Think before you grunt: the social repercussions of grunting in the gym

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PSB3E-BT15: Bachelor Thesis

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February 21, 2022

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Abstract

Grunting refers to making a low, inarticulate sound to express one's effort and is common place in sports such as tennis, as well as in the gym. Grunting has been found to be useful as a means to enhance sport performance. However, recent research has indicated that grunting in gyms is a voluntary action, emerging from social interactions. Thus, there is more to grunting than its practical use; it is a social phenomenon. Current research is the first experimental study to explore the effect of grunting on social perceptions. We tested the effect of grunting on perceived masculinity and perceptions of various physical characteristics. Based on the fact that grunting in the gym has been associated with stereotypically masculine traits, we propose that grunting has a positive effect on masculinity. Additionally, we propose that grunting has a positive effect on perceived exertion, perceived fitness and attractiveness. To assess whether the supposed positive effect of grunting on masculinity perceptions extends to homosexual men as well (considering they are generally perceived as less masculine than heterosexual men), we included sexual orientation as an additional independent variable. We conducted a 2x2 between-subjects study ($N = 335$), manipulating sexual orientation (heterosexual vs homosexual) and grunting (grunting vs no grunting). Results indicate a negative effect of grunting on perceived masculinity, perceived fitness and attractiveness and a positive effect on exertion – implying that grunting does in fact influence social perceptions. Gender of the perceiver seems to be a moderator in the effect of grunting on perceptions.

Think before you grunt: the social repercussions of grunting in the gym

While exercising in a public gym, we encounter a great variety of different people. Based on their appearance and actions, we might make certain assumptions about them and attribute certain characteristics to them. One type of people that may be encountered in a gym is the "*grunter*": a person (typically man) who lets out one grunt after the other while working out. A great deal of the grunter's exercises are accompanied by low, inarticulate sounds, that express their effort. When perceiving a grunter, what might a person think about them? Is the grunter perceived as more masculine, more attractive, healthier than a non-grunter? Even though the act of grunting is common practice in gyms, its influence on perceptions has not yet been studied. Present study focuses on the following question: "How does grunting in the gym affect the way a man is perceived?".

Grunting as a social phenomenon

Grunting can be defined as making a short, low noise, especially in surprise, pain or pleasure (Cambridge Academic Content Dictionary). Grunting has been found to be useful as a means to enhance sport performance (Callison et al., 2014; Sinnett et al., 2018; Tammany et al., 2021). Research has indicated that grunting is beneficial for increasing ball velocity when hitting groundstrokes in tennis (Callison et al., 2014), generating increased force when kicking (Sinnett et al., 2018) and increasing throwing velocity in baseball pitchers (Tammany et al., 2021). However, recent study has demonstrated another aspect of grunting, additional to its physical utility: its role as a social symbol (Hertzog & Lev, 2021). Grunting in gyms has been demonstrated to be a voluntary action, perceived as emerging from social interactions (learning "appropriate" grunting relies on a socializing process conveyed by peers), that is adapted to the specific social situation in which the person is involved (Hertzog & Lev, 2021). Thus, there is more to grunting than its practical use, it is a social phenomenon.

An ethnographic study by Hertzog and Lev (2021) has revealed that gymgoers have diverse opinions with respect to men that grunt in the gym. A number of gym goers voiced their negative associations with grunting men in the gym. One woman stated she associates grunting men with the throwing of weights after finishing a set (resulting in a feeling of physical vulnerability). Another noted the grunting is distracting her from her workout. Multiple gymgoers (both male and female) have had negative experiences when approaching a grunter and asking him to stop, receiving answers such as "if you have a problem go to work out in a different place". However, many gym goers, as well as trainers, perceive grunting as a necessary, positive thing, encouraging other men at the gym to grunt while working out as well. Grunting men are praised by these people for their loud exhalations, it serves as their masculinity's measurement and signifies strength and dominance (Hertzog & Lev, 2021).

The act of grunting in the gym among men can be used to maintain their control over space (Hertzog & Lev, 2019), as well as possibly assert dominance over non-grunters. In addition to physically taking up space, achieved by the aforementioned throwing of weights that can be associated with grunting, the act of grunting results in taking up space in a nonphysical way as well, by constantly producing sound when exercising and thus constantly emphasizing ones presence in the space. Other gymgoers might feel as "outsiders" if they do not accommodate the grunts (Hertzog & Lev, 2021). Non-grunters may be irritated or otherwise negatively affected by grunting, however, they might feel as though they have no choice but to ignore it. This could indicate that grunters have asserted a certain position of dominance in the gym.

