Original research

Motivate me to exercise with you: The effects of social media fitness influencers on users' intentions to engage in physical activity and the role of user gender

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Abstract

Objective: Social media fitness influencers are evolving into a new digital form of health communicators whom consumers might turn to for assistance with more physical activity and exercise at home, especially in the current COVID-19 crisis. Drawing from source credibility theory, social cognitive theory, protection motivation theory and literature on physical activity, physical fitness and gender, we analyse how male and female users' evaluations of social media fitness influencers and user health-related variables impact intentions to exercise with the social media fitness influencer.

Methods: Two consecutive studies using male and female YouTube fitness influencers were carried out. Structural equation modelling was conducted to test the proposed models and estimate the path coefficients.

Results: Study 1 ($N = 507$) shows that the respective influencer's perceived trustworthiness, expertise and attractiveness are important for the influencer's evaluation, and that it is the perceived motivating power rather than the attitude toward the influencer that increases intentions to exercise for male and female users. Study 2 ($N = 445$) extends Study 1 and shows that physical fitness, training involvement with YouTube fitness videos and lower health increase behavioural intentions. A more negative body image also raises intentions to exercise, but only among female users.

Conclusion: Social media fitness influencers who are perceived as trustworthy, as experts and as attractive, can be effective for increasing men's and women's physical activity. Perceived motivating power of the influencer emerged as a key variable that predicts intentions to exercise. User health-related variables have different effects on intentions to exercise for men and women.

Keywords

Influencer, social media, physical activity, exercise, gender, health communications, quantitative

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Introduction

Social media has developed into a vital source of health information. It provides a communication channel in which users and health communicators can connect regarding various health-related aspects. One popular, health-related topic in many social media channels revolves around physical activity and fitness.[1] On YouTube, one of the most popular social media sites, users have access to videos in which social

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media fitness influencers demonstrate physical activities and try to motivate the users to mimic their workouts.

In times of globally decreasing levels of physical activity, with significantly negative implications for people's health,[2–4] it is highly important to find ways to encourage people to become more active.[5,6] Given their ability to reach a large audience, social media fitness influencers might be an important digital type of health communicator who could influence health behaviours.[7–9] This is even more apparent with COVID-19 spreading worldwide, which has provided a barrier for people's physical activity routines, as gyms or parks were closed.[10] During the pandemic, interest in online home workouts provided by digital and social media has increased,[11,12] with social media fitness influencers offering fitness workouts on their channels.[11] On YouTube, home workouts and instructional videos by social media fitness influencers are free, easy to access online, and often do not require any equipment.[11] Thus, exercising at home guided by social media fitness influencers allows individuals to maintain or improve their physical fitness in safety from home, which represents a great advantage in uncertain pandemic times.

While research interest in health and fitness communication and information on social media platforms[5,8,9,13] and on fitness apps[14–17] has increased in recent years, little is known about how social media fitness influencers impact users' health-related behaviour. Our aim is to fill this research gap. Drawing from source credibility theory, social cognitive theory, protection motivation theory (PMT) and literature on physical activity, physical fitness and gender, we carry out two studies that shed light on the question of what makes a social media fitness influencer successful from the users' perspectives. Study 1 investigates the impact of the influencers' source credibility variables (perceived trustworthiness, expertise, and attractiveness) on the attitude toward the influencer, the influencer's perceived motivating power, and, in turn, on intentions to perform the advocated fitness behaviour. Study 2 extends the research and includes important user-related health and fitness variables (self-reported health, physical fitness, body image, physical fitness involvement, and training involvement with YouTube fitness videos). Since gender influences health information behaviour in many different ways,[18] the role of users' gender is also investigated.

The research contributes to an improved understanding of how users might be motivated by social media fitness influencers to engage in physical activity. Hence, our research is relevant to users and social media fitness influencers as well as to health professionals.

Theoretical and empirical background

Social media fitness influencers as health communicators

Social media influencers are individuals who communicate information through their social media accounts to their followers. Given their large reach, successful influencers are even considered online celebrity endorsers.[19] By sharing content about their lifestyle and engaging with their followers, social media influencers can influence the attitudes and behavioural intentions of their audiences, also regarding exercise.[9,20,21] If they specialize in physical activity and fitness content, they are labelled as social media fitness influencers.

According to source credibility theory, endorsers' effectiveness in delivering messages to their target audience depends on several factors. The current research differentiates between the endorser's trustworthiness, expertise, and attractiveness as perceived by the users.[22] *Trustworthiness* describes the extent to which a respondent believes the endorser and the endorser's message[22] and has been identified as a key success factor of sources in early source credibility studies[23] and also more recently in influencer effectiveness studies.[19,24,25] *Expertise* describes the respective source's perceived competence.[22] For the acceptance of the endorser's information, it is not relevant whether the endorser is indeed an actual expert, but rather whether they are perceived as an expert.[26–28] *Attractiveness* refers to the physical appearance of the source.[27] The endorser's attractiveness is typically judged at the initial contact and influences the evaluation of the person. Considerable empirical research on the effects of celebrity and athlete endorsements has confirmed the importance of these three factors for successful communicators[26,29,30] and shown that higher levels of source trustworthiness, expertise, and attractiveness are typically beneficial for the source and lead to improved attitudes toward the source. Recently, studies have applied these source credibility constructs in social media influencer research,[19,25,31,32] albeit none of them were related to social media fitness influencers.

Since motivation plays a vital role in engaging individuals in physical activity[17] and a lack of motivation has been identified as a major reason for physical inactivity,[4] the *motivating power* attributed to the influencer is an important variable to consider. Perceived motivating power refers to how strongly users rate the influencer's capacity to encourage individuals to engage in physical activity. Hence, in the context of social media fitness influencers, we expect that trustworthiness, expertise, and attractiveness improve attitudes toward the social media fitness influencer and also increase the motivating power ascribed to the social media fitness influencer. Therefore, higher trustworthiness, expertise, and attractiveness are expected to be beneficial for the social media fitness influencer, and we hypothesize:

H1: The higher the perceived (a) trustworthiness, (b) expertise and (c) attractiveness of the social media fitness influencer, the more favourable the attitude toward the social media fitness influencer.

