged in a picture and you wasn't invited along…so* it could make you feel disconnected in that sense too (FG3/P2/female)

Where changes in circumstances had disconnected students from past sports teams, having access to team-related information on FB heightened the lack of relatedness they were feeling.

I feel disconnected to the people in my old football team…I see all their stuff on FB and I kind of wish I was still playing with them but obviously I'm not so I don't have anything in common with them anymore (FG4/P6/male)

Whilst in other situations, students (particularly female focus groups) described active needs thwarting behaviours from others, and the detrimental effect this might have on their PA motivation.

*On FB people can be very judgemental…you often see people sharing stuff that are takin*g the *mick out of people and their hard work…some people may get put off* [from PA]…in fear that they are going to get criticised (FG3/P5/female)

Such judgement from FB peers led some students to "disconnect from their disconnections" to prevent their feelings of relatedness frustration having a negative effect on their exercise behaviour. The following student shared how she had been judged on FB and received negative comments from friends when she was posting pictures of her weight-lifting progress, which led the student to "unfriend" those friends on FB.

I recently deleted like loads of people the other week… I would say they were my best friends at one time, but since I've kind of moved to uni…when I was training they were really horrible to me about i*t, so they're the sort of people that I haven't got anything in common with anymore so I thought 'what's the point of having them on FB'* (FG1/P1/female)

3.3.3 Social comparison

One of the reasons FB was perceived to influence students' PA motivation (both positively and negatively) was the ease with which FB allowed students to compare themselves with others. For many students, viewing others' PA experiences was perceived as a motivator.

If I see like a gym video getting shared loads I'll watch it and it will make me feel motivated and want to do more physical activity (FG4/P4/male)

In some cases however, students' motives for PA were extrinsic (e.g., aesthetics, need for approval): When they [people in the fitness business] *post like pictures of themselves, so it's like motivation…'I wanna look like that so I'm gonna go to the gym rather than sit at home'* (FG1/P2/female)

When people post progress pictures it kind of motivates you to keep going the gym and train *hard…especially 'cos you see all the praise they are getting so it makes you think if you were to* do it, like you would get recognition for all your hard work (FG4/P1/male)

For some students, social comparison reduced their perceived competence or led to feelings of body dissatisfaction, which in turn discouraged them from participating in PA.

When I see people who are really progressing in their physical activity it makes me feel *disconnected to them as well, because I haven't been doing anything and I guess it kind of stops* me from re-*starting as I feel I'd be crap in comparison*" (FG4/P6/male)

When I see people's progress pictures or just pictures in general with girls with tiny frames…I kind of automatically get demotivated as I know I could never really achieve that (FG3/P5/female)

3.3.4 Health-negating features of FB

Finally, the nature of FB itself was seen as a de-motivator for PA, firstly through the extent of food-related interactions students are exposed to, and secondly due to the sedentary nature of engaging with FB itself.

When you see like unhealthy kind of food, or proper high calorie food or when people are saying *they are going to the pub or whatever it always makes me think 'what's the point doing PA now if I'm just gonna consume all these calories'* (FG4,P1, male)

Sometimes I'll plan to go to the gym and I'll sit in my gym stuff ready to go and I'll go on FB for *a while…there has been occasions where I've sat there for that long that I don't end up going* [to the gym] (FG3/P3/female)

3.4 Discussion

Study 2 provided a qualitative insight into undergraduate students' experiences of exercise and PA-related FB interactions and the effects these have on their motivation and behaviour. Data suggested exercise and PA-related interactions were common in this group of sports psychology students, although the effect of these interactions on motivation could be either positive or negative. As suggested in previous literature (Ellison 2007; Cavallo et al., 2014; Mabe et al., 2014), connection was achieved through interactions with existing peers about PA and this in turn promoted active PA participation. Conversely, disconnection occurred through both feelings of "being left out" (needs neglect) and instances of cyber-bullying from FB friends (needs thwarting).

Recent literature (Vansteenkiste & Ryan, 2013) suggests a distinction needs to be made between "needs-neglectful" behaviours that lead an individual to experience a lack of needs satisfaction (where the feelings are driven by internal perceptions) and "needs-thwarting" behaviours that lead to feelings of needs frustration (where the feelings are driven by external actions of others), with the latter being more harmful for psychological wellbeing.

The other dominant theme in the data was the social comparison inherent in FB. There seemed to be some individual variation in how students interpreted PA-related posts from others, and the

effect this had on their own PA motivation. For some students, seeing positive role models appeared to heighten their PA motivation, although their motives were extrinsic and their motivation introjected. For other students however, the lack of perceived similarity between the model (e.g., "girls with tiny frames") and themselves (Bandura, 1996), de-motivated them from PA since they perceived no point in trying.

4. General Discussion

The first aim of this research was to determine the relationship between FB use, relatedness and exercise motivation. It was hypothesized that greater FB use would be associated with higher levels of relatedness and in turn greater autonomous and introjected regulation. In support of this hypothesis, we found that the relationships between all five types of FB use and autonomous motivations, introjected regulation and amotivation were mediated by relatedness. More specifically, through feelings of relatedness, FB use was associated with greater autonomous forms of motivation, including identified, integrated and intrinsic motivation, greater introjected regulation and less amotivation. Additionally, the intensity of FB use, which reflects the duration, frequency and emotional connectedness to FB, had associations with external and introjected regulation. The second aim of this investigation was to qualitatively explore student experiences of FB use, feelings of relatedness and exercise and physical activity behaviour. Key findings indicated that PA-related FB experiences have both positive and negative influences on motivation dependent on whether FB use leads to connection or disconnection, and how individuals interpret posts from others with reference to their self.

It is widely accepted that autonomous motivation is associated with greater PA (Teixeira et al., 2012; Thogersen-Ntoumani & Ntoumanis, 2006). We found that all types of FB use, with the exception of using FB to initiate relationships were associated with both greater introjected regulation. However, a different pattern emerged for more autonomous forms of motivation.

