Just a Joke? Can Sexist Comedy Harm Women's Cognitive Performance?

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The potential of sexist jokes in comedy to harm women has been a matter of intense public debate. Psychological research on sexist comedy is scarce and inconclusive. Theory on social identity threat suggests that communicating devaluation and negative group stereotypes impairs the performance of members of a targeted group: Do women exposed to sexism in stand-up comedy score worse in subsequent cognitive tasks compared with women's performance after watching nonsexist comedy? In four experiments, we examined women's performance on numerical and figural intelligence subtests after watching sexist comedy as compared with nonsexist comedy. In Experiment 1 ($n = 102$) and Experiment 4 ($n = 81$), the test performance of women who watched sexist stand-up comedy clips suffered. Experiments 2 ($n = 181$) and 3 ($n = 100$) showed mixed evidence (see online supplemental materials). A mini meta-analysis reveals a small but significant negative overall effect ($d = -.27$). Self-reported perceived humor (state) and coping sense of humor (trait) did not consistently moderate the influence of sexist comedy. Insights gained from analyses of emotional responses, assessed both via self-reports and a facial coding software, were limited. We discuss implications for identity-threat theory and for using disparaging humor in comedy.

Keywords: social identity threat, humor, sexism, gender, test performance

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Comedy is a popular genre of the entertaining arts, its origin dating back to ancient Greek playwrights (e.g., Aristophanes, Menander, e.g., Konstan, 1995). Humorous communication often concerns social phenomena, which are commented on in a playful, yet informative way. As an aesthetic form of conveying a message and a creative act in itself, it elicits feelings of appreciation and positive emotions (Weisfeld, 2006). However, as early as in ancient Greek society, Plato and Aristotle suggested that people laugh at the misfortune of others (*Superiority Theory*; Morreall, 1987). From early on, comedy has been criticized for its potentially negative impact on individuals and societies (Plato, 375 BC/1974). Today, sexist humor can be found in songs, TV shows, and movies. There have been intense discussions about comedians who have been condemned for playing around with stereotypes while trying to entertain on college campuses and in mainstream media (e.g., Flanagan, 2015; Marchese, 2019). One theoretical framework that could back a critical stance toward sexist or otherwise disparaging humor is *Social Identity Threat* (e.g., Lewis & Sekaquaptewa, 2016; Spencer et al., 2016; Steele, 1997), suggesting that devaluing a group or making negative group stereotypes salient can impair the ambitions and cognitive performance of members of the negatively stereotyped group. Given that today stereotypes and disparagement of women are often communicated in humorous formats (e.g., jokes, sitcoms, and stand-up comedy), this form of communicating stereotypes could indeed be a source of social identity threat—despite the humorous notion—with negative consequences for women's cognitive performance and identification with male-dominated domains (Appel & Weber, 2017).

The psychological impact of stereotypes in sexist comedy has received little attention by empirical research under the social identity threat framework or otherwise. The aim of the present work was to examine the influence of real-world sexist comedy on women's cognitive performance. Four experiments were conducted (and meta-analyzed) to test the hypothesized threat effect (two of them reported in the text and two in the online supplemental materials). In addition, individual differences in the processing of humor were taken into account as potential moderators. Further, emotional responses were examined as potential moderators and mediators, assessed both via self-report measures and via coded facial expressions, which are reported in detail in the online supplemental materials (https://osf.io/5rtz7/?view_only=18ad9c5dae6e4253908b025a40656f62).

Social Identity Threat and Sexist Comedy

Sexist humor objectifies, stereotypes, victimizes, and degrades an individual because of his or her gender (LaFrance & Woodzicka, 1998). It commonly refers to jokes that are meant to be entertaining and amusing, but portray one sex, usually women, as inferior and lower in performance (Woodzicka & Ford, 2010). Theory and research on social identity threat suggest that when a group is negatively stereotyped or devalued, members of that very group (e.g., women, African Americans, or immigrants) experience stress and increase monitoring of themselves and others (Spencer et al., 2016; Steele, 1997). This reduces working memory capacity, which is then unavailable for any cognitive task. These processes can impair the building of abilities during the learning process, lead to task disengagement, and eventually lower performance in domains that the stereotypes apply to (Appel & Kronberger, 2012). In the long term, social identity threat can lead to disidentification from stereotyped domains and a skewed self-concept (Lewis & Sekaquaptewa, 2016; Steele et al., 2002) as well as negative consequences for personal relationships in the related domain (Martiny & Nikitin, 2019). Explicit sexist behavior (Logel et al., 2009) as well as subtle sexist cues (Adams et al., 2005) can result in social identity threat for women. The concept of social identity threat has large overlaps with the concept of stereotype threat, but is more encompassing: social identity threat includes not only situations in which negative stereotypes against a person's group are communicated (i.e., stereotype threat), but also situations in which a person's group is otherwise despised or generally devalued (Appel & Weber, 2017).