Hertzog and Lev (2021) have been the first to research grunting in the gym as a socially constructed phenomenon, their qualitative study lead to some interesting findings that indicate a sociocultural functionality of grunting which needs to be empirically tested. A lot of (young) people go to the gym to exercise, these people may adapt their behaviour to other

gymgoers who grunt, thus learning to grunt while exercising as well (Hertzog & Lev, 2021). We propose that grunting in the gym changes the way a person is perceived by other people. This may be either a positive change (more masculine, attractive?) or a negative change (irritating, intimidating?). If grunting is linked to negative associations, this could have a negative impact on people in gyms and the gym environment. To further explore this sociocultural function of grunting and add onto Hertzog and Lev's (2021) qualitative study, present study has empirically tested the effect of grunting on certain perceptions.

Current research is the first experimental study to explore the effect of grunting on social perceptions. We tested the effect of grunting on a variety of outcomes, which have been composed into three main clusters regarding perceptions of gender, physical qualities and mental health. The clusters are composed as follows: (1) masculinity perception, (2) physical qualities cluster, consisting of attractiveness, perceived nutrition, perceived workout enjoyment and perceived exertion levels and (3) mental health/psychological cluster, consisting of perceived self-esteem, perceived body image- and life satisfaction and perceived warmth (e.g. friendly, good-natured, sincere, and warm) and competence (e.g. capable, competent, confident, and skilful). Current article is focused on the first two clusters.

Grunting in relation to masculinity perceptions

An individual's past experience with grunting men in the gym, or being aware of other people's experiences, may shape how this individual perceives grunting men in general due to *stereotyping*. To simplify our environment, we tend to group individuals based upon social information such as sex, race, age or certain behaviours (e.g., grunting in the gym), through a process of *social categorization* (Freeman & Stolier, 2016). These social categorizations can shape our perceptions of others, largely through stereotyping (Krueger, 2001). A *stereotype* can be defined as an oversimplified image or idea of a particular type of person (Oxford Advanced American Dictionary). This image or idea consists of particular characteristics that

are attributed to individuals that fit in a certain social category, based on cultural beliefs or personal experiences and observations. Therefore, when a grunting man in the gym is categorized as a 'grunter' by others, characteristics that are associated with the social category 'grunters' may be attributed to this particular individual. Thus, when an individual has had an encounter with a grunting man where he acted in a dominant manner, this may result in the individual having the notion that grunting men are dominant.

Generally, grunting in the gym is associated with stereotypically masculine traits, therefore, we predict perceived masculinity to be higher when a man is grunting. Generally, women are not encouraged to grunt or exhale loudly and seem to internalize the social expectation of women to be quiet during physical exertion (Hertzog & Lev, 2021). The small amount of women that do grunt in the gym are criticized and even ridiculed for 'behaving like men', or their grunting is likened to a disrespectful sexual image (Adam, 29: "When guys grunt, it grants them a certain amount of respect and glorification. When I hear a woman grunt, I automatically think of sex"). Grunting opposes the gender stereotypes of women to be more reserved, gentle, restrained and generally take up less space. Unlike women, grunting men are generally encouraged for their "masculine, powerful vocal conduct" (Hertzog & Lev, 2021). Overall, grunting seems to be associated with strength, dominance, control over space and emphasizing ones presence, as well as a certain refusal of adjusting to other people (who might find the grunting irritating or distracting). Therefore, grunting in the gym could be perceived as a stereotypically masculine thing, perhaps causing men to be seen as more masculine when grunting.

Homosexual men are generally perceived as less masculine than heterosexual men, therefore, one might wonder whether the supposed positive effect of grunting on masculinity perceptions extends to homosexual men as well. Heterosexual men express more negative attitudes toward feminine, rather than masculine homosexual men (Borinca et al, 2020).

Research has shown that in Italy both heterosexual and homosexual men reacted more negatively to homosexual men that were less masculine (Baiocco et al., 2016). Thus, in certain situations, being perceived as more masculine and less feminine may be beneficial for homosexual men. Considering this, being perceived as more masculine can be a privilege. To assess the effect of grunting for homosexual men, sexual orientation is included as an additional independent variable in the present study. We predict that grunting can increase masculinity perception in homosexual men as well, hence, grunting can aid in being granted the privilege of being perceived as masculine.

Grunting in relation to perceptions of workout intensity, fitness and attractiveness

The perceived physical characteristics cluster comprises outcome variables exertion, fitness and attractiveness. Fitness includes perceptions of overall health, as well as perceived workout enjoyment and nutrition. Exertion regards the perceived intensity level of the workout.

Although there are no direct studies testing the following effects before, we made predictions based on studies on similar areas. Firstly, we predict perceived exertion levels to be higher when a man grunts while exercising in the gym. A study of the effect of grunting on perceived serve speed in tennis has revealed that grunting appears to be processed by naïve observers (non-tennis players) as signifying greater effort or power, resulting in an overestimation of the speed of serves that are accompanied by a grunt (Farhead & Punt, 2015). Assuming that the association of grunting with greater perceived effort or power can be applied to sports generally, we propose that grunting will positively affect the perceived intensity level of a workout in the gym.