Specifically, only FB use of maintaining social relationships and exercise related FB use was associated with greater integrated regulation. FB use was related to intrinsic motivation only when relatedness was present, thus suggesting relatedness may be more important in the development of autonomous motivation, including intrinsic motivation than previously thought. This notion is supported by the fact that relatedness also mediated the relationship between all types of FB use and other autonomous forms of motivation (identified, integrated), and that when friends shared a common interest in PA on FB, this connection increased their motivation to engage in PA. The current findings are consistent with research that has demonstrated that psychological well-being and self -esteem (Abellera, Ouana, Conway, Camilotes, & Doctor, 2012) are enhanced through FB use when feelings of relatedness or social support (Hu, Kim, Siewek, Wilder, 2017) are present. Indeed, interactions with good friends on FB contributes to well being (Abellera et al., 2012). College students not only have large declines in physical activity (Kilpatrick et al., 2005), but also spend a significant amount of time engaged with FB (Bicen & Carvus, 2011). Given that FB is known to increase feelings of connection (Sheldon et al., 2011), interventions that foster exercise-related connections (i.e., relatedness) via FB could offer a means of promoting PA for student populations. Indeed, research has demonstrated PA-related FB exchanges with existing friends lead to greater feelings of relatedness and increased PA behaviour (Cavallo et al., 2014; Ellison et al., 2007; Mabe et al., 2014).

In addition to the mediated relationships with autonomous motivation, we found higher FB use was directly (with the exception of initiating relationships through FB) and indirectly (through relatedness) linked to introjected regulation. Despite general findings that controlled forms of motivation tend to be maladaptive for PA behavior (Teixeira et al., 2012) and psychological wellbeing, there is some evidence to suggest introjected regulation is associated with greater PA and exercise participation (Thogersen-Ntoumani & Ntoumanis, 2006), and when

accompanied by autonomous forms of motivation psychological wellbeing may be preserved (Markland & Ingledew, 2007). Our findings shed some light on the potential positive and negative functions of introjection. It is plausible introjected regulation might serve an adaptive motivational function (without harming psychosocial wellbeing) when the basic need of relatedness is met (and feelings of introjection stem from not wanting to let others down). Indeed, relatedness plays an important part in adherence to group-based exercise programmes (Kinnafick et al., 2014; Rahman et al., 2011). Introjected regulation may be maladaptive, however, when focused on imagined approval from others or contingent self-esteem (Ryan & Deci, 2017). Responses in Study 2 highlighted that seeing others' exercise-related FB posts increased introjected regulation as students wanted to engage in PA to "look like" others or to receive the same approval for their efforts that others had received. Although we found these egocentric desires did motivate participants to engage in PA, if not accompanied by more autonomous regulations such introjected motives may be damaging for psychosocial wellbeing (Markland & Ingledew, 2007).

Although exercise-related FB use made some participants feel more connected and motivated to be active, results from both Study 1 (showing a positive association between exercise-specific FB use and amotivation) and Study 2 (showing instances of disconnection and needs thwarting) suggest there is a maladaptive side to exercise-related FB use, analogous to that reported by Sheldon et al. (2011). Some participants found that seeing their friends engaged in activity without them led to feelings of disconnection (i.e., needs neglect) and others described instances of unkind posts from others (i.e., active needs thwarting), both of which decreased motivation. The concept of psychological need thwarting has been proposed as the mechanism through which negative dimensions of social interaction lead to ill-being (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2011). Indeed, illbeing and negative outcomes in sport

result from needs thwarting (Bartholomew et al., 2011). For some students, seeing others' progress in PA goals led to feelings of disconnection and negative self-perceptions about their body. This finding supports previous research indicating that FB use can be associated with weight dissatisfaction and negative body image (Tiggermann & Slater, 2013). Although these feelings of dissatisfaction have been found elsewhere to lead to increases in PA behavior (Anderson & Bulik, 2004; Brudzynski & Ebben, 2010), the students in our study were demotivated by their negative social comparisons. Whilst it is not possible to tell from the current data what role individual psychological characteristics played in responses to FB use, individual difference research shows the effect of FB on psychological wellbeing varies with personality (Hu et al., 2017) and with attachment styles (Lin, 2016). For example, those who worry that others will leave them (anxious attachments) use FB to satisfy needs for relatedness that is in turn related to positive well being (Lin, 2016). Thus, further research is required to understand the ways in which individual differences affect the relationship between FB, relatedness and exercise motivation.

This study is the first to examine how forms of FB interaction, including overall intensity of FB use, employing FB for social connections and exercise related FB use influences exercise motivation. This novel approach is timely, given the pervasive nature of social media outlets such as FB at a societal level and the concerning rates of physical inactivity. The mixed methods approach is a strength of this research, with the cross-sectional quantitative data providing evidence of the relationship between FB use and exercise motivation, and the qualitative data elucidating potential mechanisms underpinning this relationship. There are however, limitations that need to be taken into consideration. First, the PNSE does not measure disconnection. Whilst our qualitative data is suggestive of a maladaptive ink between FB, disconnection and amotivation, further research is required to substantiate these links with

quantitative data. Second, PA and exercise are conceptually different, however Study 1 focused on exercise behavior, whereas, Study 2 discussed PA in a broader context. Nevertheless, it is important to note the majority of examples used in Study 2 were either sport or exercise-related. Third, although the distinction between positive and negative interactions was present in Study 2, it is not possible from the Study 1 measures to tell whether the FB interactions were positive or negative. This will likely have an important influence on exercise motivation; therefore, the development of tools to explore the valence of FB interactions may be worthwhile. Fourth, it is noteworthy that study 1 (quantitative) and study 2 (qualitative) participants were drawn from different populations, thus whilst the qualitative data can provide some insight into potential mechanisms underpinning the FB and exercise motivation relationship, this data cannot be taken as specific explanatory evidence of the study 1 observations. It must be noted also that participants in both studies were from sport-related programs, therefore their exercise-related FB behavior may differ from others by virtue of their interest in sport and exercise. Fifth, given that the majority of the sample is Caucasian, the countries in which the study took place are similar and that the students are all studying sport and exercise-related classes, the results may not generalize to other students with different academic backgrounds, race and in different countries. In addition, exercise motivation may have been influenced by income and education background however, income and education were not included in the mediation analyses. Lastly, it is important to note limitations to meditational research within cross sectional data. While mediation effects provide important information about the relationships between FB, relatedness and exercise motivation, it is possible that the temporal ordering of the variables may be incorrect. However, previous research has demonstrated that feelings of relatedness result from using FB (Sheldon et la., 2011). Future research may consider employing a longitudinal approach to confirm temporal ordering of the variables within these relationships.