In general, media displays of gender stereotypes such as women having low skills and being inferior to men are still widespread (e.g., Aubrey & Frisby, 2011; Eisend, 2010; Gerding & Signorielli, 2014; Kay & Furnham, 2013; Lauzen et al., 2008; Sink & Mastro, 2017). Previous studies have shown that media content, for instance, TV commercials, political ads, newspaper articles, and clips from TV shows can elicit social identity threat or stereotype threat among disparaged group members (e.g., Saleem et al., 2019; Schmader et al., 2015; Schmuck et al., 2017). A meta-analysis with 33 independent studies revealed a mean effect size of $d = -0.38$ in support of this assumption (Appel & Weber, 2017). For example, watching TV commercials in which women were shown in gender stereotypical roles (e.g., a female college student dreaming of becoming the homecoming queen) led to a decrease in math performance and women's leadership aspirations as compared with a neutral commercial (Davies et al., 2002, 2005). The exposure to recurring signals of nonbelonging and to negative stereotypes over an extended period of time can result in chronic threat (Cook et al., 2012). The frequent stereotypic display of certain groups, such as communicated by sexist jokes in comedy, may contribute to a climate in which women suffer chronic experiences of the threat that is constantly lingering "in the air" (cf. Steele, 1997).

With the replication crisis in psychology, social identity threat and stereotype threat theory have been scrutinized (e.g., Flore et al., 2018; Flore & Wicherts, 2015; Pennington et al., 2019; Stoet & Geary, 2012). This has attracted attention to the circumstances under which the threat experience and related downstream effects can or cannot be observed. Our focus here is on comedy, given that much of the explicitly sexist content in the media can be found in comedy (Gray & Ford, 2013). In stark contrast to the intense debate at U.S. campuses and the potential real-world consequences, little research has focused on the effects of disparagement humor (i.e., humor that depreciates or maligns an individual or social group; Zillmann, 1983) on members of the disparaged group. Remarkably, (media) content that has been used in prior social identity threat studies has barely been humorous, except for one study involving a sexist cartoon (Oswald & Harvey, 2000–2001). The effects of cartoon exposure were nonsignificant overall, but in the absence of the instruction that "men and women perform equally" on the math test, the cartoon *increased* women's math performance. Based on previous social identity threat theory and research, we would, on the contrary, expect sexist comedy to elicit threat and, thus, lead to *decreased* performance. However, the humorous format of comedy could also mitigate social identity threat, as humor has been theorized to effectively alleviate stress responses in performance situations (Ford et al., 2004; see also Freud, 1905/1960).

Depending on the social context, the acceptance and interpretation of sexist humor can vary: sexist jokes are perceived as less acceptable and more offensive in a work context than at a comedy club (Gray & Ford, 2013). (Sexist) humor can be used as a communication tool to demonstrate power, and can be a means, for instance, to preserve patriarchal structures in organizations (Kahn, 1989; see also Brunner & Costello, 2002). In turn, for women, sexist humor creates a hostile environment at work (Fitzgerald et al., 1995). The exposure to sexist humor increases men's level of rape proclivity, sexism, and femininity ideology (e.g., Thomae & Viki, 2013; Wright et al., 2018). It also enhances men's willingness to discriminate against women (Ford & Ferguson, 2004), and reduces their willingness to donate to a women's organization (Ford et al., 2008).

Taken together, the literature on social identity threat suggests that disparagement humor against women—no matter if it is perceived to be funny or not—may potentially lead to threat effects (see Thomae & Pina, 2015), similar to, for example, portraying women in gender stereotypical roles (Davies et al., 2002). However, given the contested nature of social identity threat effects, with meta-analyses confirming them on the one hand (e.g., Nguyen & Ryan, 2008) and failures to replicate them on the other (Flore et al., 2018), more research on sexism in humorous formats is needed.

Humor and Cognitive Performance

In contrast to the predictions based on the social identity threat framework, theory and research on humor suggest that the detrimental consequences of negative stereotypes could be absent in a humorous context. Unlike other mechanisms to cope with a threatening situation, humor may effectively alleviate stress responses (cf. *Relief Theory*; see Freud, 1905/1960), including the stress imposed by encountering negative stereotypes. Freud argued that humor as an adaptive mechanism defends the invulnerability of the ego. Hereby, the threat is cognitively still acknowledged, yet affective responses differ, as humor increases positive affect and the tendency to attribute failure externally (see Geisler & Weber, 2010). Further, research has shown that being exposed to (non-sexist) humorous stimuli before taking a math test can increase

performance by decreasing state anxiety in the performance situation (Ford et al., 2012).

Definitions of humor and what makes things funny vary, both among lay people and scientists. Taking a cognitive approach to humor, *Incongruity Theory* (e.g., Hull et al., 2017; Suls, 1972) suggests that the cause of laughter is the perception (and resolution) of an inconsistency between what people expect to happen (e.g., based on their mental patterns) and what actually happens. A revision of Incongruity Theory, *Benign Violation Theory* (McGraw & Warren, 2010; Warren & McGraw, 2016), proposes that humor is elicited when a situation is simultaneously appraised as a *violation* (e.g., a threat to how one believes things should be) and as *benign* (i.e., it is all right, safe, or acceptable). Such violations include identity threats (e.g., insults; McGraw & Warren, 2014). Other research confirms that humor can be elicited by displays of hostility and disparagement (e.g., McCauley et al., 1983; Zillmann, 1983). Usually, violations are not a reason to laugh; however, if they are perceived to happen in a safe context, for instance, a playful conversation or a stand-up comedy show, which includes cues suggesting that the situation should not be taken seriously, they may produce humor. In that case, violations are not perceived as a threat any more, but as funny (McGraw & Warren, 2010). Applied to sexist comedy, we suggest that an explicit communication of gender stereotypes or of the inferiority of women is a violation. Simultaneously, the stereotypes are communicated in a format that entails cues such as hyperboles, which suggest that what is said is not to be taken seriously and, therefore, acceptable (i.e., benign). As a result, the negative consequences of being exposed to gender stereotypes could be suspended (for related evidence, see Mallett et al., 2016; Woodzicka et al., 2015). However, individuals who do not approve the benign circumstances will not judge the jokes to be funny, while the sexist content remains. Thus, individual differences in responding to sexist humor could moderate its social identity threat effects.

