

# **Examining People's Perceptions of Those Who Grunt in the Gym**

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### **Abstract**

Grunting in sports has caught the attention of multiple researchers in recent years. However, the effect of grunting in the gym is rather unknown. Previous research already argued that grunting is a socially constructed phenomenon. We conducted an experiment to examine what perception people have of those who grunt in the gym. The sample consisted of 327 participants from the United Kingdom. A series of 2x2 ANOVA was used to analyze the different perceptions people have depending on gender and whether the target was grunting. The first hypothesis, whether men are perceived as more masculine, was rejected. In contrary, people perceived the grunting target to be less masculine than the control target. The second hypothesis, whether there is a significant difference of perceived socioeconomical status (SES) depending on grunting, was supported. People perceived the grunting target as having a lower socioeconomical status. The third hypothesis, that men are perceived more dominant when grunting, was also supported by the results. These findings are important to broaden the knowledge of social interactions and stereotypes in the gym.

*Keywords:* Gym, Sport, Stereotypes, Grunting, Masculinity, Dominance, Socioeconomical Status (SES)

## **Examining People's Perceptions of Those Who Grunt in the Gym**

One might go to the gym and encounter someone grunting. One might have certain feelings or stereotypes about someone grunting in the gym. Some of these perceptions that probably come to mind are dominance and masculinity. One might even go as far as to think if people who grunt in the gym might be a member of a lower socioeconomical class. These are all relevant stereotypes when we imagine someone who grunts at the gym, and the focus of this study is to test how grunting influences perceptions of the grunter, in particular the perceived masculinity of the grunter. Moreover, this study will examine what the effect of grunting is on perceived socioeconomic status (SES) and perceived (social) dominance. Accordingly, the research question for this study is: how does grunting during workouts affect the perceived masculinity, social economic status and dominance of the athlete at the gym? In order to check for difference in male and female perceptions, we will also include participants of both binary genders.

### **Grunting and its Potential Effects**

In the sport industry, grunting has been an interest for some time now. However, it is still unclear why people grunt during workouts. Research shows that grunting does not have a significant influence on maximum force production during deadlifts (Morales et al., 1999), so grunting will not help with lifting more. Sinnett et al. (2018) shows that grunting may distract an opponent in martial arts, but in a normal gym session, gym-goers do not have any opponents. So why would they grunt? Another study shows that in tennis the force, velocity, and peak muscles are significantly enhanced, when allowed to grunt during a tennis serve (O'Connell et al., 2014). So, grunting does have some effect on sport activities, but it is not really clear when and how these advantages come into play.

There is more to grunting than physical enhancement in sport alone. Lev and Hertzog (2021) argue that there are voluntary reasons for people to grunt. According to them, grunting

in the gym is socially constructed and a voluntary action, that is adjusted according to the situation. Since it is socially constructed, people who perceive those who grunt, will probably have thoughts and stereotypes about them. If grunting is a socially constructed phenomenon, what could be affected by grunting? In this study, we are testing the effect of grunting on a number of variables.

Currently there is lack of research and no clear consensus about the effect that grunting has on people who see someone grunting in the gym. However, a person who grunts will probably attract some attention from people and form a perception or stereotype of them, because stereotyping is a persistent human tendency that helps humans to categorize and simplify the complex world (Zhang et al., 2022). There might be a discrepancy between how the grunter thinks he is being perceived and how people actually perceive those who grunt. Therefore, the main focus of this study is to find out how people perceive those who grunt in the gym and what their stereotype of them is. There are various variables that could be interesting to study the effect of grunting. This study focusses on perceived masculinity, perceived SES and perceived dominance.

The first hypothesis is that men who grunt are perceived to be more masculine. Masculinity is defined as the characteristics that are traditionally thought to be typical for men (Cambridge University Press, n.d.). According to Lev & Hertzog (2021), grunting is even expected from masculine men in the gym even though females who grunt in the gym are associated with taboo and sexual images. So, while grunting is seen as normal for men, it is frowned upon for women to grunt. Lev & Hertzog (2021) also mention that in some examples women who grunt are ridiculed for behaving “like men”. This is anecdotal evidence that gymgoers view grunting in women as more masculine behavior. In this study we only look at perceived masculinity of men who grunt during a workout. Therefore, the hypothesis that men who grunt will be seen as more masculine.