4.1 Conclusion and recommendations

PA levels in undergraduate students have declined to levels that are not sufficient for health benefits (Kilpatrick et al., 2005). As such, this is an important population to focus PA interventions. Using a mixed methods approach, the aim of this research was to investigate the relationships between FB use, relatedness and exercise motivation and the mechanisms that underpin these relationships. Our findings suggest that providing supportive PA environments within FB that promote relatedness and support may be a successful avenue to promote PA participation for the student population. We did however identify a potential maladaptive side of FB resulting from social comparisons, active needs thwarting (e.g., bullying), and needs neglect (e.g., feeling left out).

Further research is needed to investigate this maladaptive side of FB use on exercise motivation and the impact of individual differences. Finally, this research provided a novel insight into the nature of introjected regulation and the different ways introjection may impact exercise behaviour and wellbeing. Further research is warranted to conceptualize the different elements of introjection and their relationship with exercise and wellbeing.

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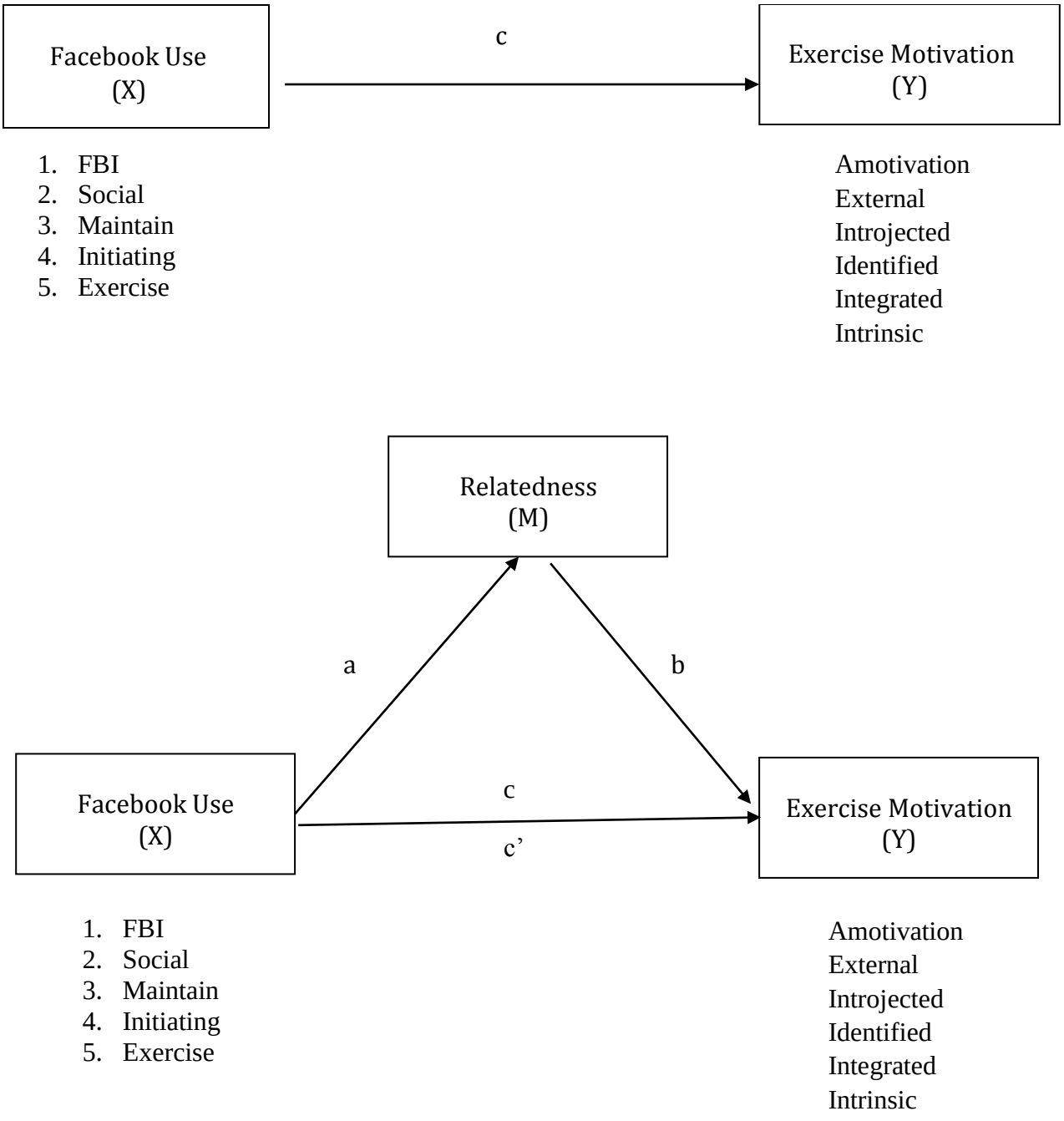

Figure 1. Mediation model for total, direct and indirect effects. The direct effect quantifies the effect of X on Y. The indirect effect (ab) is the mediation effect, which represents that effect of X on Y through M. The total effect (c') is that two cases that differ by one unit on the independent variable (X) but are equal on the mediator (M) are estimated to differ by c' units on the dependent variable (Y).