H2: The higher the perceived (a) trustworthiness, (b) expertise and (c) attractiveness of the social media fitness influencer, the higher the motivating power of the social media fitness influencer.

Motivation in particular has been identified as a key influence on exercise behaviours in non-social media contexts[33,34] and for fitness apps.[17] Exercise refers to planned, structured and repeated physical activities and is thus a subset of physical activity.[35] The extrinsic motivation to exercise can originate from friends and family or from role models. According to social cognitive theory, people learn by observing a model performing a certain behaviour, and the model behaviour can exert motivational influence on the individual.[36,37] By watching the behaviour's consequences, individuals memorize the model's behaviour as a behaviour option that might motivate future behaviour. Influencers can affect their followers' decision-making and elicit positive effects on intentions to follow their advice[38] and motivate certain behaviours. Hence, if a social media fitness influencer elicits favourable attitudes and users attribute high motivating power to the influencer, the users' intentions to exercise with the social media fitness influencer are expected to be higher. Thus, we propose:

H3: The more favourable the attitude toward the social media fitness influencer, the higher the intention to exercise.
H4: The greater the perceived motivating power of the social media fitness influencer, the higher the intention to exercise.

Moderating role of user gender on the effectiveness of social media fitness influencers

Gender has been determined as an important variable in the health and fitness area.[39] For instance, men are more motivated and more likely to engage in sports and are more physically active during their leisure time than women.[4,40] Women and men also differ in their motives for engaging in physical activity. While women are primarily interested in weight management or improving their health or physique,[33,41] men are more motivated to increase strength or endurance.[42] User gender might therefore moderate the proposed model relationships. To explore the role of users' gender on the hypothesized relationships (see Figure 1), we analyse the following research question:

RQ1: How does user gender moderate the hypothesized relationships?

Study 1

The purpose of Study 1 was to investigate the impact of the influencer source credibility variables (perceived trustworthiness, expertise and attractiveness) on the attitude toward the influencer and the influencer's perceived motivating power and, consequently, on the users' intentions to engage in physical activity, moderated by user gender, while controlling for influencer gender and user age (Figure 1). Study 1 employed two existing YouTube fitness video clips featuring a German-speaking male and female social media fitness influencer. Relationships were tested simultaneously with multi-group structural equation modelling.

Methods

Stimuli selection and pre-tests

*Pre-test 1.* The first pre-test aimed at identifying the fitness video's workout topic. It should be popular among users and suitable for all people. The authors created a list of popular YouTube workout topics (such as strength training, cardio, abs or legs exercises). One hundred thirty-four respondents participated in a survey (non-student online sample, $M_{age} = 28.28$ years; 55.2% female) and rated their preferred workout topics. Ab exercises emerged as the most popular exercise topic for both groups (see Table 1 for details).

Pre-test 2. The second pre-test aimed at selecting the video clips for the main study. Based on the results of Pre-test 1, the authors researched YouTube videos featuring ab exercises by popular German social media fitness influencers and selected relatively similar sets of videos for the female and male influencers. Twenty-seven undergraduate students ($M_{age} = 21.24$ years; 59.3% female) watched sets of male and female social media fitness influencers' YouTube video clips and discussed each influencer's trustworthiness, expertise and attractiveness afterward. The final sets of the influencers' videos showed similar ab workouts, and both influencers were perceived as trustworthy, experts and attractive. Both videos were cut to have the same length (47 s).

Pre-test 3. The third pre-test examined the suitability of the two videos (male version, female version) and the comprehensibility of the questionnaire. Twenty-five undergraduate students participated in the third pre-test ($M_{age} = 22.56$ years; 72% female). Participants evaluated the two videos as suitable and reported no difficulties in answering the questionnaire.

Participants

Main Study 1 was a survey study where only de-identified data was collected for which ethical approval is not required under European law. It was a study with human subjects that presents no greater than minimal risk to subjects. Before completing the questionnaire, the subjects were assured in written form of anonymous data collection (i.e. no identifiers can be connected to the data, either directly or through a coding system), of the entirely voluntary nature of participation and of the possibility of terminating the study
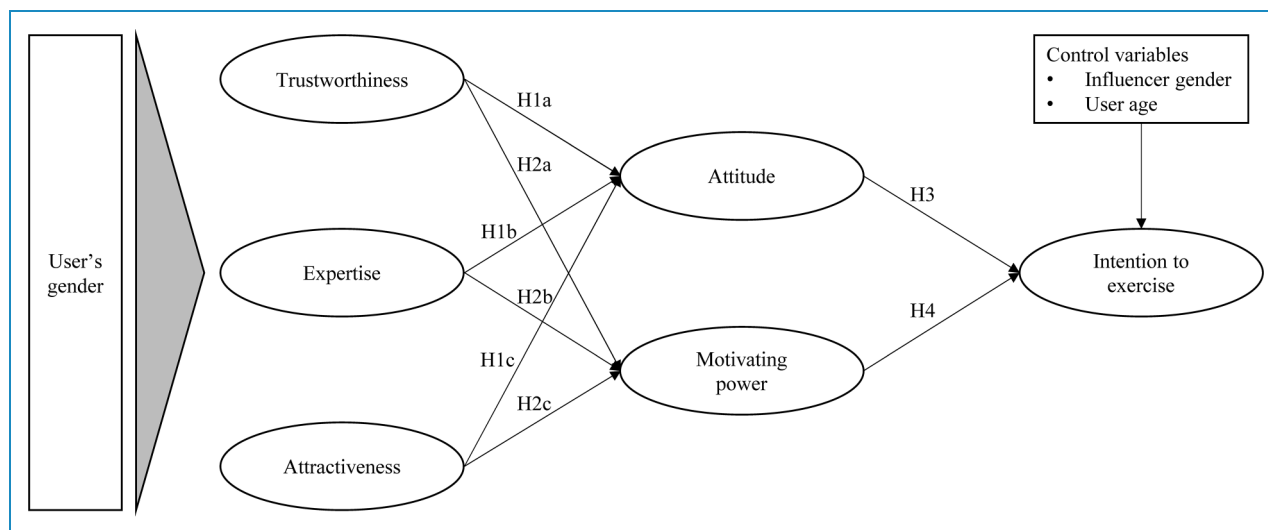
Figure 1. Conceptual social media fitness influencer model.