There are some indicators that individual differences in humor may influence the ability to cope with stereotyping content. Individuals who score high on *coping sense of humor*, defined as the tendency to respond with cheerfulness in stressful situations (Martin & Lefcourt, 1983; see also Martin, 1996), responded less anxiously in stressful situations. They appraise exams rather as a positive challenge and engage in more functional attribution styles of success and failure (Kuiper et al., 1993; see also Woodzicka & Ford, 2010). In addition, humor has been shown to be one strategy to cope with social identity threat, specifically (Ford et al., 2004). In that study, participants were informed that an upcoming test was diagnostic of mathematical ability and that it had shown gender differences in the past (threat condition), or participants received no such information (control condition). Although no humorous stimulus was presented, coping sense of humor moderated the effect: women who scored high in coping sense of humor were less affected by the performance-inhibiting effects of social identity threat. They showed less anxiety and better performance in the potentially threatening situation.

The Current Research

With opposing theoretical assumptions based on social identity threat theory on one side and humor research on the other side, it is an open question whether media content that entails gender stereotypes but is communicated in a humorous format leads to negative consequences for members of the stigmatized group, in this case women. On the one hand, based on theory and research on social identity threat, we would expect to find decreased performance and lower domain identification in a sexist comedy as compared with a nonsexist comedy condition. On the other hand, the language used in humor and nonverbal cues give the threatening information conveyed an ironic notion that can make the situation benign. Consequently, comedy that entails gender stereotypes may not elicit social identity threat, if the benign circumstances are recognized; thus, a humorous response may alleviate the threat response. Therefore, it is possible that threat effects are not elicited when stereotypes are communicated in a humorous way.

The present research aims to examine potential social identity threat effects elicited by real-world stand-up comedy. To this aim, female participants were randomly assigned to watch either a comedy clip containing sexist humor or a control comedy clip without sexist jokes. Subsequently their cognitive performance in stereotypically male-dominated domains was assessed. The studies further examined individual differences in humor as predictors of cognitive performance in situations of social identity threat.

Hypotheses

Guided by social identity threat theory, we assumed that women who are confronted with comedy including sexist jokes would perform worse in a cognitive performance test than women who are confronted with nonsexist comedy (Hypothesis 1 – main effect). We expected that women who experience the sexist comedy as more humorous (state) show better performance than women who experience it as nonhumorous (Hypothesis 2 – moderation effect 1). Further, based on Ford et al. (2004), coping sense of humor (trait) was expected to moderate the threat effect, as women who frequently use humor as a coping style were expected to be less affected by social identity threat (Hypothesis 3 – moderation effect 2).

Study Overview

We conducted four lab experiments to examine our hypotheses. In all four experiments, we examined women's cognitive performance after watching a sexist comedy clip versus a control clip containing nonsexist comedy, but with varying designs and stimulus material. Experiments 1 and 4 are reported in the main article, while Experiments 2 and 3 (though inconclusive) are reported in the online supplemental materials to adhere to the complete reporting policy. Experiments 1–3 included perceived humor (state) and coping sense of humor (trait) as potential moderators. Experiments 2–4 also assessed additional moderating and mediating variables to explore the boundary conditions of the effect. Finally, we conducted a meta-analysis of all four experiments to estimate the overall magnitude of the obtained effect. In the article and the online supplemental materials, we follow a full transparency approach, and report all experiments, conditions, and variables examined. All four experiments were conducted in Germany, adhering to local ethical guidelines and data protection policies. Experiments 2 and 4 were preregistered. Preregistration documents, the online supplemental materials, and the material of all

Experiments can be found in the Open Science Framework (https://osf.io/5rtz7/?view_only=18ad9c5dae6e4253908b025a40656f62).

Experiment 1

Stimuli

To induce social identity threat, a 5-min comedy clip of the comedian Mario Barth was used. Mario Barth is one of the best-selling comedians in Germany who regularly includes disparagement humor against women in his stand-up shows, from which we showed one sequence. By making fun of women's shopping behavior and displaying it as their main interest in life, he implies that women are superficial and stupid. A comedy clip of similar length with the comedian Luke Mockridge that did not entail disparagement humor served as the control stimulus. As usual in comedy formats, there was laughter in the background. Stimulus material was pretested with a sample of female students ($n = 17$, repeated measurement) to ensure comparable levels of funniness and familiarity, but differences in perceived sexist humor (one item each, rated on an 8-point scale). All clips were freely available on *YouTube*.[1]

Measures

Perceived Humor

Humor as a state was assessed with an ad hoc *Perceived Humor Scale* (following Swani et al., 2013). Participants evaluated whether they found the clip humorous with six items that were answered on a 4-point scale (e.g., "I found the video funny"; $1 = $ *strongly disagree* to $4 = $ *strongly agree*). After excluding one item (i.e., "I believe the video was making a humor attempt"), internal consistency was excellent, $\alpha = .90$.

Coping Sense of Humor

Humor as a trait was measured with the *Coping Humor Scale* (Martin & Lefcourt, 1983). The scale assesses the tendency to use humor to cope with stressful situations with seven items (e.g., "I can usually find something to laugh or joke about even in trying situations") that are answered on a 4-point scale ($1 = $ *strongly disagree* to $4 = $ *strongly agree*; $\alpha = .67$).