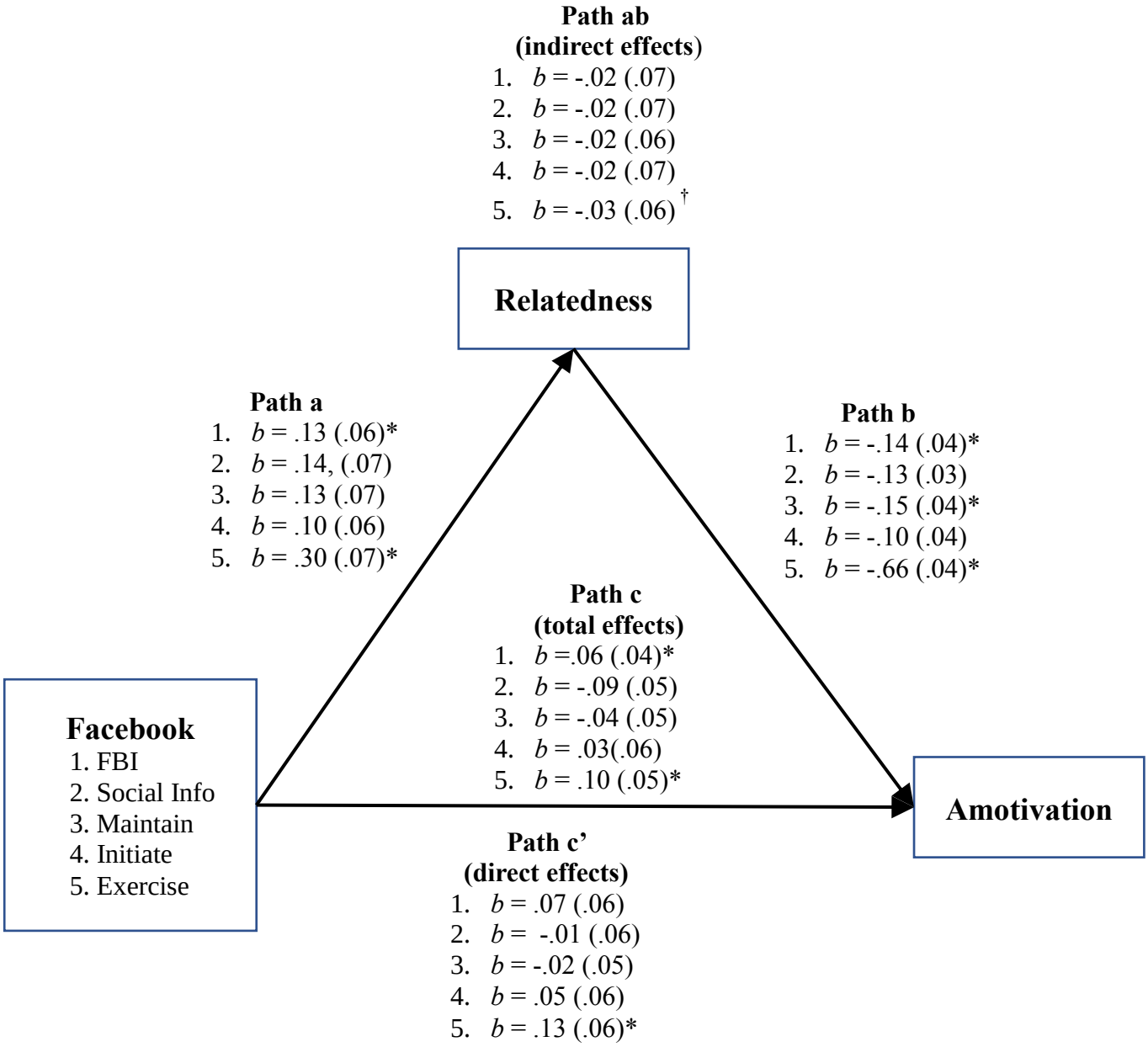

Figure 2. Results of the mediation models for the effects of Facebook Use on Amotivation. Unstandardized beta coefficients and standard errors in (SE) are presented. FBI, Facebook Intensity Scale; Social Info, Social Information Seeking; Maintain, Maintaining Relationships, Initiating, Initiating Relationships; Exercise, Exercise related Facebook use. Significance of pathways are indicated with * for p<.005 and ** for p<.001. Significant indirect effects are indicated with a †, where 95% confidence intervals do not contain zero.

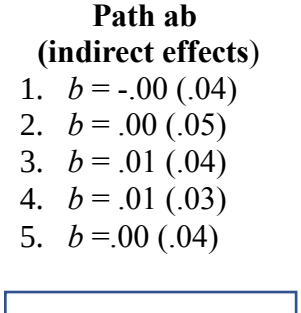

Figure 3. Results of the mediation models for the effects of Facebook Use on External regulation. Unstandardized beta coefficients and standard errors in (SE) are presented. FBI, Facebook Intensity Scale; Social Info, Social Information Seeking; Maintain, Maintaining Relationships, Initiating, Initiating Relationships; Exercise, Exercise related Facebook use. Significance of pathways are indicated with * for $p<.005$ and ** for $p<.001$. Significant indirect effects are indicated with a †, where 95% confidence intervals do not contain zero.