Table 1. Pre-Test 1: variables with means and standard deviations per group.

Fitness video topics	Women		Men		Total sample	
	M	SD	M	SD	M	SD
Ab workout	3.82	2.154	3.70	2.374	3.77	2.248
Strength training	3.58	2.215	3.66	2.418	3.47	2.454
Legs workout	3.31	2.488	3.58	2.486	3.45	2.213
Cardio workout	3.24	2.172	3.47	2.205	3.39	2.264
Fitness tips	3.22	2.064	3.45	2.158	3.33	2.160
Fitness motivation	3.11	2.117	3.28	2.218	3.26	2.152
Upper body workout	3.08	2.107	3.13	2.213	3.12	2.152
Yoga	2.82	2.091	2.35	2.073	2.61	2.088
Dancing, aerobics, zumba	2.79	2.398	2.25	1.954	2.55	2.217

at any time without consequences. The study meets the criteria of the European General Data Protection Regulation (GDPR).

Study 1 had a non-student sample with 507 participants ($M_{age} = 30.75$, from 18–68 years; 50.7% female). Data was collected in the German-speaking area with a structured online questionnaire. Participants were recruited by distributing the questionnaire online via the snowball principle and through the online consumer panel ClickWorker (similar to MTurk in

the USA). This sampling procedure has been successfully applied by previous research.[43] Respondents received a small compensation (1 EURO) for participating in the survey.

Procedure

The study had a cross-sectional, quasi-experimental 2 (male/female influencer) × 2 (male/female user) between-subject design. Participants were randomly assigned to one of the two fitness video clips (either version). They watched the video clip and then answered questions about the clip. Sociodemographic data on gender, age and nationality were collected at the end of the questionnaire.

Measures

Items were derived from existing multi-item scales when available and adapted to the research context. Table 2 reports the scale references, the items for all variables, their means, standard deviations, Cronbach α values for multi-item measures and Spearman-Brown coefficients for two-item measures.[44] Factor analyses were performed to investigate the one-dimensionality of the multi-item scales. Reliability analyses were conducted for all variables. Perceived *trustworthiness, expertise* and *attractiveness* were each measured with three items from the celebrity endorsement scale by Ohanian.[22] The scales achieved good reliability (trustworthiness: $\alpha = 0.930$; expertise $\alpha = 0.949$; attractiveness $\alpha = 0.946$). The *motivating power* ascribed to the influencer was assessed with the item "The influencer is motivating" (M = 4.03; SD = 1.625), adapted from Döring.[7] *Attitude towards the influencer* was measured with two items adapted from Pollay and Mittal.[45] (Spearman-Brown coefficient = 0.916) Two

Table 2. Study 1: variables with means and standard deviations per group.

Variables and items	Women		Men		Total sample	
	M	SD	M	SD	M	SD
Trustworthiness[a] ($\alpha = 0.930$)	4.58	1.464	4.52	1.428	4.55	1.446

The influencer is ...
    trustworthy
    sincere
    reliable						

Expertise[a] ($\alpha = 0.949$)	4.61	1.521	4.47	1.415	4.54	1.470

The influencer is ...
    experienced
    qualified
    skilled						

Attractiveness[a] ($\alpha = 0.946$)	3.88	1.618	3.99	1.703	3.93	1.660

The influencer is ...
    beautiful
    attractive
    sexy						

Motivating power[b]	4.08	1.645	3.97	1.607	4.03	1.625
The influencer is motivating.						
Attitude toward the influencer[c] (Spearman-Brown coefficient = 0.916)	4.47	1.468	4.51	1.430	4.49	1.448

The influencer is ...
    good
    positive						

Intention to exercise[d] (Spearman-Brown coefficient = 0.953)	2.45	1.750	2.31	1.690	2.38	1.720
I intend to exercise with this YouTube fitness video within the next month. It is very likely that I will exercise with this YouTube fitness video within the next month.						

Note. All items were measured on a 7-point Likert scale from 1 ("do not agree at all") to 7 ("totally agree").
[a]Based on Ohanian.[22]
[b]Adapted from Döring.[7]
[c]Adapted from Pollay and Mittal.[45]
[d]Adapted from Ajzen.[46]

items adapted from Ajzen[46] assessed *intention to exercise* (Spearman-Brown coefficient = 0.953).

Measurement model

Prior to testing the structural equation model (SEM), we conducted a confirmatory factor analysis (CFA) to assess the measurement model for the whole data set using IBM SPSS AMOS 25. Results yielded an acceptable overall model fit (x^2/df = 2.537, TLI = 0.977 CFI = 0.985, RMSEA = 0.055)

and acceptable local fit measures.[47] Table 3 reports the average variance extracted (AVE), composite reliability and indicator reliability for all constructs and the test for discriminant validity,[48] which was supported as well.

SEM results

The multi-group SEM resulted in an acceptable model fit (x^2/df = 2.091, CFI = 0.977, TLI = 0.968, RMSEA = 0.046) and was valid for female and male respondents.

Table 3. Study 1: reliability and validity measures for variables (CFA), discriminant validity and squared construct correlations.

Construct	Indicator reliability	Composite reliability	AVE	Highest squared construct correlation
1 Trustworthiness	0.810–0.858	0.941	0.841	0.728
2 Expertise	0.858–0.911	0.957	0.882	0.596
3 Attractiveness	0.835–0.914	0.955	0.877	0.341
4 Attitude	0.814–0.877	0.916	0.845	0.494
5 Motivating power	-	-	-	-
6 Intention to exercise	0.898–0.923	0.953	0.910	0.321

Note. AVE: average variance extracted; -: not applicable.

Trustworthiness had the strongest impact on attitude toward the social media fitness influencer for men and women ($\gamma_{women} = 0.457$, $p < 0.01$; $\gamma_{men} = 0.485$, $p < 0.01$). Expertise ($\gamma_{women} = 0.261$, $p < 0.05$; $\gamma_{men} = 0.265$, $p < 0.05$) and attractiveness ($\gamma_{women} = 0.270$, $p < 0.01$; $\gamma_{men} = 0.226$, $p < 0.01$) also yielded significant influence on the attitude toward the influencer for both groups. The results confirmed H1a-c. Trustworthiness was also the strongest predictor of motivating power for women ($\gamma_{women} = 0.379$, $p < 0.01$; $\gamma_{men} = 0.209$, $p < 0.05$), while the influencers' expertise ($\gamma_{women} = 0.194$, $p < 0.05$; $\gamma_{men} = 0.413$, $p < 0.01$) was the strongest predictor of motivating power for men. Attractiveness also influenced motivating power significantly for both genders ($\gamma_{women} = 0.294$, $p < 0.01$; $\gamma_{men} = 0.270$, $p < 0.01$). H2a-c was also confirmed by the data.