The second hypothesis is that grunting has a significant effect on perceived socioeconomic status (SES). According to the APA Dictionary (2023), SES encompasses educational attainment, occupational prestige, and subjective perceptions of class and status. Currently there is no research on the effect of grunting on perceived SES. This variable is interesting, because it can indicate how much people tend to stereotype people on minor differences. If people base their perception of SES on whether or not someone grunts during a workout, it says a lot about how quickly people make stereotypes. There will be no hypothesis about whether people perceived those who grunt to be in a higher or lower SES. We are solely interested in whether there is any effect of grunting.

The third hypothesis is that men who grunt are perceived as more dominant. Social dominance is defined as the extent to which a person is influential in their social group, affecting movement, opinion and performances across contexts (Roriguez-Santiago et al., 2020). In the current literature no direct relation has been found between grunting and dominance, but Watkins et al (2010) argue that masculine characteristics, such as masculine vocal characteristics, are correlated with dominance. Therefore, it seems logical that grunting would affect the perception of dominance. Hertzog & Lev (2019) also argue that grunting signifies dominance and strength. Therefore, we expect that men who grunt will be perceived as more dominant.

Overall, this study aims to answer the following research question: what is the effect of a grunting man in the gym on perceptions? To achieve this aim, we conducted an experiment. The main outcome variable is the perceived masculinity. Next to the main outcome, this study also examines the effect of grunting during workouts on perceived SES and the effect of grunting during workouts on social dominance. Finally, to test if men and women differ in their perceptions, we recruited a gender balanced sample, however, in the absence of previous literature, we do not make predictions regarding gender.

## Method

### Participants and Design

We aimed to recruit 320 participants so that we could have 80 participants per cell in the design. A total of 342 participants answered the online questionnaire, all recruited via Prolific ([www.prolific.com](http://www.prolific.com)), and exclusively from the United Kingdom. Fifteen participants were excluded from the study for various reasons: One person declined consent for data processing, eleven individuals withdrew from the study, and three people failed the manipulation check. There were no exclusion criteria for age. Initially, our intention was to exclude respondents who do not frequent the gym. However, due to an error by Prolific, the exclusion was not successful, and consequently, we decided to include these respondents in our analysis. This resulted in a final sample size of  $N = 327$ . The mean age of the remaining participants was 42 years, with a range from 18 to 78 years ( $SD = 12.7$ ). Gender distribution was nearly equal with 49.5% identifying as female, and 50.5% identifying as male.

The study was registered by the Ethical Committee of the Faculty of Behavioral and Social Sciences at the University of Groningen (EC-BSS). This study was pre-registered (AsPredicted #171791). To investigate the relationship between grunting and perceptions of masculinity and other variables, we designed an experiment using a 2x2 design. The independent variables were gender (male vs. female) and grunting (grunting vs. no grunting). Participants were randomly assigned, based on their gender, to either watch a video featuring a man grunting or one without grunting. This allocation resulted in the following conditions: Female and grunting ( $N = 77$ ), female and no grunting ( $N = 85$ ), male and grunting ( $N = 85$ ) and male and no grunting ( $N = 80$ ).

### Procedure

Once participants opened the survey, the first thing they saw was a form detailing information about the study and requesting informed consent. Participants had the option to

either give or decline their consent, without any consequences for them. Thereafter the participants were exposed to attention and sound checks. Participants had to fill in the right digit span to continue the study, to ensure they could hear the sound in the video as well. This was a crucial step, as this research relies on the participant's audition of the target's grunting (or lack thereof). Therefore, it was important to make sure the potential grunting in the video would be properly heard by the participants.

Afterwards, the following text was shown: "*Now you will see a video of Jamie working out in the gym. Jamie likes working out at the gym regularly. In this video he is the person wearing a black T-shirt and green shorts. Please now watch the following video carefully. You will answer some questions evaluating Jamie based on his workout.*" Beneath the text the participants could start the video of a man working out in a gym environment. Participants in the grunting condition were shown the man grunting during exercising and participants in the no grunting condition were shown the exact same video with the exception of the grunting noise. In the no-grunting condition, the man was solely exhaling. After watching the video, participants in both conditions were asked the same questions.

When participants went to the next page, they were asked three questions to check if they paid attention. The following questions were: "*What is the name of the man working out?*", "*What is the man wearing in the video?*" and "*Was the man in the video making noisy breathing sounds (i.e., grunting)?*", which served as a manipulation check.