Cognitive Performance

We assessed cognitive performance before (baseline) and after (posttest) watching the comedy. Numerical and figural subtests of the intelligence test *I-S-T 2000 R* (Liepmann et al., 2007) are designed as power tests and start with relatively low difficulty, which then increases. We used 10 items each (i.e., every other item) of Form A (baseline) and B (posttest) of the subtests that include arithmetical problems and figure selection tasks, as math and visual thinking are stereotypically considered male-dominated domains. As Form A and B were conceptualized as pseudoparallel forms, learning effects cannot be ruled out after repeated testing. The test manual proposes 10 min of working time per subtest for both arithmetical problems and figure selection tasks (for 20 items each in the original test); thus, the software was programmed to jump to the next page after exactly 10 min. Participants were not required to answer

all questions. To prevent people who were less motivated or disinterested from moving to the next page before even trying to solve the tasks, the "next"-button was hidden. The performance score (i.e., both subtests taken together) was corrected for guessing by subtracting the number of incorrect answers from the number of correct answers, for both points of measurement. Thus, negative scores were possible.

Participants and Procedure

An a priori sample size calculation (G*Power; Faul et al., 2007) for both main effects (between: comedy sexism; within: time of performance measurement) and the interaction effect was conducted. Based on the assumption of medium-sized effects ($f = 0.25$ with $\alpha = .05$ and $1-\beta = .80$) and an estimated correlation of repeated measures of $r = .60$, a sample size of 104 participants was required for the between subjects effect, 34 participants were required for the within subjects effect, and 28 participants were required for detecting the interaction. We aspired the largest of the three required sample sizes.

The study was conducted in a pre-post control study design in a laboratory with a male research assistant. Interaction with the assistant was minimal, as the study was executed on a computer using a survey software. The cover story explained that the current study examines the association between media use and the ability to concentrate. Out of $n = 109$, seven records had to be excluded because the participants could not complete the study because of technical difficulties and external disturbances. The final sample consisted of $n = 102$ female undergraduates (age: $M = 21.70$, $SD = 2.33$, range $= 18–27$ years), who received course credit for their participation.

First, participants completed the Coping Humor Scale. Then, a first subset of items of the numerical and figural subtests of the intelligence Test I-S-T 2000 R was administered (baseline). Next, participants were randomly assigned to watch one of the two videos (sexist vs. nonsexist) and rated how humorous they perceived the comedy. Afterward, participants worked on a second subset of items of the numerical and figural subtests of the intelligence Test I-S-T 2000 R (posttest). Finally, demographic data were collected and participants were asked about the suspected purpose of the study. Participants were thoroughly debriefed. In total, the study took about 40 min.

Results

Main Effect of the Treatment on Cognitive Performance

The results suggest that sexist comedy impaired test performance (see Figure 1: sexist condition: $n = 52$, $M_{baseline} = 5.06$, $SD_{baseline} = 5.63$, $M_{post} = 2.15$, $SD_{post} = 6.58$; control condition: $n = 50$, $M_{baseline} = 5.94$, $SD_{baseline} = 5.92$; $M_{post} = 6.00$, $SD_{post} = 6.03$). A 2 (point of measurement, repeated) $\times$ 2 (treatment) analysis of variance (ANOVA) yielded a main effect for point of measurement, $F(1, 100) = 4.44$, $p = .038$, $d = .42$, and a

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[1] Detailed information on the stimulus material is provided in the online supplemental materials. All video clips used in this research can be requested from Silvana Weber (i.e., videos, transcripts, and English translations).

Figure 1

Interaction Between Point of Measurement and Video Condition (Control versus Sexist Comedy) in Experiment 1 (Left Panel) and Experiment 4 (Right Panel)
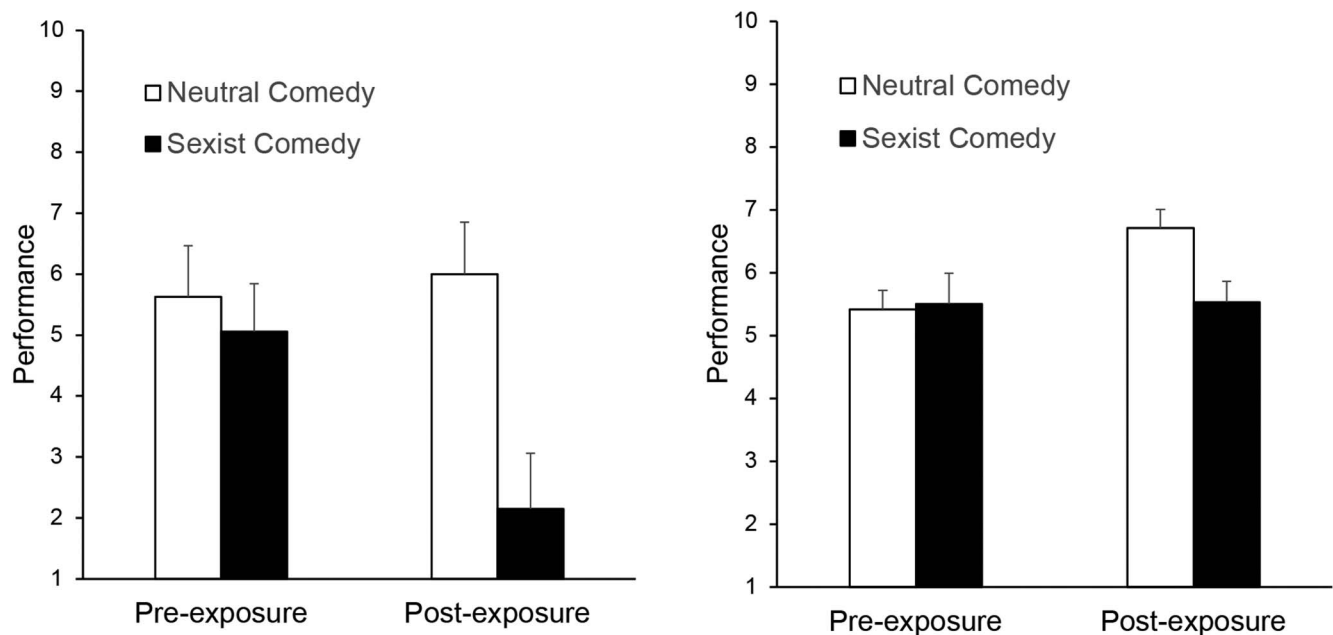
significant interaction between point of measurement and video condition, $F(1, 100) = 4.83$, $p = .030$, $d = .44$.[2] Participants in the sexist comedy condition showed a decrease in performance, $p = .003$, 95% confidence interval (CI) [1.03, 4.78], whereas participants in the neutral comedy condition did not, $p = .950$, 95% CI [−1.97, 1.85].