Interestingly, attitude toward the influencer had no effect on the participants' intentions to perform physical activity ($\gamma_{women} = 0.078$, not significant (n.s.); $\gamma_{men} = 0.023$, n.s.), disproving H3, while motivating power led to higher intentions to perform physical activity for both genders ($\gamma_{women} = 0.541$, $p < 0.01$; $\gamma_{men} = 0.518$, $p < 0.01$), confirming H4. Regarding the control variables, the influencer's gender had no significant effect on behavioural intentions, either for male or female users ($\gamma_{women} = -0.008$, n.s.; $\gamma_{men} = -0.007$, n.s.). User age had a significant positive effect on intentions to exercise for men ($\gamma_{men} = 0.129$, $p < 0.05$), but no significant effect for women ($\gamma_{women} = -0.016$, n.s.).

We conducted pairwise comparisons to test for significant differences between female and male users in the model relationships. The impact of expertise on motivating power was slightly stronger among males than females at the 10% level. The path from user age to intention to exercise differed on the 10% level as well (z-value $> |1.65|$). Overall, the model and its relationships were very similar for both genders. Table 4 displays the path coefficients, significance, and pairwise comparison results.

Discussion of study 1

The results of Study 1 imply that social media fitness influencers' trustworthiness is more important for users' attitude toward the influencer than social media fitness influencers' expertise and attractiveness. With regard to perceived motivating power, trustworthiness is the most relevant variable for women. Among men, expertise is more important than the other source credibility variables. Attractiveness is less important for both genders. Another important result of Study 1 is that the attitude toward the influencer is largely irrelevant for users' intentions to exercise, while the motivating power attributed to the influencer is the key to positively influencing users' intentions to exercise for both groups.

Impact of user health and fitness variables on the intention to engage in physical activity

Study 1 explored the roles that social media fitness influencers' trustworthiness, expertise and attractiveness play in female and male users' intentions to follow the advocated physical activity and investigated whether the users' gender matters. In the following, we extend the model with the important health and fitness variables: self-reported health, physical fitness, body image, physical fitness involvement and training involvement with YouTube fitness videos. We expect that these variables might impact users' intentions to engage in the advocated physical activity. We are again interested in the question of whether the user's gender moderates the model relationships. Figure 2 displays the final conceptual social media fitness influencer model. The variables and relationships will be elaborated in the following paragraphs.

A variable that is likely to play a role in users' intentions to exercise with a social media fitness influencer is users' *health status*.[49] While a person's health status is undoubtedly complex and multi-faceted,[50,51] individuals typically

Table 4. Study 1: SEM results.

Path	H	Path coefficient		C.R.
		Women	Men	
Trustworthiness → Attitude	H1a	0.457***	0.485***	0.214
Expertise → Attitude	H1b	0.261**	0.265**	0.252
Attractiveness → Attitude	H1c	0.270***	0.226***	−0.655
Trustworthiness → Motivating power	H2a	0.379***	0.209**	−1.352
Expertise → Motivating power	H2b	0.194**	0.413***	1.888*
Attractiveness → Motivating power	H2c	0.294***	0.270***	−0.426
Attitude → Intention to exercise	H3	0.078	0.023	−0.501
Motivating power → Intention to exercise	H4	0.541***	0.518***	−0.295
Influencer gender → Intention to exercise		−0.008	−0.007	0.012
User age → Intention to exercise		−0.016	0.129**	1.828*
	x^2/df	RMSEA	CFI	TLI
Structural model Study 1	2.091	0.046	0.977	0.968

Note. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

judge their perceived health as a single assessment (e.g. "good" or "poor"), that is, instead of evaluating different facets of their health separately, individuals often assess their overall health status. This summary assessment is referred to as self-reported health and is commonly used to measure one's perceived health status.[52,53] In a social media fitness influencer setting, we expect lower self-reported health to lead to increased intentions to perform physical activity with the social media fitness influencer's video. We draw our rationale from PMT[54] which is a major health psychology theory that aims at gaining a better understanding of the cognitive processes inherent to adopting health-related behaviours, for example physical activity. PMT suggests that when individuals perceive a threat, they appraise possible coping mechanisms that help them to remove the threat.[54–56] We assume that individuals likely perceive a low health status as threatening and therefore try to engage in coping mechanisms. One way to cope is by engaging in physical activity that contributes positively to one's health[55] and can easily be carried out. Two reviews[55,56] and several empirical studies in different contexts on PMT and physical activity[57,58] suggest that the PMT can predict health-related behaviours. Emulating exercises performed by social media fitness influencers promises relatively easy improvements of one's health status.

Social media fitness influencers usually demonstrate exercise behaviours that are not too difficult to carry out and exercises can be performed at home; hence, they are fairly easy to realize. Thus, we hypothesize:

H5: The lower the individual's self-reported health, the higher the intention to exercise.

Physical fitness can be considered as a set of attributes that are either health- or skill-related and that people have or achieve.[35] Health-related components of physical fitness include cardiorespiratory endurance, muscular endurance, muscular strength, body composition and flexibility, while skill-related attributes include agility, balance, coordination, power, speed and reaction time, which can be assessed by physical tests.[35,59] Usually, the health-related components are the focus of empirical studies on fitness.[35,59]

We also focus on the health-related components and follow the notion that physical fitness is a state of well-being with low risk of premature health problems and the ability to participate in a variety of physical activities,[59,60] which is a desirable state for individuals. Physical fitness can be achieved through (sustained) physical activity. Ortega et al.[61] showed that individuals' self-reported

overall fitness was strongly associated with their actual overall fitness (as measured by objective laboratory tests). We focus on the perceived overall fitness of individuals. It is also an individual characteristic that can influence exercise intentions.[62] Lower perceived physical fitness probably leads to higher intentions to exercise with the fitness influencers in order to improve one's own physical fitness, similar to the effect of the health status on the intention to exercise. Following the PMT, individuals may again perceive their low physical fitness as a threat to their overall health and again develop intentions for counteractive behaviours, such as the intention to exercise to reduce such threats.