After the manipulation check, participants answered questions about the measures outlined below. On the last page, participants were asked to fill in the following four questions regarding the demographic. Participants were asked about their (1) age, (2) gender, (3) how often they go to the gym, and (4) whether they frequent a mixed-gender gym. Finally, the participants were asked for their Prolific ID, were debriefed about the aim of the study, thanked and paid for their participation in the study.



## **Materials**

To test our hypotheses, a 44 second long video was created in which a white male, who was 23 years of age, performs four different exercises in strict form: Incline dumbbell bench-press, dumbbell biceps curls, overhead triceps extensions at a cable tower, and back-squats at a smith machine respectively. Each exercise was recorded separately and cut together to create the final video. For each exercise, three repetitions were performed. These exercises were chosen because they are commonly implemented in the male trainings-regime, while also prioritizing free weights to foster the association to masculine norms regarding choice of equipment. The weights were chosen in a fashion to justify the grunting noise in the grunting condition, resulting in 22kg, 16kg, 35kg, 60kg (excluding the weight of the Barbell) respectively. The man was filmed from about 2.5 – 3 meters using an iPhone 14 and a tripod. To ensure good audio quality, a separate microphone was used, placed close to the target. The man was filmed from an 80 – 90-degree angle, with the exception of a 135-degree angle used for the back-squat, to ensure that the facial expressions would not influence the grunting vs the no-grunting condition, while still making it possible for the participant to answer questions about the measured variables, e.g., attractiveness. There was no music in the gym, but air-conditioning noise from the building. During some exercises, one person worked out in the background or on the side, to facilitate an authentic atmosphere of a gymnasium as experienced by most gym-goers. Lastly, and most importantly, the video in the grunting and no-grunting condition were exactly the same, with the only difference being the grunting noise, which was edited out after filming.

## **Measures**

The complete list of items for each measure is presented in Appendix A.

### ***Perceived Aggressiveness***

Participants were asked to rate the extent to which they perceived the target to be aggressive. The assessment of this construct was done using a single self-constructed item: “*To what extent do you think [the target] is aggressive?*”. The answer options were presented on a scale of 1 - *not at all*; to 7 - *entirely*.

### ***Perceived Masculinity***

We aimed to examine the extent to which the participants perceived the target to be masculine. We made use of the following self-constructed singular item to assess this construct: “*To what extent do you think [the target] is masculine?*”. The answer options were presented on a scale of 1 - *not at all*; to 7 - *entirely*. Additionally, the Bem Sex-Role Inventory (BSRI; Bem, 1974) specified below measured specific traits about masculinity; as opposed to the aforementioned single item measuring the broad concept of masculinity.

### ***Traditional Male Gender Norms***

We assessed participant’s perceptions of traditional male gender norms through three items derived from the Bem Sex-Role Inventory (BSRI; Bem, 1974). Participants were asked to what extent they rated the man in the video to be (1) “*Assertive*”, (2) “*Independent*”, and (3) “*Ambitious*” ( $\alpha = 0.80$ ). The anchors ranged from 1 - *not at all*; to 7 - *entirely*. The items were averaged to calculate a single composite score for perceived traditional masculinity.

### ***Perceived Social Dominance***

Participants were asked to rate to what extent they consider the target to be socially dominant. The operationalization of this construct was derived from Rodriguez-Santiago et al. (2020)’s study, which assimilated male social dominance to aggressiveness, leadership traits and as being socially central. The items for social dominance ( $\alpha = 0.85$ ) included “*I think this person typically takes on a leadership role in social settings*”. The answer options were presented on a scale of 1 - *strongly disagree*; to 7 - *strongly agree*. All the items were averaged to compute one composite score for perceived social dominance.

### ***Perceived Attractiveness***

Participants were asked to rate the target's attractiveness. This construct was assessed using 9 items adapted from McCroskey & McCain (1974)'s study measuring interpersonal attractiveness. This measure consisted of three distinct domains: social attractiveness, task attractiveness and physical attractiveness. Participants were asked to indicate to what extent they agree with different statements. The items for social attractiveness ( $\alpha = 0.79$ ) included "I would like to have a friendly chat with him". The items for physical attractiveness ( $\alpha = 0.78$ ) included: "I think the man is handsome". The items for task attractiveness ( $\alpha = 0.85$ ) included: "I have the feeling that he is a very good weightlifter". Overall, the construct of attractiveness had a good reliability ( $\alpha = 0.85$ ). The answer options were presented on a scale of 1 - *strongly disagree*; to 7 - *strongly agree*. All the items were averaged to compute one composite score for perceived attractiveness.