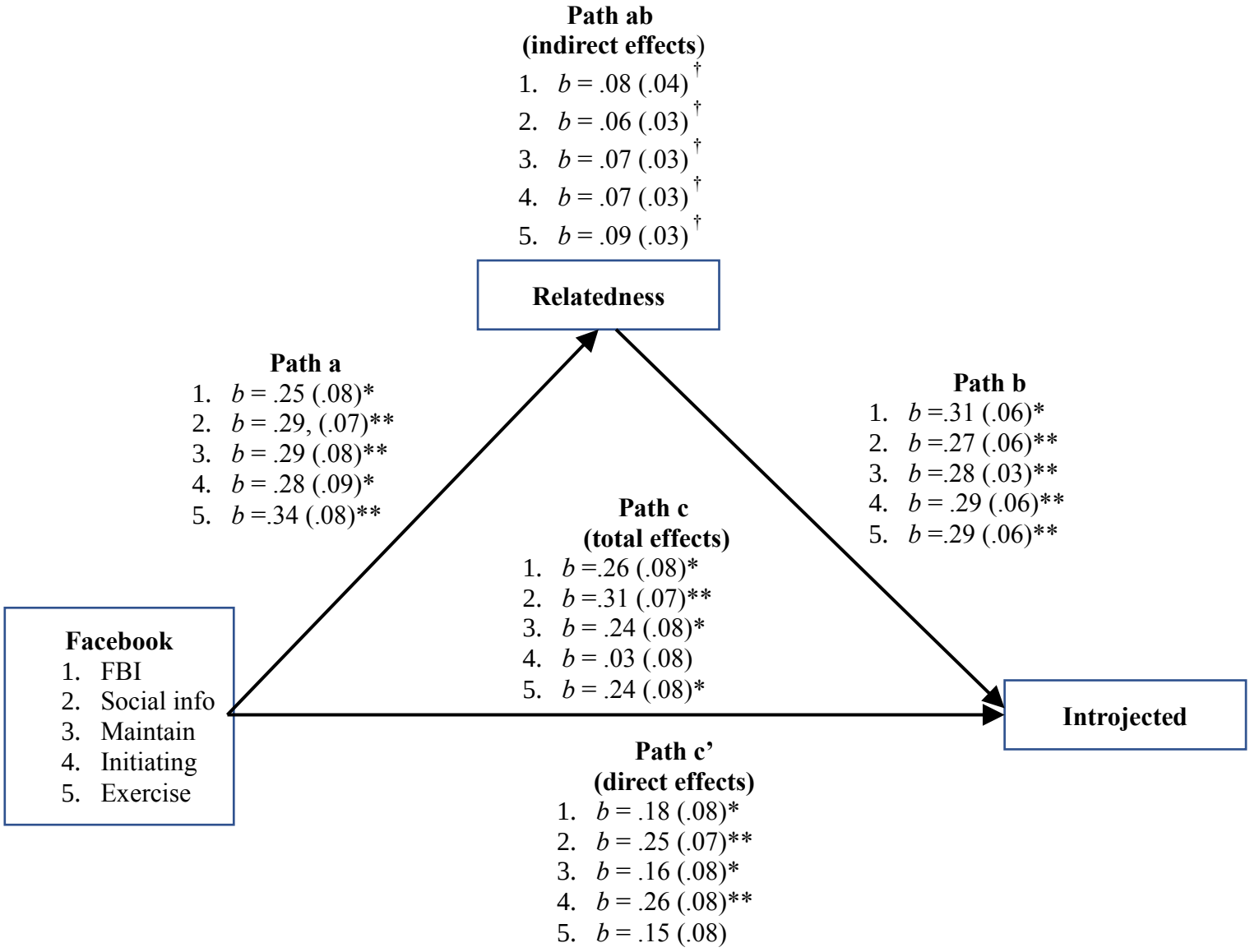

Figure 4. Results of the mediation models for the effects of Facebook Use on Introjected regulation. Unstandardized beta coefficients and standard errors in (SE) are presented. FBI, Facebook Intensity Scale; Social Info, Social Information Seeking; Maintain, Maintaining Relationships, Initiating, Initiating Relationships; Exercise, Exercise related Facebook use. Significance of pathways are indicated with * for p<.005 and ** for p<.001. Significant indirect effects are indicated with a †, where 95% confidence intervals do not contain zero