Social media fitness influencers promise a relatively convenient way to improve one's physical fitness by emulating the influencer's workout from home, which might be particularly attractive to individuals with lower fitness capabilities, because they can exercise at their own pace without being observed by others. We hypothesize:

H6: The lower the individual's physical fitness, the higher the intention to exercise.

Body image is a multidimensional construct that refers to perceptions, feelings, thoughts and behaviours about one's body and can range from positive to negative.[63] Body image mirrors how satisfied or dissatisfied a person feels about their shape and weight. Exercise has been shown to improve body image.[64] In fitness-related image-based social media, the ideal female body is typically portrayed as thin, fit and athletic,[65,66] while the ideal male body is presented as muscular, toned and lean.[67] Social media fitness influencers with such an ideal body are likely to influence body-related perceptions and behaviours, such as physical activity, with potential positive and negative outcomes.[37,66] Negative outcomes of social media use in relation to body image (e.g. body image concerns, body dissatisfaction, disordered eating) have been investigated by a large body of research.[66,68,69] However, exercise might have positive effects on one's body image as well,[64] since individuals might develop positive expectations in relation to their health (e.g. getting fit, having a well-trained healthy body), particularly if the goal seems achievable,[21] which, in turn, encourages an engagement in physical activity and exercise. Hence, lower body image might increase exercise intentions with the social media fitness influencer. Influencers are often considered as peers and their positive fitness results might seem achievable and motivating,[21,70] because individuals are likely to expect an improvement of their bodies' appearance in relation to their health through exercise. Therefore, we assume – similar to the proposed effects of health status and physical fitness on intention to exercise – that a lower body image increases exercise intentions, since social media fitness influencers encourage

users to exercise and create a positive body image by developing a healthy and fit body. We postulate:

H7: The lower the individual's body image, the higher the intention to exercise.

Involvement is a central construct for predicting and understanding behaviour.[71] Physical fitness involvement refers to a person's general concern about and interest in physical fitness and how important achieving physical fitness is to the individual.[72,73] As stated previously, physical fitness is considered a desired health outcome of physical activity.[35,62] Physical fitness involvement has been shown to successfully predict exercise and leisure behaviours.[73,74] For instance, individuals with higher physical fitness involvement were found to be more likely to engage in related behaviours, such as physical activity.[72,75] An elevated physical fitness involvement can be seen as a prerequisite for exercise intention, as it indicates a general interest in sport exercises. We hypothesize:

H8: The higher the individual's physical fitness involvement, the higher the intention to exercise.

In the context of YouTube fitness videos, *training involvement with YouTube fitness videos* – a more specific form of physical fitness involvement – might influence intentions to exercise as well. If YouTube fitness video training plays a significant role in an individual's life, this involvement might then positively influence the user's intention to perform a fitness workout.[62] Thus, we hypothesize:

H9: The higher the individual's training involvement with YouTube fitness videos, the higher the intention to exercise.

Study 2

The purpose of Study 2 was to test the extended model relationships. As in Study 1, relationships were tested simultaneously with multi-group SEM. Study 2 used different videos, but the same influencers as in Study 1, and again featured ab exercises. Two pre-tests were conducted to select the stimuli.

Methods

Stimuli selection and pre-test

Pre-Test 1. The first pre-test was a guided interview with the aim of selecting a different set of video clips featuring the same influencers as in Study 1. The authors researched YouTube fitness videos with a focus on abs from the two social media fitness influencers. Eleven subjects ($M_{age} =$ 24.18 years) watched 3×2 (male vs female) YouTube social media fitness influencer video clips performing the
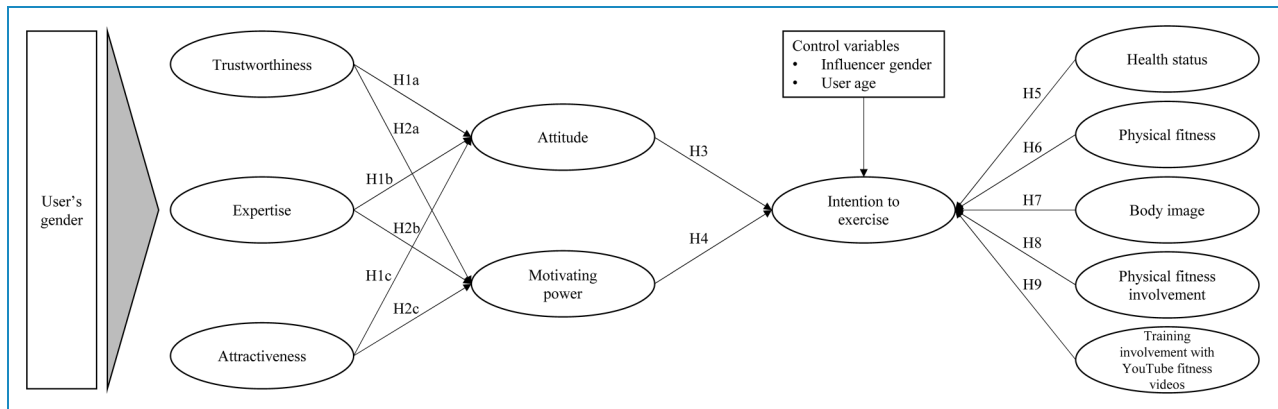
Figure 2. Extended conceptual social media fitness influencer model.

same ab exercise. Then, they evaluated their attitude toward the influencers with a paper-and-pencil questionnaire. Afterwards, influencers' trustworthiness, expertise, attractiveness and motivation were discussed in the group. The final two videos (male version, female version) had the most favourable and similar results. They were cut to the same length of 22 s.

Pre-Test 2. The second pre-test (student sample, $N = 25$, $M_{age} = 20.92$ years) aimed at confirming the suitability of the stimuli and the comprehensibility of the online questionnaire. Participants reported no difficulties in answering the questionnaire and evaluated the clips as suitable.