### ***Perceived SES***

The MacArthur Scale of Subjective Social Status adult version (Adler et al., 2000) was used to measure participant's perceived SES of the man in the video. Participants were shown a ladder with the numbers zero to ten on it and were told that the ladder represented society. People on top of the ladder are best off in terms of money, education and working the most respected jobs. People on the bottom of the ladder are worse off, so have less money, lesser education and the least respected job or no job. The task participants were shown was: "*Please select the number of the rung that best represents where you think the person in the video (Jamie) stands on the ladder*". The answers options were presented on a scale from 1 - *ten*; to 11- *zero*.

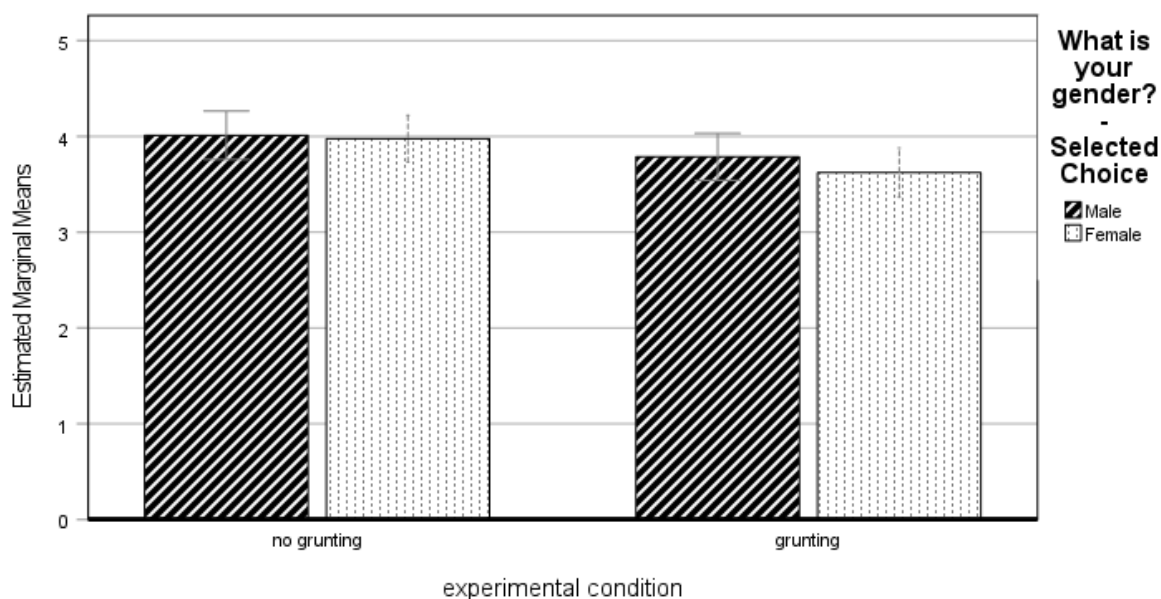
In this paper only perceived masculinity, perceived dominance and perceived SES will be discussed. The other variables are discussed in papers from peers from the bachelor thesis group.