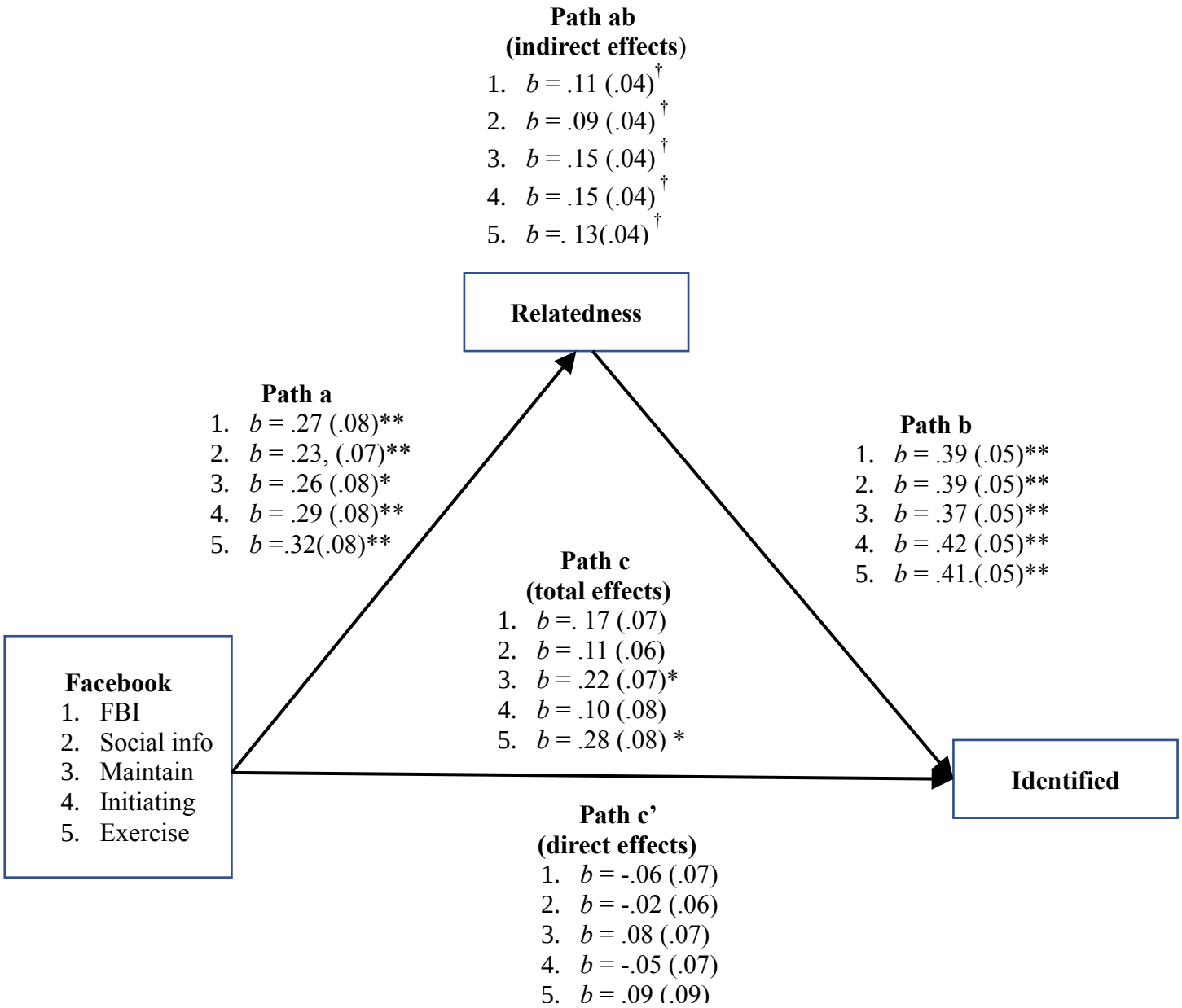

Figure 5. Results of the mediation models for the effects of Facebook Use on Identified regulation. Unstandardized beta coefficients and standard errors in (SE) are presented. FBI, Facebook Intensity Scale; Social Info, Social Information Seeking; Maintain, Maintaining Relationships, Initiating, Initiating Relationships; Exercise, Exercise related Facebook use. Significance of pathways are indicated with * for p<.005 and ** for p<.001. Significant indirect effects are indicated with a †, where 95% confidence intervals do not contain zero

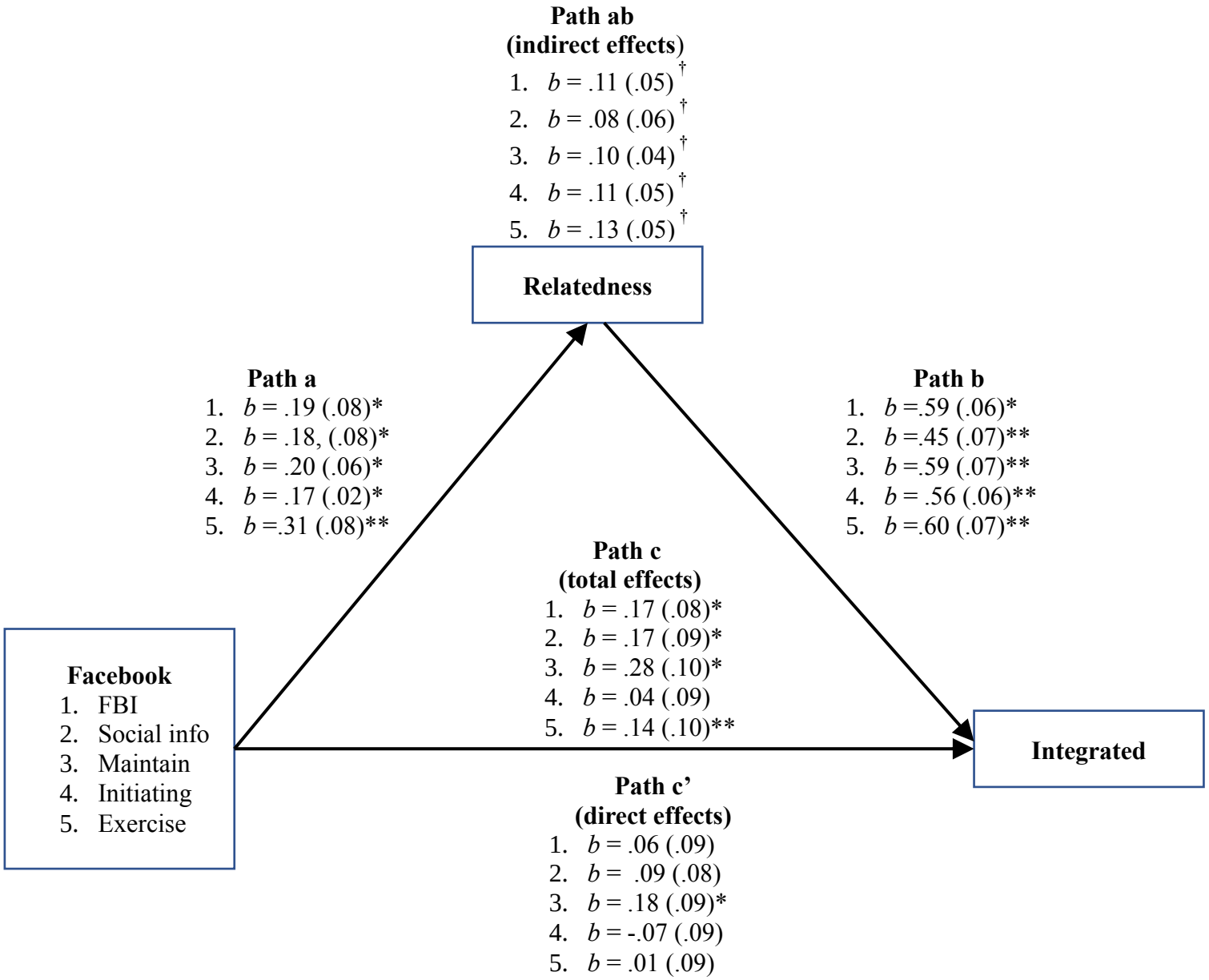

Figure 6. Results of the mediation models for the effects of Facebook Use on Integrated regulation. Unstandardized beta coefficients and standard errors in (SE) are presented. FBI, Facebook Intensity Scale; Social Info, Social Information Seeking; Maintain, Maintaining Relationships, Initiating, Initiating Relationships; Exercise, Exercise related Facebook use. Significance of pathways are indicated with * for p<.005 and ** for p<.001. Significant indirect effects are indicated with a †, where 95% confidence intervals do not contain zero