Preliminary Analyses of Humor Variables

Contradicting the pretest of the stimulus material, the neutral video was perceived to be funnier than the sexist video, t_{Welch} $(83.04) = 4.24$, $p < .001$, $d = .85$. Remarkably, there was more variance in the sexist condition ($M = 2.78$, $SD = 0.88$) than in the control condition ($M = 3.40$, $SD = 0.56$), Levene's test: $F = 15.11$, $p < .001$. Coping sense of humor did not differ between conditions, $t(100) = 0.89$, $p = .375$, $d = .18$. Both humor variables, state and trait, were unrelated for the total sample, $r = .05$, $p = .64$, and in both the control, $r = .02$, $p = .90$ and the sexist comedy condition, $r = .00$, $p = .99$.

Moderation of Perceived Humor (State)

All moderation analyses were conducted with the PROCESS-macro by Hayes (2013), using Model 1 (10,000 bootstraps). Treatment (dummy coded) and perceived humor (z-standardized) as well as the interaction between both variables served as predictors for difference scores of the cognitive performance measure. The interaction was nonsignificant, $B = 2.21$, $SE_B = 1.34$, $p = .10$, 95% CI [−0.45, 4.87], but we still explored the data pattern. In partial support of the hypothesis, more perceived humor predicted better performance in the sexist video condition (simple slope: $B = 2.81$, $SE = 0.95$, $p = .004$, 95% CI [0.93, 4.69]), but not in the

neutral video condition (simple slope: $B = 0.61$, $SE = 0.95$, $p = .52$, 95% CI [−1.27, 2.49]).

Moderation of Coping Sense of Humor (Trait)

A comparable analysis as above indicated that coping sense of humor (z-standardized) did not moderate the effect of the comedy clip, nonsignificant interaction: $B = 0.68$, $SE_B = 1.39$, $p = .62$, 95% CI [−2.08, 3.44].

Discussion

This study examined the social identity threat effect among women if confronted with sexist comedy (vs. nonsexist comedy). Humor scores (state and trait) were included as potential moderators, to explore the boundary conditions of the effect. Connecting social identity threat with humor research, we used humorous real-world stimulus material that contained either sexist or neutral jokes. Change scores from baseline suggest that women performed worse on a set of cognitive tests after exposure to comedy with sexist jokes than women exposed to comedy without sexist jokes. Watching sexist comedy led to a drop in performance whereas the performance remained unchanged in the control condition, with a small to medium effect for the interaction (Cohen, 1988). In contrast to findings of previous research (Ford et al., 2004), coping sense of humor and perceived humor did not moderate the effect.

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[2] This result includes seven participants who were suspicious of the experiment's goal and remarked a potential link between the sexist comedy and performance, as indicated in the debriefing question. Comparable results were obtained when these participants were excluded: main effect, $F(1, 93) = 6.16$, $p = .015$, $d = .51$; interaction, $F(1, 93) = 6.59$, $p = .012$, $d = .53$.

Even though the interaction was not significant, the simple slopes suggest that the funnier the sexist video was perceived, the smaller was the drop in performance from pre- to postassessment. This indicates that perceiving sexist jokes as funny might alleviate the threat that they pose on women's gender identity. This finding is in line with Benign Violation Theory (McGraw & Warren, 2010), suggesting that something threatening (i.e., a violation) that is simultaneously judged as safe (i.e., benign), can be perceived as funny, and in turn, mitigate the threat response. Replicating the finding with other stimuli was deemed to be important.

Experiments 2 and 3

A new clip by a third comedian (called Hape Kerkeling) was added for the control conditions in Experiments 2 and 3 to arrive at similarly funny clips. Thus, Experiment 2 included two control conditions: the control video that had been used in Experiment 1 (Luke Mockridge) was, again, considered funnier than the clip in the experimental condition, and the new control video (Hape Kerkeling) was rated comparably funny as the experimental video. However, in Experiment 3, the two used clips (experimental video: Mario Barth; control video: Hape Kerkeling) differed regarding perceived funniness. Furthermore, in hindsight, we realized that the new control clip implemented in Experiments 2 and 3 could have subtly introduced gender-related social identity threat as well, as it may have been perceived to contain subtle disparagement humor (see online supplemental materials for details on the stimulus material). In line with this thought, performance in that control condition resembled performance in the experimental condition. Because of this ambiguity that makes the findings inconclusive, we report those experiments in the online supplemental materials, adhering to a full-disclosure policy. The results of the two experiments were also included in our mini meta-analysis reported below.