Moreover, we predict perceived fitness to be higher when a man grunts in the gym. Considering working out is generally known to improve health, we presume that when a person puts in a higher level of effort in working out, this might signify a higher level of

dedication to general health and fitness to other people. Thus, based on the assumption that grunting might result in higher levels of perceived effort when working out, we propose that grunting might heighten perceived fitness as well. There has not been any research on the effect of grunting on fitness perceptions, aforementioned predictions are purely our expectations.

Finally, we predict general attractiveness to be higher when a man grunts in the gym as a result from the presumably higher level of perceived health and masculinity when grunting. Research has revealed that the appeal of attractive traits such as symmetry and averageness are significantly reduced or eliminated when statistically controlling for perceived health, meaning these attractive traits might be appealing because they signify health (Crawford et al., 2007). This indicates that higher health perception correlates with higher attractiveness. In addition, several studies have found masculine men to be more attractive with regard to sexual selection then less masculine men (Hill et al., 2013; Hunt et al., 2018). We propose that aforementioned hypothetical positive effects of grunting on perceived health and masculinity can result in men being generally perceived as more attractive when grunting.

The Present Study

The general purpose of this study is to experimentally explore the effect of grunting on the way a man is perceived, by measuring participant's perceptions of a man when he is either grunting or not grunting while exercising. We propose that grunting influences the way a man is perceived by other people, meaning there might be certain social benefits to grunting, in addition to the benefits regarding sport performance. Specifically, we expect grunting men to be perceived as more masculine, more fit, more attractive and we expect his perceived workout intensity to be higher. Two main effects are expected: (1) grunting men will be perceived to be more masculine and (2) replicating previous studies, gay men will be

generally perceived to be less masculine. Finally, the following interaction effect is expected: (3) gay men who grunt will be perceived as more masculine, compared to gay men who do not grunt.

Method

The initial sample size in the conducted study was 369. A total of 16 participants dropped out of the study before completion and 12 participants were excluded due to failing the manipulation check. Additionally, one participant was excluded due to repetitive responding; the participant responded almost exclusively with scores of 1. Furthermore, 5 participants who reported a sexual orientation other than heterosexual were removed from the sample to increase the homogeneity of the sample, leaving us with a total sample size of N = 335. Of the 335 participants, 79 were male (23.6%), 255 (76.1%) were female and one person was non-binary (0.3%). The age range of participants was 18-79 years old (M = 34.66, SD = 13.048).

Procedure

The survey was hosted on Qualtrics, the participants were recruited through the Prolific Academic, and the study was conducted in English. The recruitment text used to advertise the study, briefly mentioned the nature and content of the experiment, namely watching a video of a man working out followed by a questionnaire measuring multiple variables. Participation was voluntary and there was monetary compensation of 1.50 euros for completing the study. The participants had to provide consent for processing their data, and information about participant identity was kept anonymous.

After having chosen to take part in the study, participants were required to read and fill out the informed consent prior to starting the experiment. Once the participants had agreed to the requirements of the study and filled out the informed consent form, certain demographic data were collected. Participants were asked about their gender, age, sexual orientation,

perceived socioeconomic status, education and how often they go to the gym to exercise. Participants were able to choose not to answer these questions if they did not want to. Afterward, they were randomly allocated to one of the conditions, watched the video with audio, and responded to the dependent variables. Furthermore, the participants' prolific ID was needed in order to transfer the compensation amount following the completion of the experiment. The data was collected anonymously and would be securely stored for 10 years on Qualtrics.

After completing the questionnaire, participants were debriefed on the study. The debriefing made participants aware of the other possible conditions of the study. Furthermore, it described the aim of the study and the variables the study intended to measure, which has been purposefully vague in the informed consent. The benign deception resulting from the manipulation of the sexuality variable was also made clear to the participants. Finally, the reasons for conducting the study were briefly explained, as well as the expected effects. The overall duration of the study was approximately 10 minutes.

Design

The current study used a 2x2 between-subjects design. Therefore, two independent variables were manipulated, namely, sexual orientation (heterosexual vs homosexual) and grunting (grunting vs no grunting). The participants were randomly assigned to one of the four conditions, which are grunting heterosexual ($N = 81$), non-grunting heterosexual ($N = 88$), grunting homosexual ($N = 78$) and non-grunting homosexual ($N = 89$).

Experimental Manipulation

There were four conditions: grunting heterosexual, non-grunting heterosexual, grunting homosexual and non-grunting homosexual. The sexual orientation variable was manipulated through means of a text appearing on the screen before the video began mentioning that the man working out was being filmed by his partner, a female name in the

heterosexual condition and a male name in the homosexual condition. The participant would then watch a video of the man performing a number of exercises. These exercises were a leg press, deadlift, overhead barbell and bench press. The grunting variable was manipulated by having the subject in the video grunt during his workouts through a voice-over, or remain silent. The subject was the same in every condition.