## Results

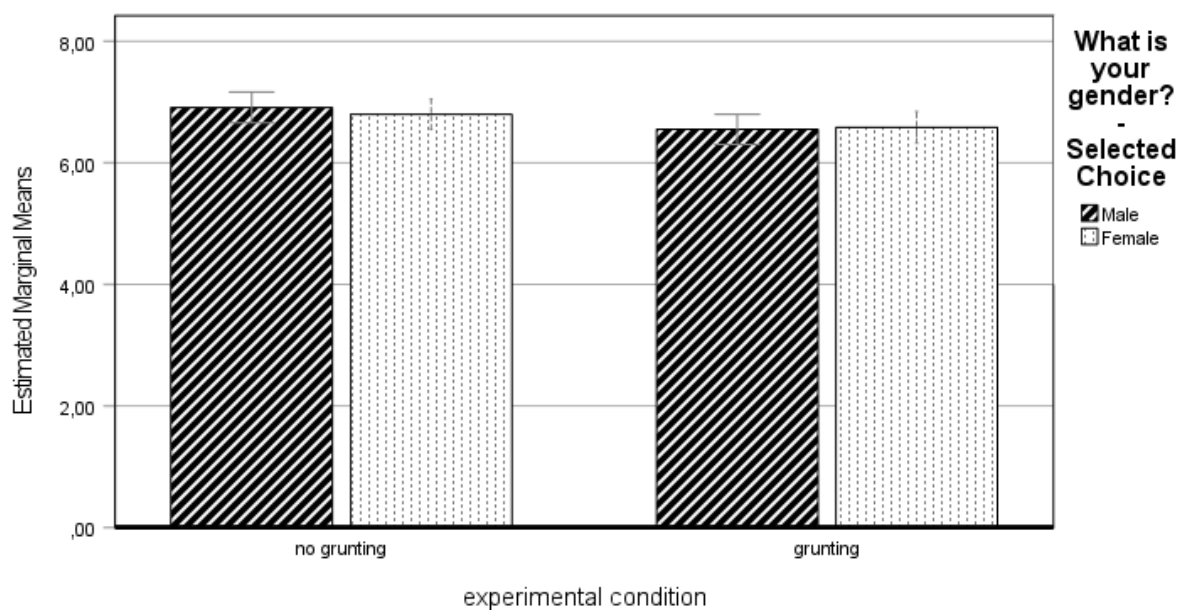
To analyse the data three 2x2 ANOVAs were ran. All three of them had gender and the experimental condition as independent variables. The first one had perceived masculinity as dependent variable, the second had dominance as dependent variable and the third had SES as dependent variable. An additional ANOVA with Bem Sex-Role Inventory as dependent variable was ran to examine the difference between the two operationalizations of masculinity.

For perceived masculinity, the Levene's test adhered to the null hypothesis of equal population variances  $F(3,323) = 1.89, p = .131$ , indicating the assumption of homogeneity of variance was met. As shown in Figure 1, the ANOVA gave a significant effect of the experimental condition  $F(1,323) = 6.80, p = .023, \eta p^2 = .016$ . Those in the grunting condition perceived the target to be more masculine ( $M = 3.71; SD = 1.16; n = 162$ ) compared to those in the control condition ( $M = 3.99; SD = 1.13; n = 165$ ). There was no significant main effect of gender  $F(1,323) = .63, p = .429, \eta p^2 = .002$ . Similarly, there was no significant result for the interaction between gender and grunting,  $F(1,323) = .26, p = .612, \eta p^2 = .001$ .

However, masculinity was also measured by using Bem Sex-Role Inventory questions. For this operationalization of masculinity, the ANOVA showed the following non-significant results: for gender  $F(1,323) = .048, p = .828, \eta p^2 = .000$ ; for the experimental condition  $F(1,323) = 0.11, p = .737, \eta p^2 = .000$ ; and for the interaction  $F(1,323) = 0.47, p = .492, \eta p^2 = .001$ .

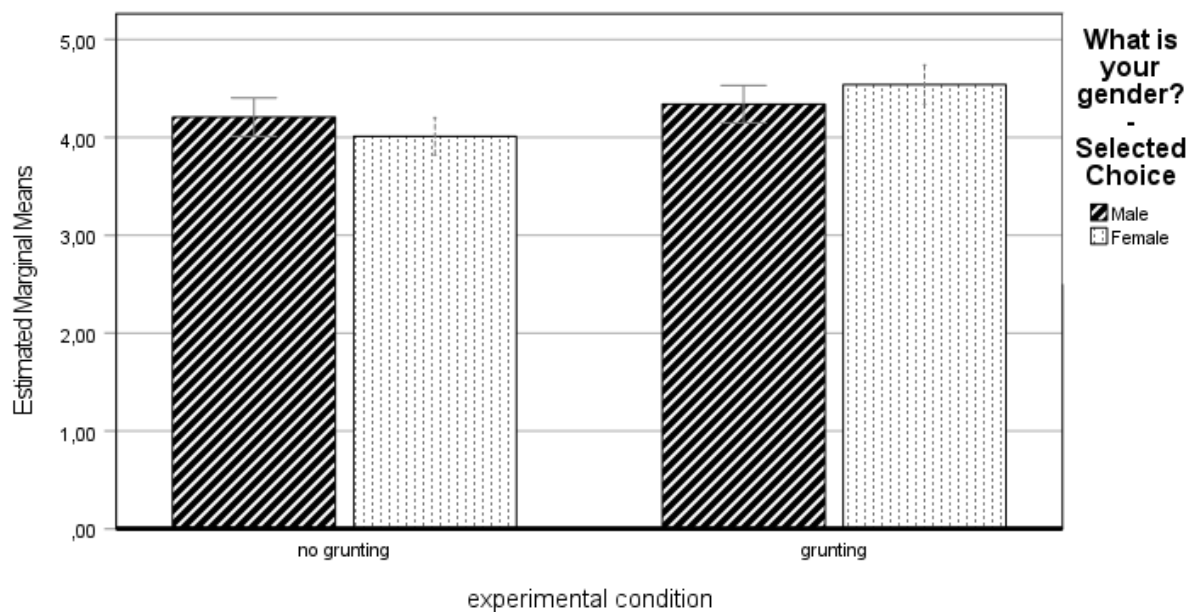
**Figure 1***Estimated Marginal Means of Perceived Masculinity**Error bars: 95% CI*