Experiment 4

The main aim of Experiment 4 was extending our findings to different sexist and nonsexist comedy clips. To obtain closer experimental control, two clips by the same comedian were selected after pretesting. Comedy by the comedian Luke Mockridge was shown to examine whether sexist jokes by a comedian rated popular in the target group can induce social identity threat. Additionally, we aimed at testing whether findings supported the hypothesis that emotional reactions, measured via self-reports, mediated the threat effect. No indirect effects were found (see online supplemental materials for details). Moreover, to further examine the boundary conditions of the threat effect, the roles of two potential moderators were explored, that is, gender identification (Schmader, 2002) and endorsement of benevolent sexism, confining women to traditional social roles (i.e., agreement with statements such as "Women should be cherished and protected by men"; Glick & Fiske, 1996). Findings were inconclusive, with no evidence obtained supporting the hypotheses, and are reported in the online supplemental materials. This study was preregistered at aspredicted.org (https://aspredicted.org/2sy4w.pdf).

Stimuli

Two different video clips by the same comedian (Luke Mockridge) were used for the sexist and the control condition. The clips were pretested, ensuring comparable levels of perceived funniness and differences in perceived sexism. In the sexist condition, women are objectified and devalued by focusing on their visual appearance. Further, a description of women's behavior during a date implies them being naive and superficial.

Measures

Cognitive Performance

A different numerical subtest (i.e., completing numerical series) of the I-S-T 2000 R was used (Liepmann et al., 2007). The 20 items of Form A were split up by every other item; thus, participants were asked to complete 10 items before and 10 items after watching the comedy clip. Because of repeated testing, learning effects are possible. Participants had 5 min per set to complete the task. Additionally, they were provided with a piece of paper to take notes.

Emotional Reaction, Gender Identification, and Benevolent Sexism

Details on these measures can be found in the online supplemental materials.

Participants and Procedure

The same a priori sample size calculation (G*Power; Faul et al., 2007) as in Experiment 1 applies. In total, $n = 102$ women participated, of which 21 were excluded (15 from the sexist and six from the control condition), because they reported that they knew the shown video clip, which in this case might have severely influenced the effect.[3] Therefore, data of $n = 81$ women (age: $M = 23.42$, $SD = 3.43$, range $= 18$–36 years) were analyzed (sexist condition: $n = 36$; control condition: $n = 45$). A sensitivity analysis (G*Power; Faul et al., 2007) shows that the effect size that could be detected regarding the focal between by within interaction (given $n = 81$ participants, $\alpha = .05$ and $1\text{-}\beta = .80$, $r = .60$ for the correlation between the repeated measures) amounts to $f = 0.14$. Thus, we were able to identify an interaction effect of small-to-medium size.

The experiment was conducted in a pre-post control study design in a laboratory with a female research assistant. The same cover story was used as in Experiment 1. Participants received either course credit or a small monetary compensation. After completing the first subset of the cognitive performance test, participants were randomly assigned to watch either the sexist or the neutral comedy clip. Afterward, the second subset of the performance test was completed, followed by the evaluation of the emotional reaction and the assessment of gender identification and benevolent sexism. Additionally, demographic data (i.e., age, gen-

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[3] The full original clip ended with a very positive portrayal of women, which we had cut for the purpose of this study. All patterns of findings are comparable in the analyses including the total sample: main effect, $F(1, 100) = 23.98$, $p < .001$, $d = 0.98$; interaction, $F(1, 100) = 6.38$, $p = .013$, $d = 0.51$.

der, sexual orientation, and occupation), as well as familiarity with and attitude toward the comedian and the shown clip were assessed (binary answer format). Among the participants, 78% stated they generally liked the comedian. Finally, participants were thanked and debriefed. The study took about 25 min.

Results

Manipulation Checks

One-item manipulation checks showed that the participants did not consider the videos significantly different in funniness (5-point scale from $1 = not funny at all$ to $5 = very funny$; sexist condition: $M = 3.28$, $SD = 1.19$; control condition: $M = 3.69$, $SD = 1.13$), $t(79) = 1.60$, $p = .12$, $d = 0.35$. Yet, the sexist video was rated more sexist (5-point scale from $1 = not sexist at all$ to $5 = very sexist$; $M = 3.19$, $SD = 1.24$) than the control video ($M = 1.44$, $SD = 0.66$), $t_{Welch} (50.60) = -7.66$, $p < .001$, $d = 1.76$. Perceived funniness and perceived sexism tended to be negatively correlated, $n = 81$, $r = -.22$, $p = .052$.