Measures

Variables pertaining to three different clusters were investigated: (1) psychological cluster, consisting of perceived warmth and competence, self-esteem and body and life satisfaction, (2) physical cluster, consisting of attractiveness and perceived fitness and exertion level and (3) gender cluster, consisting of masculinity, femininity, sexual objectification and perceived promiscuity. Current article will be discussing the physical cluster, as well as perceived masculinity and femininity.

Attractiveness, Fitness and Exertion

The physical cluster investigated participants' perceptions of attractiveness, fitness, and exertion level of the athlete. Attractiveness was investigated by one item on a Likert scale (1 = *not at all* to 7 = *entirely*). The perceived fitness of the athlete was investigated using six items regarding participants' perceptions of the athlete's overall health and fitness, nutrition and workout enjoyment. The items were measured using a Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) and were combined into a scale with an internal consistency of α = 0.77. Finally, perceived exertion level of the athlete was investigated using a Likert scale (1 = *extremely light intensity/no intensity* to 7 = *extreme intensity*).

Masculinity

Masculinity was measured using singular 7-point Likert scale questions directly asking participants to rate the athlete on masculinity (1 = *not at all* to 7 = *entirely*).

Checks

A manipulation check was conducted to test whether the sexual orientation manipulation was perceived by the participants. At the start of the survey, participants had to answer who had shot the video of the subject, which had been stated in the descriptive text the participants received prior to watching the video. If the answer given did not fit the assigned condition, their data got excluded from the statistical analysis ($N = 12$).

An audio check was performed at the start of the video to ensure that participants had adequate sound quality. This was done by playing an audio recording of someone listing a four-digit number, which the participant then had to fill in. Only when the participant filled out the correct four-digit number they would be able to proceed with the rest of the experiment. This eliminated the possibility of having data of people who were not able to distinguish the grunting taking place in the video.

As an attention check, participants were asked the name of the athlete in the video after having viewed the video, which had been stated in the descriptive text. This was done as an additional precaution to observe whether participants were retaining the information provided before the video and subsequent survey.

Results

The effect of grunting on perceived physical characteristics and masculinity perceptions, as well as the effect of sexual orientation on masculinity perceptions were assessed by an analysis of variance (ANOVA). The data meet all assumptions for ANOVA: (1) the data has been collected using independent random samples, (2) Levene's statistic indicates equal variances for every dependent variable (see appendix A, table 1) and (3) skewness and kurtosis levels of all variables are within absolute scores of respectively < 2 and < 4 (see appendix A, table 2), no significant departure from a normal distribution can thus be assumed, as proposed by West et al. (1996).

Effects of grunting and sexuality on masculinity perceptions

We ran a 2x2 ANOVA to assess effects of sexual orientation and grunting on masculinity. We found a significant negative effect of grunting on *perceived masculinity*: $F(1, 331) = 9.50$, $p = .002$, $\eta^2 = .028$. Contrary to our first main hypothesis, participants in the grunting condition gave the athlete a significantly lower rating on masculinity than participants in the non-grunting condition, see table 1 for means and standard deviations. Contrary to our hypothesis, we did not find a significant effect of homosexuality on perceived masculinity ($F(1, 331) = .12$, $p = .732$, $\eta^2 = .000$). Furthermore, we did not find any significant interactions between sexual orientation and grunting on perceived masculinity ($F(1, 331) = .12$, $p = .732$, $\eta^2 = .000$).

Table 1

Means and standard deviations of perceived femininity and masculinity for all conditions

			Mean	Std. deviation
Heterosexual	No grunting	Masculinity	5.17	1.25
		Femininity	1.93	1.02
	Grunting	Masculinity	4.78	1.44
		Femininity	1.74	1.17
Homosexual	No grunting	Masculinity	5.17	1.16
		Femininity	2.06	1.25
	Grunting	Masculinity	4.68	1.39
		Femininity	2.05	1.39

Effects of grunting and sexuality on perceived physical characteristics

We ran a 2x2 ANOVA to assess effects of sexual orientation and grunting on several perceived physical characteristics. Contrary to our expectation, we did not find a significant effect of grunting on *perceived fitness* ($F(1, 331) = 3.80$, $p = .052$, $\eta^2 = .011$). However, we did find a significant positive effect of sexual orientation on perceived fitness: $F(1, 331) = 4.65$, $p = .032$, $\eta^2 = .014$. Participants in the homosexual condition perceived the athlete as significantly more fit than participants in the heterosexual condition, see table 2 for means and

standard deviations. We did not find any significant interactions between sexual orientation and grunting on perceived fitness ($F(1, 331) = .004$, $p = .950$, $\eta^2 = .000$).