Participants

Consistent with Study 1, Study 2 presented no greater than minimal risk to subjects and participants were assured in written form of anonymous data collection, of the entirely voluntary nature of participation and of the option to end the study at any time without consequences. Again, the criteria of the European GDPR were met.

Study 2 had a non-student sample with 445 participants ($M_{age} = 29.6$, from 16–63 years; 55.3% female). Data was collected with a structured online questionnaire in the German-speaking area. As in Study 1, participants were recruited online via the snowball principle and through the online consumer panel ClickWorker. Again, respondents received a small compensation (1 EURO) for their participation.

Procedure

The study had a cross-sectional, quasi-experimental 2 (male/female influencer) × 2 (male/female user) within-subject design. Each participant randomly watched one fitness video clip (the female or male version first), answered questions about it, then watched the other video clip and completed questions about it. Respondents

reported sociodemographic data (gender, age, nationality) at the end of the questionnaire.

Measures

Study 2 included the same constructs as Study 1 (trustworthiness, expertise, attractiveness, attitude towards the influencer, motivating power, behavioural intention, age and gender) and the additional health and fitness variables. As in Study 1, items were measured on a 7-point-Likert scale from 1 ("do not agree at all") to 7 ("totally agree"). Factor analyses were conducted to ensure the one-dimensionality of the multi-item scales. Reliability analyses were performed for all variables. All scales had acceptable Cronbach-Alpha values and Spearman-Brown coefficients, respectively. Items, mean values, standard deviations and reliability values of Study 2 are displayed in Table 5.

Study 1 identified motivating power as a key variable that predicts intentions to exercise, measured with one item. In Study 2, the authors decided to measure motivating power with three items for a more solid measurement ($\alpha = 0.899$). *Self-reported health* was measured with one item adapted from Stokols et al.[76] Subjects were asked for their level of agreement to the statement "My overall health is good" (M = 5.48, SD = 1.372). *Physical fitness* was measured with two items adapted from the German version of the International Fitness Scale.[61] (Spearman-Brown coefficient = 0.895) *Body image* was measured with two items from the Body Appreciation Scale.[63] (Spearman-Brown coefficient = 0.911) *Physical fitness involvement* (Spearman-Brown coefficient = 0.954) and *training involvement with YouTube fitness videos* (Spearman-Brown coefficient = 0.944) were each measured with two items adapted from Zaichkowsky.[71]

Measurement model

In order to assess the measurement model, we carried out a CFA using IBM SPSS AMOS 25. Results yielded an

Table 5. Study 2: variables with means and standard deviations per group.

Variables and items	Women		Men		Total sample	
	M	SD	M	SD	M	SD
Trustworthiness[a] ($\alpha = 0.938$)	4.52	1.457	4.30	1.510	4.42	1.485

The influencer is ...
   trustworthy
   sincere
   reliable						

Expertise[a] ($\alpha = 0.953$)	4.46	1.518	4.25	1.533	4.37	1.528

The influencer is ...
   experienced
   qualified
   skilled						

Attractiveness[a] ($\alpha = 0.936$)	3.54	1.601	3.74	1.695	3.63	1.646

The influencer is ...
   beautiful
   attractive
   sexy						

Motivating power[b] ($\alpha = 0.899$)	3.73	1.556	3.56	1.488	3.65	1.527

The influencer ...
   is motivating
   encourages to keep going
   encourages to carry on						

Attitude toward the influencer[c] (Spearman-Brown coefficient = 0.940)	4.55	1.549	4.31	1.614	4.44	1.582

The influencer is ...
   good
   positive						

Intention to exercise[d] (Spearman-Brown coefficient = 0.956)	2.15	1.480	2.24	1.684	2.19	1.574
I intend to exercise with this YouTube fitness video within the next month. It is very likely that I will exercise with this YouTube fitness video within the next month.						
Self-reported health[e]	5.37	1.406	5.61	1.319	5.48	1.372
My overall health is good.						
Physical fitness[f] (Spearman-Brown coefficient = 0.895)	4.47	1.338	5.11	1.374	4.75	1.390
My general physical fitness is ...						
My satisfaction with my general physical fitness is ...						

(continued)

Table 5. Continued.

Variables and items	Women		Men		Total sample	
	M	SD	M	SD	M	SD
Body image[g] (Spearman-Brown coefficient = 0.911)	5.05	1.484	5.63	1.242	5.31	1.410
I have a positive attitude toward my body.						
My feelings toward my body are positive, for the most part.						
Physical fitness involvement[h] (Spearman-Brown coefficient = 0.954)	5.47	1.503	5.63	1.365	5.54	1.444
I am interested in physical fitness.						
Physical fitness is important to me.						
Training involvement with YouTube fitness videos[h] (Spearman-Brown coefficient = 0.944)	2.79	1.696	2.61	1.751	2.71	1.722
I am interested in doing my physical fitness training with YouTube fitness videos.						
Doing my physical fitness training with YouTube fitness videos is important to me.						

Note. All items were measured on a 7-point Likert scale from 1 ("do not agree at all") to 7 ("totally agree").
[a]Based on Ohanian.[22]
[b]Adapted from Döring[7] and extended.
[c]Adapted from Pollay and Mittal.[45]
[d]Adapted from Ajzen.[46]
[e]Adapted from Stokols, Shumaker and Martinez.[76]
[f]Adapted from the German version of the International Fitness Scale (IFIS).[61]
[g]Adapted from Avalos et al.[63]
[h]Adapted from Zaichkowsky.[71]

acceptable model fit.[47] (x^2/df = 3.807, CFI = 0.970, TLI = 0.957, RMSEA = 0.056). The local fit measures AVE, indicator reliability, composite reliability and discriminant validity fulfilled the psychometric requirements (see Table 6).

SEM results

The hypotheses were tested simultaneously with multigroup SEM. We analysed the conceptual model with the extended measurement of motivating power and the control variables influencer gender and user age (Figure 2). Again, two groups were analysed (male vs female respondents) to investigate the moderating effects of user gender. The results of the multi-group SEM yielded an acceptable model fit (x^2/df = 2.222, CFI = 0.969, TLI = 0.963, RMSEA = 0.037).