For perceived SES, the Levene's test adhered to the null hypothesis of equal population variances  $F(3,323) = 1.336, p = .262$ , indicating the assumption of homogeneity of variance was met. As shown in Figure 2, the ANOVA gave a significant effect of the experimental condition  $F(1,323) = 4.98, p = .026, \eta p^2 = .015$ . Those in the grunting condition perceived the target to be of a lower socioeconomical status ( $M = 6.57; SD = 1.19; n = 162$ ) compared to those in the control condition ( $M = 6.86; SD = 1.13; n = 165$ ). There was no significant main effect of gender  $F(1,323) = .10, p = .75, \eta p^2 = .000$ . Similarly, there was no significant result for the interaction between gender and grunting,  $F(1,323) = 0.31, p = .58, \eta p^2 = .001$ .

**Figure 2***Estimated Marginal Means of Perceived SES*

Error bars: 95% CI

For perceived dominance, the Levene's test adhered to the null hypothesis of equal population variances  $F(3,323) = 0.337, p = .799$ , indicating the assumption of homogeneity of variance was met. As shown in Figure 3, the ANOVA gave a significant effect of the experimental condition  $F(1,323) = 11.22, p < .001, \eta p^2 = .034$ . Those in the grunting condition perceived the target to be less dominant ( $M = 4.44; SD = 0.83; n = 162$ ) compared to those in the control condition ( $M = 4.11; SD = 0.95; n = 165$ ). There was no significant main effect of gender  $F(1,323) = .00, p = .986, \eta p^2 = .000$ . Similarly, there was no significant result for the interaction between gender and grunting,  $F(1,323) = 4.02, p = .05, \eta p^2 = .012$ .

**Figure 3***Estimated Marginal Means of Perceived dominance**Error bars: 95% CI*

Initially, an exclusion criterion to partake in the study was that participants had to be gymgoers. However, a problem with Prolific occurred which caused 108 participants who did not go to the gym to join the study. When excluding these participants from the data, no significant difference was shown in the results. Therefore, the people who did not go to the gym regularly were kept in the sample to not lose any power. This also showcases the robustness of our results.

### Discussion

This study was designed to get an answer on the research question: “How does grunting during workouts affect their perceived masculinity, social economic status and dominance of the athlete?” The results showed that the first hypothesis, that men who grunt during a workout are perceived more masculine, was not supported. A significant result was found, but in contrary to the hypothesis, the target was perceived as less masculine when he was grunting. The results showed that the second hypothesis, that there would be a significant

difference in perceived SES depending on the experimental condition, was supported. A significant result was found. The target was perceived to be of a lower socioeconomical status when he was grunting. The results showed that the third hypothesis, that men who grunt during a workout are perceived more dominant, was supported. A significant result was found. The target was perceived more dominant when he was grunting.

This study was inspired by the article of Lev and Hertzog (2022). In this article the authors used observations and semi-structured interviews to conduct research on the effect of grunting. Their key findings were that grunting is socially constructed, a rational and voluntary action that is controlled and adjusted to the situation. Since it is a socially constructed behavior, this current study aimed to see what the effect of grunting is on the perception of others. This is the first time an experiment on the phenomenon of grunting in a gym has been done in a social setting. It is important to gain knowledge on phenomena like grunting to broaden the knowledge on how and why people act in certain situations and how people perceive those who act a certain way.

According to Lev and Hertzog (2022) grunting is expected from masculine men. This is the reason that it was hypothesized that grunting would lead to being perceived more masculine. However, the results show the opposite. There are multiple factors that might explain this result. First of all, is it quite likely that, since grunting is a voluntary action, people see men who grunt as men who want to be seen as masculine. This might have an opposite effect on the perception, where men who want to be seen as masculine are seen as less masculine. Another factor might be that people associate grunting with struggling with the weights or people see the target who is not grunting as more stoic and associate that with masculinity. Therefore, people might see a struggling man as less masculine.