Additionally, we found a significant negative effect of grunting on *attractiveness*: $F(1, 331) = 15.05$, $p < .001$, $\eta^2 = .043$. Contrary to our expectation, participants in the grunting condition found the athlete significantly less attractive than participants in the non-grunting condition (see table 2). Furthermore, we found a significant positive effect of sexual orientation on attractiveness: $F(1, 331) = 6.97$, $p = .009$, $\eta^2 = .021$. Participants in the homosexual condition found the athlete significantly more attractive than participants in the heterosexual condition (see table 2). We did not find any significant interactions between sexual orientation and grunting on attractiveness ($F(1, 331) = 2.51$, $p = .114$, $\eta^2 = .008$).

Moreover, we found a significant positive effect of grunting on *perceived exertion level*: $F(1, 331) = 6.75$, $p = .010$, $\eta^2 = .020$. Participants in the grunting condition perceived the exertion level of the athlete during his workout as significantly higher than participants in the non-grunting condition (see table 2), this effect is in line with our expectations. We did not find a significant effect of sexual orientation on perceived exertion ($F(1, 331) = 0.08$, $p = .781$, $\eta^2 = .000$), or any significant interactions between sexual orientation and grunting on perceived exertion ($F(1, 331) = 0.459$, $p = .498$, $\eta^2 = .001$).

Table 2

Means and standard deviations of perceived physical characteristics for all conditions

			Mean	Std. deviation
Heterosexual	No grunting	Fitness	5.75	0.64
		Attractiveness	4.17	1.46
		Exertion	4.49	0.82
	Grunting	Fitness	5.61	0.70
		Attractiveness	3.25	1.54
		Exertion	4.81	1.01
Homosexual	No grunting	Fitness	5.92	0.67
		Attractiveness	4.35	1.60
		Exertion	4.53	0.91

Grunting	Fitness	5.77	0.69
	Attractiveness	3.96	1.56
	Exertion	4.72	0.88

Exploratory – Gender and the effect of grunting

We ran a 2x2x2 ANOVA to assess the influence of the gender of a participant on the effect of grunting and sexual orientation on masculinity perceptions and several perceived physical characteristics. We found a significant interaction effect between gender and grunting on *perceived masculinity*: $F(1, 326) = 3.94$, $p = .048$, $\eta^2 = .012$. Male participants in the grunting condition gave the athlete on average a slightly higher masculinity rating than male participants in the non-grunting condition, whereas female participants in the grunting condition gave the athlete on average a lower masculinity rating than female participants in the non-grunting condition (see figure 1). We did not find any significant interactions between gender and sexual orientation on perceived masculinity ($F(1, 326) = 0.25$, $p = .618$, $\eta^2 = .001$).

Furthermore, we found a significant interaction effect between gender and grunting on *attractiveness*: $F(1, 326) = 6.36$, $p = .012$, $\eta^2 = .019$. Male participants in the grunting condition found the athlete on average more attractive than male participants in the non-grunting condition, whereas female participants in the grunting condition found the athlete on average less attractive than female participants in the non-grunting condition (see figure 2). Moreover, we found a significant interaction effect between gender and sexual orientation on attractiveness: $F(1, 326) = 4.00$, $p = .046$, $\eta^2 = .012$. Male participants in the homosexual condition found the athlete on average less attractive than male participants in the heterosexual condition (respectively $M = 3.76$, $SD = 1.64$ & $M = 3.90$, $SD = 1.63$), whereas female participants in the homosexual condition found the athlete on average more attractive than female participants in the heterosexual condition (respectively $M = 4.31$, $SD = 1.54$ & $M = 3.65$, $SD = 1.56$).

Additionally, we found a significant interaction effect between gender and grunting on *perceived fitness*: $F(1, 326) = 4.61$, $p = .033$, $\eta^2 = .014$. Male participants in the grunting condition perceived the athlete as more fit than male participants in the non-grunting condition, whereas female participants in the grunting condition perceived the athlete as less fit than female participants in the non-grunting condition (see figure 3). We did not find any significant interactions between gender and sexual orientation on fitness ($F(1, 326) = 3.10$, $p = .079$, $\eta^2 = .009$).

Figure 1

Mean perceived masculinity for each grunting condition, comparing female and male participants