Main Effect of the Treatment on Cognitive Performance

The results indicate an effect of the experimental condition on postcomedy performance (sexist condition: $M_{baseline} = 5.50$, $SD_{baseline} = 2.97$, $M_{post} = 5.53$, $SD_{post} = 2.95$; control condition: $M_{baseline} = 5.42$, $SD_{baseline} = 2.44$; $M_{post} = 6.71$, $SD_{post} = 2.94$). A 2 (point of measurement, repeated) × 2 (treatment) ANOVA yielded a main effect of point of measurement, $F(1, 79) = 9.92$, $p = .002$, $d = .71$, and the expected significant interaction between point of measurement and video condition, $F(1, 79) = 9.10$, $p = .003$, $d = .68$. Data suggest a negative effect of exposure to comedy with sexist jokes on performance (see Figure 1): participants in the control condition showed a pre-post increase in completing the numerical series test, $p < .001$, 95% CI [0.73, 1.84], whereas participants in the sexist comedy condition did not, $p = .93$, 95% CI [−0.59, 0.65]. Put differently, women's cognitive performance was more negative after watching sexist comedy than the control clip, $F(2, 78) = 9.21$, $p = .003$, $d = .69$ (controlling for preexposure performance).

Discussion

The results of Experiment 4 confirm our main hypothesis. Women in a control comedy condition outperformed women, who were exposed to sexist comedy. The cognitive test we used differed from the one used in Experiment 1; we found higher post-versus pretest scores in the control condition (i.e., a learning effect), whereas the scores in the sexist comedy condition remained nearly unchanged. As stated above, because of the pseudoparallel forms such learning effects can occur. We argue that these effects were inhibited in the threat condition.

From a methodological point of view, using two video clips of the same comedian for both the sexist and the control condition eliminated some interpretation problems. Additionally, as research has found, inducing social identity threat through subtle cues can be more detrimental for women's performance than explicit cues (Nguyen & Ryan, 2008). Opting to use a comedy clip from Luke Mockridge for the sexist condition, who is generally known to be less offensive in comparison with Mario Barth, whose sexist jokes

are very blatant, may have resulted in more intense threat effects (see Discussion). The findings also demonstrate that participants' overall liking of a comedian who uses disparagement humor (among other sorts of jokes) does not eliminate the sexist comedy's damaging effects.

Mini Meta-Analysis

Our central goal was to examine the impact of sexist comedy (vs. nonsexist comedy) on the cognitive performance of women. As the results of the four experiments differed in that respect (for Experiments 2 and 3 see online supplemental materials), we meta-analyzed the data to get a clearer picture (see Goh et al., 2016). All four experiments entailed one group that was exposed to a sexist comedy clip and one or two groups that were exposed to a nonsexist comedy clip. Cognitive performance served as a dependent variable across experiments (but operationalizations varied as indicated).

The mini meta-analysis followed the recommendations by Goh and colleagues (2016). We used the software *Comprehensive Meta-Analysis* (Borenstein et al., 2005) to conduct the analysis. Cohen's d was chosen as the effect size metric and we used the fixed effects model. For Experiments 1, 2, and 4, data on pre- and postexposure performance were entered, for Experiment 3 only postexposure performance scores were available. The results of both control conditions in Experiment 2 were pooled. Across all experiments, the difference between the sexist and the nonsexist condition amounted to $d = -.27$, 95% CI [−.459, −.081], $p = .005$. Taking together the results from our four lab experiments ($n = 464$), this finding indicates that cognitive performance was impaired by being exposed to sexist (vs. nonsexist) comedy.

General Discussion

In recent years, sexism in comedy has become a contested issue. One of the arguably most relevant questions regarding sexist comedy is the question of its psychological effects. What are the consequences of being exposed to sexist comedy? Prior research has shown that sexist jokes may increase men's hostility toward women (Ford et al., 2015). Yet, previous research has put little emphasis on women and their behavior after being exposed to sexist jokes. The current series of studies addressed this research lacuna from a social identity threat perspective. This work advances theory and research on social identity threat by combining it with humor research (i.e., Benign Violation Theory) and, thus, extending the phenomenon to a new and relevant applied context. Our investigation contributes to prior theory and research on sexist humor and to media-elicited threat effects. The studies profit from an experimental design, allowing us to draw causal conclusions. We conducted four experiments to test the assumption that sexist comedy undermines women's cognitive performance—and we examined the role of humor. Social identity threat effects were obtained in Experiment 1 and Experiment 4, while Experiments 2 and 3 yielded null results (see online supplemental materials). Because results varied across the four experiments, a mini meta-analysis was conducted. This meta-analysis suggests that—overall—watching sexist comedy impaired women's cognitive performance on stereotypically male-associated tests.

Social identity threat has become a controversial topic in recent years (e.g., Flore et al., 2018; Flore & Wicherts, 2015; Stoet &

Geary, 2012). A major next step in this research program is to test the theory in fields of theoretical and applied relevance. In our experiments, we found support for our assumption of social identity threat effects because of sexist comedy exposure. However, the results were heterogeneous across studies, and the average effect sizes were small. The null findings in Experiments 2 and 3 could either be because of an unlucky choice of control conditions, or alternatively, another demonstration that social identity threat effects are hard to replicate. Therefore, we perceive our findings as a starting point for future research, rather than an end point. The potentially detrimental effects of sexism in comedy and other entertaining arts has received far less attention in experimental research than warranted, given the heated public debate.

The Ambivalent Role of Humor

Humor may play an ambivalent role in the context of sexism. While it is an aesthetic form of communication on the one hand, it may, on the other hand, also be perceived to downplay the severity of the content. The presented comedy clips included unexpected and abrupt shifts in perspective, which elicit laughter (cf. Incongruity Theory). However, not everyone may acknowledge the humor in stereotypic presentations of women, as displayed by Mario Barth (Experiments 1–3) or Luke Mockridge (Experiment 4). Therefore, based on Benign Violation Theory, we focused on humor as a way to cope with potentially threat eliciting, sexist, yet humorous media content. The tongue-in-cheek communication of comedy imparts that the sender of the message distances him or herself from the content. Recipients may consider that the protagonists or media professionals involved do not actually believe in the stereotype, which makes the situation benign, and thus, may not provoke a threat response. Yet, if the benignancy of the situation is not recognized by the recipient, the stereotypic display of women may bear a threat to in-group members (i.e., female recipients). Thus, the individual difference variables coping sense of humor (trait) and perceived humor (state) were included as potential moderators.