The results regarding SES were, however, in line with the hypothesis. There was a significant difference in perceived SES. The target who grunted was perceived as being in a



lower SES. This result is quite interesting. This means that depending on whether a man is grunting in a gym, people perceived him to have a higher or lower social status. This result showcases that very little information about a person can change a person's perception of someone. The reason why people see men who grunt as having a lower SES is unknown. A reason might be that people see grunting as an inappropriate act like burping or shouting in public. This might lead people to view men who grunt, as less socially acceptable and thus as having a lower SES. According to Durante and Fiske (2017), lower-SES people are seen as less competent. Maybe, people see the target who grunts as someone who is struggling and therefore less competent. This could be an underlying factor of why people perceive the target who grunts to be of a lower SES.

The results on perceived dominance also show evidence for the third hypothesis, whether men who grunt are seen as more dominant. This hypothesis was also inspired by the article of Lev and Hertzog (2022), in which the authors argue that grunting among men signifies strength and dominance. The reason for this result might be that by grunting men vocally occupy space in the gym. This could lead to annoyance of other gymgoers, so it might be a good reason for gyms to ban grunting.

### **Limitations and Future Research**

First of all, the aim for the study was to have an exclusion criterion for non-gymgoers. Even though we used a filter, we eventually ended up having a big group of people who do not go to the gym while making recruitment through Prolific. This meant that a big portion of the sample did not go to the gym regularly. To make sure that this did not affect our results, we reran the analysis without those participants. When excluding the non-gymgoers from the results, the results remained the same. This is the reason why people who did not go to the gym were kept in the final analysis. Regardless, in future research there should be an exclusion criterion for non-gymgoers, so only people who go to the gym regularly can

participate in the study. This way all participants are familiar with gym etiquette and the phenomenon of grunting during a workout.

Secondly, there were no regulations set on age. This meant that our sample had a minimum age of 18, a maximum age of 78 and a mean of 42. In this study no attention was given to age. Future research could add age as a dependent variable. This way, the knowledge of how grunting men are perceived could be broadened by whether or not it is impacted by age. It could be that there are different associations with grunting for different age groups or cohorts, but future research is needed on this subject.

Thirdly, the sample of participants consisted of only people from the United Kingdom. This makes the results only applicable on the UK population. Future research could incorporate multiple countries or cultures to see whether this has impact on the results. An example could be to see whether there is a difference of perceived masculinity in grunting depending on whether people are from a masculine or feminine culture.

The sample also only consisted of people who identified as heterosexual. This means that the women who watched the video were attracted to men and the men who watched the video were attracted to women. One might think this would have big effects on the perception of the man in the video, but no significant difference was found between men and women. Although no significant results were found between the two groups, it would be interesting to add another group. Gay men, men who are attracted to other men, could give very different results from the groups in this study.

Another limitation is that the experiment was tested over a screen. In the video, a gym was shown with other gymgoers surrounding the grunting target to make it look like a social setting. However, people who answered the survey were answering using their device, so they were probably not in the gym while answering the questions. People might respond differently when they are actually in the gym or even working out themselves. The

participants also do not know the man in the video personally. People might respond differently if they see the person more often in the gym or if the man is their friend. These limitations are hard to counter in one single future study, but should be taken into account when researching the perception of grunting men.

At last, we only looked at what people's perceptions were of a grunting man. This study did not look into what people think of grunting women during a workout. According Lev and Hertzog (2022) people associate grunting women in the gym with sexual images. Future research could test whether this statement is true. While in this study masculinity was the main focus, in future research the focus could be whether women are perceived more sexual when grunting during a workout.

## **Conclusion**

Men who grunt in the gym during a workout are perceived as less masculine, but as more dominant. Their socioeconomical status is rated lower when they grunt versus when they do not grunt. These different perceptions require further investigation to bring better insights into the perceptions of men who grunt in the gym.