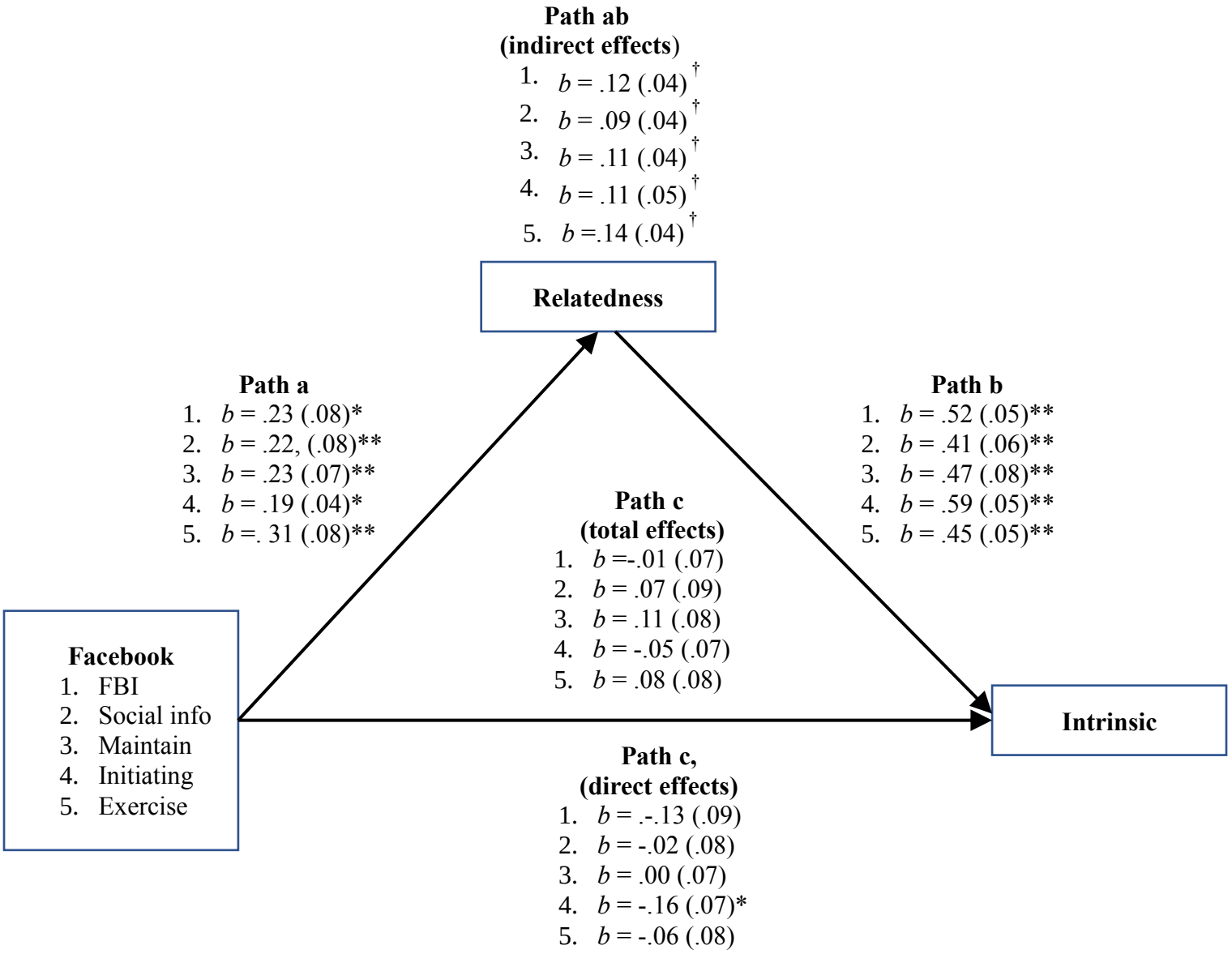

Figure 7. Results of the mediation models for the effects of Facebook Use on Intrinsic regularion. Unstandardized beta coefficients and standard errors in (SE) are presented. FBI, Facebook Intensity Scale; Social Info, Social Information Seeking; Maintain, Maintaining Relationships, Initiating, Initiating Relationships; Exercise, Exercise related Facebook use. Significance of pathways are indicated with * for p<.005 and ** for p<.001. Significant indirect effects are indicated with a †, where 95% confidence intervals do not contain zero

Table 1. Summary of Measures

	Definition	Scale	Alpha
Motivation (Behavioral Regulation in Exercise Questionnaire-3)			
Amotivation (4 items)	Lack of exercise motivation	Not at all true for me (0) – very true for me (4)	.80
External (4 items)	Exercising for external pressures such as financial rewards	Not at all true for me (0) – very true for me (4)	.84
Introjected (8 items)	Exercising due to internal pressures such as seeking approval from others or avoiding guilt	Not at all true for me (0) – very true for me (4)	.90
Identified (4 items)	Exercising because you value the benefits of exercise such as improved health	Not at all true for me (0) – very true for me (4)	.84
Integrated (4 items)	Exercising because the activity is seen as part of the self	Not at all true for me (0) – very true for me (4)	.87
Intrinsic (4 items)	Exercising for the inherent enjoyment of the activity	Not at all true for me (0) – very true for me (4)	.92
Facebook Use (Facebook Intensity Scale, Ellison et al. 2007; Ellison et al., 2011)			
Facebook Intensity (8 items)	Frequency, duration and emotional connectedness with Facebook	Strongly disagree(1) -strongly agree (5)	.86
Social Information Seeking (4 items)	How likely people are to use Facebook to learn more about someone they met socially	1 item, Not at all likely (1) – very likely (5) 3 items, Strongly disagree (1) – strongly agree (5)	.83
Maintaining Relationships (4 items)	The degree to which people use Facebook to maintain relationships with existing friends.	2 items Strongly disagree (1) to strongly agree (5) 2 items, Not at all likely (1) – very likely (5)	.84
Initiating Relationships (4 items)	How likely people are to use Facebook to initiate a relationship with a stranger	3 items, Not at all likely (1) – very likely (5) 1 items, Strongly disagree (1) – strongly agree (5)	.67
Exercise related Facebook use (11 items)	How likely people are to engage in exercise-related Facebook activities based on the features of Facebook.	Not at all likely (1) – very likely (5)	.86
Relatedness (Psychological Needs Satisfaction in Exercise, Wilson et al., 2006)			
Relatedness (3 items)	Feeling meaningful connections to others in an exercise context	Not true for me (1) – very true for me (6)	.93