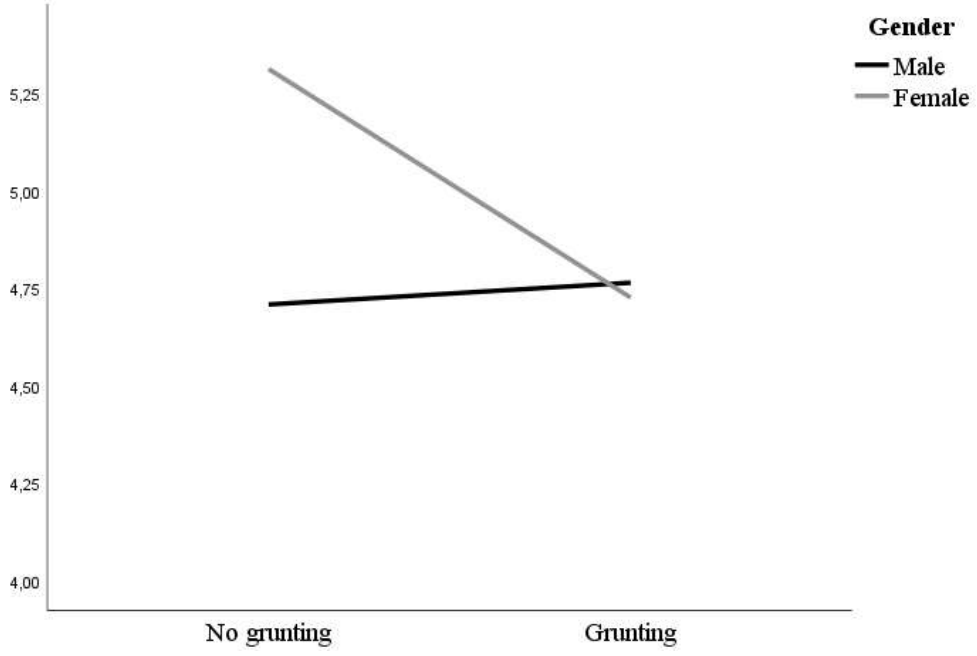


Figure 2

Mean attractiveness for each grunting condition, comparing female and male participants

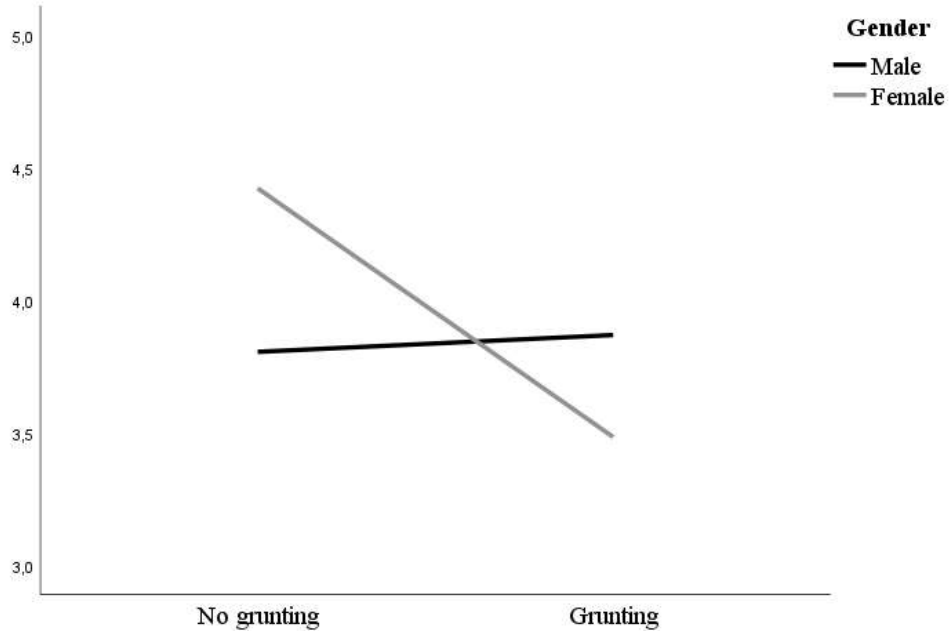
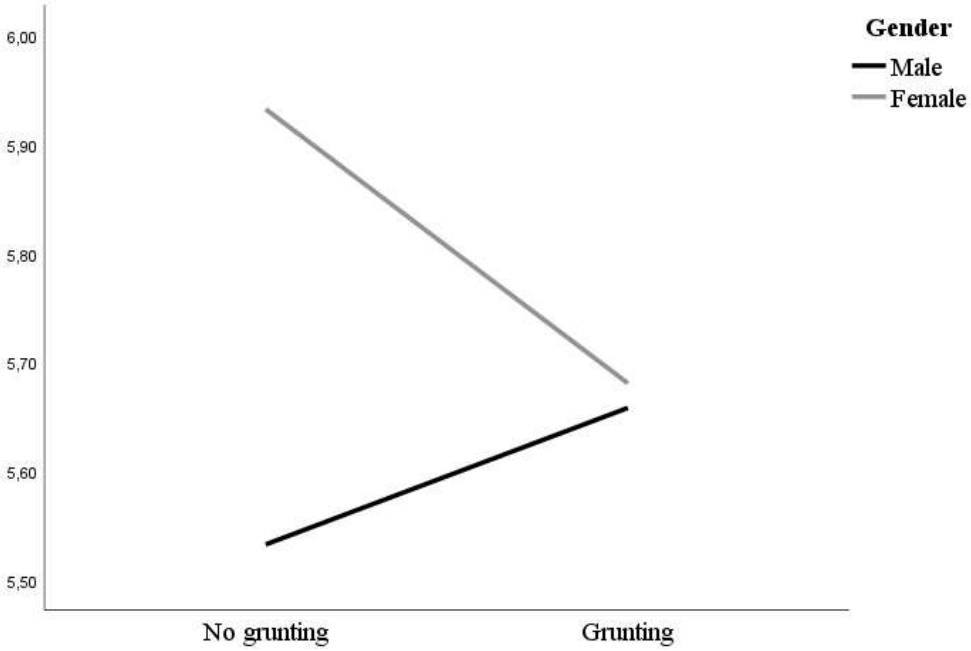