Trustworthiness, expertise and attractiveness had significant effects on attitude toward the influencer and motivating power, which subsequently had significant positive impacts on intentions to exercise for men and women. As in Study 1, H1a-c and H2a-c were confirmed. Trustworthiness had

the strongest effect on attitude toward the influencer for both groups (γ_{women} = 0.577, $p < 0.01$; γ_{men} = 0.656, $p < 0.01$). Expertise had the strongest influence on motivating power for women (γ_{women} = 0.347, $p < 0.01$), while trustworthiness had the highest impact on motivating power for men (γ_{men} = 0.428, $p < 0.01$). Attitude toward the influencer had significant positive effects on intentions to exercise for women (γ_{women} = 0.198, $p < 0.01$), but not for men (γ_{men} = 0.063, n.s.), leading to partial support for H3. Motivating power (γ_{women} = 0.271, $p < 0.01$; γ_{men} = 0.431, $p < 0.01$) yielded significant positive effects on intentions to exercise for both genders, confirming H4. Self-reported health had a significant negative effect on behavioural intentions for men and women (for women only at a 10% level) (γ_{women} = −0.094, $p < 0.10$; γ_{men} = −0.190, $p < 0.05$), confirming H5. Physical fitness yielded a significant positive effect on intentions to exercise for both groups (γ_{women} = 0.137, $p < 0.05$; γ_{men} = 0.217, $p < 0.05$), rejecting H6. Body image had a significant negative effect on intentions to exercise for women, but not for men (γ_{women} = −0.180, $p < 0.05$; γ_{men} = −0.068, n.s.). Thus, H7 was

Table 6. Study 2: reliability and validity measures for variables (CFA), discriminant validity and squared construct correlations.

Construct	Indicator reliability	Composite reliability	AVE	Highest squared construct correlation
1 Trustworthiness	0.843–0.869	0.946	0.854	0.723
2 Expertise	0.847–0.916	0.960	0.888	0.605
3 Attractiveness	0.807–0.886	0.946	0.855	0.321
4 Attitude	0.867–0.906	0.939	0.886	0.416
5 Motivating power	0.534–0.911	0.911	0.775	0.257
6 Intention to exercise	0.898–0.932	0.956	0.916	0.262
7 Self-reported health	-	-	-	-
8 Physical fitness	0.717–0.913	0.890	0.802	0.469
9 Body image	0.730–0.960	0.919	0.850	0.404
10 Physical fitness involvement	0.880–0.944	0.954	0.912	0.052
11 YT fitness training involvement	0.884–0.905	0.944	0.894	0.043

Note. AVE: average variance extracted; -: not applicable.

confirmed for women, but not for men. Involvement with physical fitness had a significant, yet negative, effect on intentions to exercise for women ($\gamma_{women} = -0.089$, $p < 0.05$), but suggested no significant effect for men ($\gamma_{men} = 0.055$, n.s.), rejecting H8 for both groups. Training involvement with YouTube fitness videos positively influenced intentions to exercise for male and female users ($\gamma_{women} = 0.431$, $p < 0.01$; $\gamma_{men} = 0.426$, $p < 0.01$), confirming H9. The control variable, influencer gender, again had no significant effect on the behavioural intentions of women and men ($\gamma_{women} = -0.056$, n.s.; $\gamma_{men} = 0.006$, n.s.). User age had a significant negative effect on intentions to exercise for women but had no significant effect for men ($\gamma_{women} = -0.079$, $p < 0.05$; $\gamma_{men} = 0.007$, n.s.).

We conducted pairwise comparisons to test for significant differences between the path coefficients of male and female users. The paths from trustworthiness, expertise and attractiveness to motivating power; from motivating power to intentions to exercise; and from physical fitness involvement to intentions to exercise implied significant group differences (z-value >|1.96|). The path from attitude to intention to exercise differed on a 10% level (z-value >|1.65|). Table 7 exhibits the path coefficients, significances and critical ratios.

Discussion and implications

This research aimed to examine whether and how social media fitness influencers can be successful health

communicators and which factors lead to higher intentions of users to engage in physical activity. We analysed how the social media fitness influencer's trustworthiness, expertise and attractiveness influence the attitude toward the influencer and the motivating power that users ascribe to the influencer, how these variables, in turn, influence users' intentions to exercise, and whether users' gender affects these relationships. Furthermore, five user-related health and fitness variables were included in the analysis. Our findings from two empirical studies contribute to our understanding of how users evaluate social media fitness influencers, what makes a social media fitness influencer successful from the users' perspective, and which variables lead to encouraging respondents' intention to engage in (more) physical activity. Therefore, this study extends research on source credibility to the context of social media fitness influencers. The findings of the two studies show that trustworthiness, expertise and attractiveness help to understand how social media fitness influencers might contribute to motivating users to engage in physical activity. Social media fitness influencers have established themselves as influential in the health and fitness scene.[9,21] Extending previous research findings on source credibility of social media influencers,[19,25,31,32] this research confirms the high relevance of these three factors especially for social media fitness influencers.

Trustworthy, expert and attractive influencers might be effective health communicators in the digital world and might contribute to increasing physical activity[2,3] by

Table 7. Study 2: SEM results.

Path	H	Women	Men	C.R.
Trustworthiness → Attitude	H1a	0.577***	0.656***	0.863
Expertise → Attitude	H1b	0.187***	0.163**	−0.175
Attractiveness → Attitude	H1c	0.199***	0.169***	−1.134
Trustworthiness → Motivating power	H2a	0.180***	0.428***	2.364***
Expertise → Motivating power	H2b	0.347***	0.223***	−2.441***
Attractiveness → Motivating power	H2c	0.163***	0.105***	−2.713***
Attitude → Intention to exercise	H3	0.198***	0.063	−1.695*
Motivating power → Intention to exercise	H4	0.271***	0.431***	3.139***
Self-reported health → Intention to exercise	H5	−0.094*	−0.190**	−1.389
Physical fitness → Intention to exercise	H6	0.137**	0.217**	0.739
Body image → Intention to exercise	H7	−0.180**	−0.068	1.148
Physical fitness involvement → Intention to exercise	H8	−0.089**	0.055	2.354***
Training involvement with YouTube fitness videos → Intention to exercise	H9	0.431***	0.426***	−0.258
Influencer gender → Intention to exercise		−0.056	0.006	1.226
User age → Intention to exercise		−0.079**	0.007	1.107
	x^2/df	RMSEA	CFI	TLI
Structural model	2.222	0.037	0.969	0.963