Table 2. Correlations, Means and Standard Deviations for Facebook use, Relatedness and Exercise Motivation

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Facebook Intensity	1											
2. Social information seeking	.37**	1										
3. Maintaining relationships	.34**	.40**	1									
4. Initiating relationships	.35**	.55**	.37**	1								
5. Exercise related FB use	.39**	.39**	.29**	.38**	1							
6. Relatedness	.19**	.17**	.19**	.18**	.29**	1						
7. Amotivation	.04	-.04	-.05	.03	.11*	-.14*	1					
8. External regulation	.22**	.22**	.14*	.09	.22**	.04	.22**	1				
9. Introjected regulation	.17**	.25**	.17**	.29**	.17**	.31**	-.17**	.27**	1			
10. Identified regulation	.12*	.15**	.22**	.03	.11	.43**	-.35**	.046	.60**	1		
11. Integrated regulation	.09	.07	.13*	.06	.16**	.47**	-.31**	-.04	.50**	.69**	1	
12. Intrinsic motivation	-.01	.06	.08	-.04	.05	.44**	-.32**	-.14*	.33**	.62**	.68**	1
Mean	3.76	3.30	4.24	2.66	2.04	4.43	1.31	2.48	4.53	5.95	5.19	5.12
Standard Deviation	.81	.96	.85	.81	.84	1.18	1.26	1.26	1.17	1.08	1.47	1.11

Note: Significance; ** $p < .001$. * $p < .05$.

Table 3. Summary of Significant Mediation Results Between Facebook Use and Exercise Motivation via Relatedness

	Path a	Path b	Total Effect (path c)	Indirect effect (Path ab)		Direct Effect (Path c')	Effect Size
Facebook Use			**b** (SE)	**B 95% CI**		**b**	**κ**
			Amotivation Motivation				
Exercise - Related	.30 (.07)*	-.66 (.04)**	.10 *	-.03†	(-.08, - .01)	.10 (.06)*	.04
			Introjected regulation				
Total Intensity	.25 (.08)	.31 (.06)*	.26 (.08)*	.08†	(.02, .12)	.18 (.08)*	.05
Social Information Seeking	.29 (.07)**	.27 (.03)**	.31 (.08)**	.06†	(.02, .12)	.25 (.07)**	.05
Maintaining Relationships	.29 (.08)**	.28 (.06)**	.24 (.07)*	.07†	(.02, .15)	.16 (.08)*	.05
Initiating Relationships	.28 (.09)**	.29 (.06)**	.03 (.08)	.07†	(.02, .12)	.26 (.08)**	.05
Exercise -Related	.34 (.08)**	.29 (.06)**	.24 (.08)*	.09†	(.04, .16)	.15 .(08)	.05
			Identified regulation				
Total Intensity	.27 (.08)**	.39 (.05)**	.17 (.07)*	.11†	(.03 - .20)	-.06 (.07)	.08
Social Information Seeking	.23 (.07)**	.39 (.05)**	.11 (.06)*	.08†	(.02 - .16)	-.02 (.06)	.08
Maintaining Relationships	.26 (.08)*	.37 (.05)**	.22 (.07)*	.10†	(.03 - .18)	.08 (.07)*	.08
Initiating Relationships	.29 (.08)**	.42 (.05)**	.10 (.08)	.10†	(.04 - .19)	-.05 (.07)	.08
Exercise -Related	.32 (.08)**	.41 (.05)**	.28 (.08)*	.13†	(.07 - .21)	.09 (.07)	.10
			Integrated				
Total Intensity	.19 (.08)*	.59 (.06)*	.17 (.08)*	.16†	(.06, .28)	.06 (.09)	.09
Social Information Seeking	.18, (.08)*	.45 (.07)**	.17 (.00)*	.15†	(.05, .26)	.09 (.08)	.09
Maintaining Relationships	.20 (.06)*	.59 (.07)**	.28 (.10)*	.15†	(.04, .27)	.18 (.09)*	.09
Initiating Relationships	.17.02)*	.56 (.06)**	.04 (.09)	.12†	(.03, .23)	-.07 (.09)	.09
Exercise -Related	.31 (.08)**	.60 (.07)**	.14 (.10)**	.18†	(.10, .29)	.01 (.09)	.11
			Intrinsic Motivation				
Total Intensity	.23 (.08)*	.52 (.05)**	-.01 (.07)	.12†	(.04 - .22)	-.13 (.09)	.09
Social Information Seeking	.22 (.08)**	.41 (.06)**	.07 (.09)	.09†	(.03 - .17)	-.02 (.08)	.09
Maintaining Relationships	.23 (.07)**	.47 (.08)**	.11 (.08)	.11†	(.03 - .20)	.00 (.07)	.09
Initiating Relationships	.19 (.04)*	.59 (.05)**	-.05 (.07)	.11†	(.04 - .20)	-.16 (.07)*	.08

Exercise -Related	.31 (.08)**	.45 (.05)**	.08 (.06)	.14†	(.07 - .12)	-.06 (.08)	.11

Note: N = 311. Unstandardized b values are presented. CI = confidence interval. **K =** Preacher and Kelley's Kappa Squared effect size. Significance of pathways are denoted by * for p<.05 and ** for p<.001. Significance of the indirect path is determined by a confidence interval not containing zero and is demoted by †