Figure 3

Mean perceived fitness for each grunting condition, comparing female and male participants



Discussion

Current study aimed to explore the sociocultural function of grunting. We proposed that grunting in the gym influences the way in which a man is perceived by other people. More specifically, we expected grunting to positively affect masculinity perceptions, attractiveness and perceived fitness and exertion. Additionally, current study explored whether this sociocultural function of grunting is present regardless of sexual orientation. We expected grunting to have a positive effect on masculinity for homosexual men as well as heterosexual men. Furthermore, we expected a negative effect of homosexuality on perceived masculinity, considering homosexual men are generally perceived as less masculine than heterosexual men.

Grunting, sexual orientation and masculinity perceptions

Our results indicate that grunting affects how masculine a man is perceived by others. We found a significant negative effect of grunting on perceived masculinity, which implies that people find a man less masculine when he grunts in the gym. This effect is opposite to our first main expectation. However, when assessing the perceived masculinity means for men and women, grunting caused a considerable decline in the female participants' mean, whereas the male participants' mean showed a (very slight) increase. This implies that grunting affects masculinity perceptions differently for men and women; gender may be a moderator variable.

Our prediction that grunting men are perceived as more masculine was based on the fact that grunting has been associated with stereotypically masculine traits such as strength and dominance. However, Hertzog and Lev's (2021) study implies that men predominantly perceive grunting as either neutral ("it's natural") or positive ("it grants respect and glorification"), whereas women are mostly portrayed to have negative associations with grunting men, such as intimidating, annoying and distracting. Considering being masculine

can be seen as a positive, desirable trait for a man, women perhaps perceive a man as less masculine when he grunts because they find him less likeable. Considering our sample largely consisted of women (76.1%), this could explain why we saw an overall negative effect of grunting on perceived masculinity. Future research should include a balanced gender of participants and consider participant gender as an important factor in the analysis.

Furthermore, we found no significant effect of sexual orientation on perceived masculinity, which implies that a man's sexual orientation does not influence how masculine others find him. This finding goes against our second main expectation, which is based on the notion that homosexual men are stereotypically perceived as less masculine than heterosexual men. Research has indicated men have generally less accepting attitudes towards homosexual men than women (Hoffman et al., 1980; Steffens & Wagner, 2004; Wills & Crawford, 1999), considering our sample is predominantly female, this could explain the fact we did not find a significant effect of sexual orientation on masculinity perceptions.

We found no significant interaction effect between grunting and sexual orientation on perceived masculinity. This indicates that a man's sexual orientation does not influence the way grunting affects his perceived masculinity. Our results go against our expectation that gay men who grunt are perceived as more masculine compared to gay men who do not grunt. This is due to the fact that the main effect of grunting on masculinity we found was the opposite of the positive effect we expected. However, our results do support our prediction that the social function of grunting extends to homosexual men as well as heterosexual men.

Grunting and perceptions of physical characteristics

Our results indicate that grunting affects the way others perceive certain physical qualities. Firstly, we found a significant positive effect of grunting on perceived exertion level, which indicates that people perceive a man's workout to have a higher intensity level when he is grunting. This finding is in line with our expectations.

Furthermore, we found a significant negative effect of grunting on perceived fitness, which indicates that people think a man has lower general fitness when he is grunting in the gym. This finding goes against our expectations; based on our assumption that grunting would increase perceived exertion, we predicted grunting would also increase perceptions of fitness, due to higher perceived level of effort in working out. However, increased perceived exertion due to grunting may imply that a grunting man is perceived to need more effort to complete his workout than a non-grunting man, thus resulting in the perception that a grunting man is less fit.

Additionally, we found a significant interaction effect between gender and grunting on perceived fitness, indicating that the effect of grunting on how fit others think a man is, is affected by the gender of the perceiver. Women perceived the grunting man on average to be less fit than the non-grunting man, whereas men perceived the grunting man to be more fit. This supports the possibility that men and women may generally have different associations with grunting; perhaps men assume grunting indicates that a man is powerful, thus fit, and women assume grunting indicates a man is struggling, thus less fit.

Moreover, we found a significant negative effect of grunting on attractiveness, which indicates that people find a grunting man less attractive than a non-grunting man. This finding is opposite our expectation; based on our assumption that grunting would increase perceived fitness, we predicted grunting would increase attractiveness. However, considering our results indicate a negative effect of grunting on perceived fitness, this may explain the negative effect of grunting on attractiveness; generally, health and fitness correlate with attractiveness (Crawford et al., 2007).