Note. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.

motivating people to exercise at home. This research further highlights the positive effects that social media[8,77] and social media fitness influencers might have on users.[9,21] Increasing physical exercise and thus contributing to individuals' health via digital and social media seems especially important when gyms and fitness clubs are subject to access restrictions, as in the COVID-19 pandemic.[10,11]

Among the source credibility variables, the influencers' trustworthiness appeared to be particularly important for all participants in relation to attitude formation toward the social media fitness influencers in both studies. This finding corroborates previous research that identified trustworthiness as a central influencer characteristic.[19,25] Notably, in both studies, the influencers' motivating power had a stronger impact on the intention to exercise than the attitude toward the influencer in both studies,

indicating that perceived motivating power is a key variable for intentions to exercise for men and women. Following social cognitive theory,[36] users' observations of the influencer's exercise behaviour might indeed increase motivation to work out, when the influencer's behaviour is evaluated as a promising behavioural option. A favourable attitude toward the influencer played a less important role.

While perceived motivating power emerged as a key variable for exercise intentions, several health and fitness variables showed effects on exercise intentions as well. Users' lower self-reported health indicated higher intentions to exercise. Apparently, in line with the PMT,[55,56] if subjects consider their health to be rather poor and perceive the risk of possible diseases as a threat to their own health, they seem to be more inclined to engage in appropriate coping behaviours, that is, physical activity, with the goal

of improving their health. Therefore, individuals appear to be aware of the fact that engaging in regular physical activity is beneficial for their health.[78]

Contrary to what was predicted, physical fitness positively affected users' intentions to exercise. It seems that a certain level of physical fitness is regarded as a prerequisite for intention to exercise. Thus, a more positive evaluation of one's own physical fitness is likely to positively affect intentions to exercise with a fitness video. By positively addressing users' physical fitness, for instance, by complimenting the level of physical fitness already achieved as an outcome of regular physical activity, social media fitness influencers might actually be able to increase users' motivation to exercise. If users then perceive their own fitness as higher, they are probably more motivated to continue exercising.

Body image exerted a significant negative influence on the motivation to exercise for female users, but not for male users; that is, a lower body image among women indicated higher intentions to exercise. Previous research has suggested that exposure to fit and thin fitness models might have both positive and negative health effects.[79,80] Negative effects can, for instance, result from comparisons with well-trained models that lead to dissatisfaction with one's own appearance. Positive effects can result when the models inspire individuals to pursue healthy lifestyle behaviours by imitating the models.[66] In our study, women with lower body image reported increased intentions to exercise after viewing the fitness influencer's video. Thus, while watching the influencer and the exercise, positive expectations in relation to their own body shape might have arisen. Apaolaza-Ibáñez et al.[81] were able to demonstrate for cosmetics that women gain a positive feeling from using cosmetics, as they do everything they can for their appearance, and thus experience a feeling of relief from dissatisfaction with their physical appearance. This might also hold true for physical activity and one's own body image. By exercising with the influencer, women might experience less dissatisfaction with their body image. This effect certainly warrants additional research. For men, body image seems to be less relevant for working out with a fitness video, pointing in the same direction as prior research that indicates that men tend to pay less attention to social norms about their physical appearance than women.[80]

Interestingly, physical fitness involvement had no effect among male users and a negative effect among female users on their exercise intentions. While previous research in other contexts found positive effects of physical fitness involvement on exercise intentions,[73,75] our results indicate that physical fitness involvement does not predict motivations to work out with social media fitness influencers. Possibly, physical fitness involvement is too general to predict higher and more positive intentions to exercise with a YouTube fitness influencer. It might be that users

see other physical activities as better suited to achieve their physical fitness goals. Training involvement with YouTube fitness videos, a more specific measurement of involvement, yielded the expected positive results for both groups. Men and women who are involved in social media fitness influencer YouTube training sessions and consider such fitness videos to be important for their lifestyle indicated higher intentions to conduct their workouts with such videos.

In summary, our research suggests that social media fitness influencers who are evaluated as trustworthy, as experts, as attractive, and as having a high perceived motivating power might indeed be effective for increasing people's intention to engage in physical activity (i.e. exercising at home with social media fitness influencers) and thus might improve the physical condition and health of users via digital media. The motivating power of the influencer emerged as a central variable for predicting intentions to exercise, rather than the attitude towards the influencer. Physical fitness, (lower) health status, and training involvement with YouTube fitness videos were found to be important for men's and women's exercise intentions. Body image and physical fitness involvement had different effects on intentions to exercise reported by both groups.

Limitations and directions for future research

Beyond our study's important contributions, there are some limitations. One limitation of this research is that we employed German-speaking influencers in both studies. Future research might benefit from examining the developed social media fitness influencer model in an international context, for instance, in other countries with other social media fitness influencers. Additionally, our study analysed one fitness activity for one specific body area. Future research might want to examine other fitness activities and different body areas. Investigating gender differences in relation to other workouts could provide new discoveries.

This research identified perceived motivating power as a central influencing factor on intentions to exercise and analysed the influence of five important health and fitness variables on behavioural intentions. Beyond the source credibility variables trustworthiness, expertise and attractiveness, that we applied in our study, there might be additional source variables that have an influence on respondents' attitude formations and the social media fitness influencers' perceived motivating power. Apart from attitude and motivating power, there might be further variables that could influence users' behavioural intentions.

As some of our results showed gender-related differences, it might be interesting to explore the reasons for these differences in more detail.

We focused on how social media fitness influencers might increase users' intentions to become physically active. Future research might examine actual physical activity planning and behaviour[10,82,83] with social media fitness influencers' video content. Future research should also elaborate on the causal relationship between the variables and whether the successful achievement of regular physical activity is also important to increase or maintain an individual's intention to exercise. We measured the overall fitness perception. Though Ortega et al.[61] showed that the overall self-reported fitness is a good indicator for the actual physical fitness measured through objective laboratory tests, future studies might want to use objective tests for measurement and might also analyse different forms of physical fitness such as cardiorespiratory fitness, muscular strength, speed, agility and flexibility.[35,61] Future research may also apply methods such as experiments and conduct longitudinal studies.

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