## References

- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychology, 19*(6), 586-592. doi: 10.1037//0278-6133.19.6.586
- American Psychology Association (2013). *Socioeconomic status (SES)*. In American Psychological Association. Retrieved on March 3, 2024 from <https://dictionary.apa.org/socioeconomic-status>
- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology, 42*(2), 155–162. doi; <https://doi.org/10.1037/h0036215>
- Cambridge University Press. (n.d.). *Masculinity*. In Cambridge dictionary. Retrieved March 3, 2024 from <https://dictionary.cambridge.org/us/dictionary/english/masculinity>
- Durante, F., & Fiske, S.T. (2017). How social-class stereotypes maintain inequality. *Current Opinion in Psychology, 18*. 43-48 doi: <https://doi.org/10.1016/j.copsyc.2017.07.033>
- Hertzog, E., & Lev, A. (2019). Male dominance under threat: Machoism confronts female defiance in Israeli gyms. *Journal of Contemporary Ethnography, 48*(6), 836–866. <https://doi-org.proxy-ub.rug.nl/10.1177/0891241619834662>
- Lev, A., & Hertzog, E. (2022). Granting the privilege to grunt: Reconceptualizing the perception of grunting in gyms. *International Review for the Sociology of Sport, 57*(3), 440-457. <https://doi.org/10.1177/10126902211020170>
- McCroskey, J. C., & McCain, T. A. (1974). The measurement of interpersonal attraction. *Speech Monographs, 41*(3), 261–266. <https://doi.org/10.1080/03637757409375845>
- Morales, Z., Owen, S., & O’Connell, D. G. (1999). Vocal disinhibition (grunting) does not increase dead lift force in college athletes or nonathletes. *Perceptual and Motor Skills, 89*(1), 233–234. <https://doi-org.proxy-ub.rug.nl/10.2466/PMS.89.5.233-234>

- O'Connell, D. G., Hinman, M. R., Hearne, K. F., Michael, Z. S., & Nixon, S.L. (2014) The Effects of “Grunting” on Serve and Forehand Velocities in Collegiate Tennis Players. *Journal of Strength and Conditioning Research*, 28(12), 3469-3475.  
doi:10.1519/JSC.0000000000000604
- Rodriguez-Santiago, M., Nührenberg, P., Derry, J., Deussen, O., Francisco, F.A., Garrison, L.K., Garza SF, Hofmann, H.A., & Jordan, A. (2020). Behavioral traits that define social dominance are the same that reduce social influence in a consensus task. *Proceedings of the national academy of sciences*, 117(31), 18566-18573. doi: <https://doi.org/10.1073/pnas.2000158117>
- Sinnett, S., Maglinti, C., & Kingstone, A. (2018). Grunting’s competitive advantage: Considerations of force and distraction. *PLoS ONE*, 13(2): e0192939.  
<https://doi.org/10.1371/journal.pone.0192939>
- Watkins, C.B., Jones, B.C., & DeBruine, L.M. (2010). Individual differences in dominance perception: Dominant men are less sensitive to facial cues of male dominance *Personality and Individual Differences*, 49, 967-971.  
<https://doi-org.proxy-ub.rug.nl/10.1016/j.paid.2010.08.006>
- Zhang, B., Hu, Y., Zhao, F., Wen, F., Dang, J., & Zawisza, M. (2023). Editorial: The psychological process of stereotyping: Content, forming, internalizing, mechanisms, effects, and interventions. *Front Psychol.* ;13:1117901. doi: <https://doi.org/10.3389%2Ffpsyg.2022.1117901>

## **Appendix A: Measurement Items**

### **Scale Item for Aggression**

1. To what extent do you think Jamie is aggressive?

### **Scale Items for Masculinity**

1. To what extent do you think Jamie is masculine?

### **Scale Items for Traditional Male Gender Norms**

1. To what extent do you think the man is assertive?
2. To what extent do you think the man is independent?
3. To what extent do you think the man is ambitious?

### **Scale Items for Social Dominance**

1. This person tends to assert their opinions and preferences in social settings
2. I think this person typically takes on a leadership role in social settings
3. This person maintains control and influence over others in social settings

### **Scale Items for Social Attractiveness (McCroskey & McCain, 1974)**

1. I would like to have a friendly chat with him
2. We could never establish a personal relationship with each other
3. He wouldn't fit into my circle of friends

### **Scale Items for Physical Attractiveness (McCroskey & McCain, 1974)**

1. I think the man is handsome
2. He is not very good-looking
3. I find him very attractive physically

### **Scale Items for Task Attractiveness (McCroskey & McCain, 1974)**

1. I have the feeling that he is a very good weightlifter
2. I have confidence in his ability to give me gym advice
3. If I worked out with him, I would accomplish a lot