Lastly, we found a significant interaction effect between gender and grunting on attractiveness, indicating that the effect of grunting on how attractive a man is to others, is affected by the gender of the perceiver. Men found the athlete to be slightly more attractive

when grunting, whereas women found the athlete considerably less attractive when grunting. This implies that the negative effect of grunting on attractiveness may be explained by women's aforementioned seemingly negative associations with grunting; women possibly find a grunting man less attractive because they find him less likeable.

Implications

Current research provides the first experimental exploration of the sociocultural functionality of grunting in the gym. Our results provide empirical support for the notion that grunting does not only have a physical function, but a social function as well. Our data indicate that grunting changes the way a man is perceived, with regard to various characteristics. Considering our results indicate there are various negative social repercussions to grunting in the gym, such as being perceived as less masculine, less fit and less attractive, gym staff and members should perhaps re-evaluate their possibly supportive attitude regarding grunting. People at gyms may learn from others to grunt while exercising, not knowing how this could negatively affect others' perceptions of them. Additionally, grunting may contribute to a negative gym atmosphere.

Limitations and future directions

Firstly, our results have limited generalizability, as a result of our sample consisting largely of women. Future research should use a more balanced sample with regards to gender, to get a more accurate representation of the population. In addition, future research could focus on the possible moderating role of gender in the effect of grunting on social perceptions, considering our results indicate that gender plays a role in the influence of grunting on perceptions. An additional possible moderator could be whether the perceiver goes to the gym to exercise or not. Considering individuals who frequently go to the gym may have very different experiences and as a result different associations with grunting men, as opposed to

those who never go to the gym, an interesting perspective could be to exclusively include participants that go to the gym to exercise.

Furthermore, we solely focused on the effects of grunting on the way a man is perceived. Associations with grunting have been found to be very different depending on whether the grunter is a man or a woman, thus, future research regarding perceptions about women who grunt would be an interesting addition to the present study. An additional perspective for future study could be replicating current research in different countries, to assess a possible influence of societal norms about masculinity.

Moreover, as a result of the online nature of our study, ecological validity is limited. To increase ecological validity, future study could be conducted in a real life gym setting. Additionally, the sizes of the effects we found were generally very small. This may indicate limited practical implications (the effects could be so small that they may not be noticeable in real life settings). More replications of the study are needed.

Finally, certain aspects of the video could be improved in future research. Due to the fact that the grunting was put in the video by means of a voice-over, the sounds were not very realistic and seemed a bit silly. To make the video resemble a more realistic situation, future studies should use a video where the athlete is actually grunting, as opposed to a very obvious voice-over. Additionally, the music playing in the background of the video could have been distracting, as well as affecting how lifelike the video seemed. Therefore, future research should not include music in the background. Perhaps future studies could use a video with sounds that resemble an actual gym environment more closely.

Conclusion

Our results imply that grunting in the gym affects the way a man is perceived by others. More specifically, we found a negative effect of grunting on perceived masculinity, attractiveness and perceived fitness, as well as a positive effect on perceived exertion.

Unexpectedly, we did not find an effect of sexual orientation on masculinity. This may be explained by the fact that our sample is predominantly female. Our results imply that the effect of grunting on perceived masculinity is present regardless of sexual orientation. Current study suggests that the positive attitude regarding grunting in the gym should be re-evaluated, considering grunting seemingly leads to negative social repercussions and may contribute to a negative gym atmosphere.

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Appendix A

Table 1

Levene's statistics

	Levene Statistic	df1	df2	Sig.
Fitness	0.197	3	331	0.898
Masculinity	1.106	3	331	0.347
Attractiveness	1.167	3	331	0.322
Exertion	0.648	3	331	0.585

Table 2

Kurtosis and skewness levels

			Skewness		Kurtosis	
Condition			Statistic	Std. Error	Statistic	Std. Error
Heterosexual	No grunting	Fitness	-0.475	.257	0.682	.508
		Masculinity	-0.582	.257	0.746	.508
		Attractiveness	-0.258	.257	0.078	.508
		Exertion	0.167	.257	0.880	.508
	Grunting	Fitness	-0.401	.267	-0.104	.529
		Masculinity	-0.448	.267	0.163	.529
		Attractiveness	0.218	.267	-0.592	.529
		Exertion	-0.413	.267	1.213	.529
Homosexual	No grunting	Fitness	-0.161	.257	-0.584	.508
		Masculinity	-0.205	.257	-0.074	.508
		Attractiveness	-0.374	.257	-0.527	.508
		Exertion	0.338	.257	-0.629	.508
	Grunting	Fitness	0.144	.272	-0.647	.538
		Masculinity	-0.471	.272	-0.007	.538
		Attractiveness	-0.421	.272	-0.349	.538
		Exertion	0.708	.272	0.650	.538