We could not replicate the finding by Ford and colleagues (2004), as coping sense of humor did not moderate the threat effects. Notably, the reliability of the scale was relatively low across studies. Finding a better way to assess humor as a coping style should be an objective of future research. In the given context, other humor styles, such as self-enhancing or self-defeating humor (as assessed in the *Humor Styles Questionnaire*; Martin et al., 2003) might give broader insight into the role of trait humor in potentially threatening performance situations. Additionally, further explorations of individual differences in how individuals perceive and respond to sexist comedy may provide deeper insight into its potential detrimental effects. It stands to reason that people who self-select to watch humor that disparages their group are less likely to experience threat effects, as they acknowledge the benign situation. However, in the current research, participants did not self-select whether they wanted to view sexist or nonsexist comedy, because they were randomly assigned to the experimental conditions. Benevolent sexism was considered as a potential moderating factor in Experiment 4. The results align with previous research that showed that people who are high in sexism report a higher appreciation of sexist humor (e.g., Eyssel & Bohner, 2007; Greenwood & Isbell, 2002), such as women with high levels of benevolent sexism did not experience a threat effect. This exploratory finding should be taken into account in future research.

In line with findings of previous research, perceived humor (state) predicted cognitive performance in Experiment 1, suggesting that the funnier women perceived any of the presented comedy clips (independent of experimental condition), the better they performed in a subsequent test. This result was replicated in Experiment 3, but not in Experiment 2. However, the results of the moderation analyses of perceived humor were inconclusive. Even though the interactions were not significant in Experiment 1 (and in Experiment 3), the simple slopes revealed that in the sexist comedy condition in Experiment 1 (and a similar tendency in Experiment 3), the drop in performance was reduced if the comedy was perceived as funny. This pattern of results could not be replicated in Experiment 2. Despite using advanced measurements to assess emotions (i.e., a software-based analysis of facial expressions, see online supplemental materials), Experiment 3 could not shed light on the complex relationship between perceived humor and performance. Including other emotions into the model also did not contribute to a clearer picture, neither as moderators (Experiment 3) nor as mediators (Experiment 4).

Limitations and Future Research Directions

A first limitation pertains to culture. The current studies were conducted with German speaking, female university students. Replications in other countries, with different samples, and with a larger variety of comedians are encouraged. While men might show social identity threat effects after being exposed to sexist comedy against men, they could also experience reversed effects after watching sexist comedy against women (i.e., *stereotype lift*; see Appel & Weber, 2017). Examining cognitive consequences of sexist comedy for men could rule out alternative explanations of our results such as priming effects.

As usual in lab experiments, we can only provide evidence for the general existence of the effect in a rather artificial situation (i.e., taking a cognitive performance test after watching comedy). It remains open how much exposure is necessary to undermine women's motivation or domain identification in general, and how long-ranging the effect might be. Similarly, one would need to systematically test which aspects of cognitive performance suffer and which do not.

Another limitation is the use of different comedians for the sexist versus nonsexist comedy conditions. On the one hand, both comedians presented in Experiment 1 won the recognized German Comedy Award and are established comedians in the German media. On the other hand, however, they also differ in several respects, most importantly, regarding the type of comedy that they are known for. Mario Barth, who is widely known since the 2000s, is popular as a comedian who jokes about gender stereotypes, as the titles of his shows already suggest (e.g., "Men are primitive, but happy," 2006). In contrast, Luke Mockridge is a younger comedian, who entered the public comedy stage in the 2010s. In his shows, he talks about growing up in the 1990s and uses rather puerile humor. That being said, using clips of different comedians (Experiments 1–3) involved various sources of variance. This problem was resolved in Experiment 4 by using the same comedian for both the sexist and the nonsexist comedy condition.

Despite using sophisticated methods beyond self-report measures (see online supplemental materials), we could not clarify the role of state humor. If humor really reduced the negative influence of sexism and alleviated the threat that the violation poses, cognitive performance should be better after hearing funny sexist jokes as compared with unfunny sexist jokes. Instead of measuring individual differences in the humor response, funniness could be experimentally manipulated to examine the causal influence of humor. Further, a baseline condition in which participants watch a nonfunny instead of a funny video in between the pre and postmeasures could clarify matters. On a related note, some research has compared the perception of derogatory humor with that of the same statements in the absence of humor. It was examined whether jokes were rated more offensive and confrontation-worthy than statements with the same content. Sexist statements were perceived as more offensive than sexist jokes (Woodzicka et al., 2015). Similarly, future research on social identity threat should compare humorous versus nonhumorous disparagement. Whereas the latter control condition is desirable to test whether humor can mitigate the effect of sexist content, it would be hard to design a satisfactory control condition comparable with the comedy clips we presented. Future research following up on our set of studies could instead use jokes to test whether exposure to them leads to less detrimental effects than the same content conveyed in a nonhumorous fashion. This would be important evidence concerning Benign Violation Theory, to assess how humorous disparagement may be different from nonhumorous disparagement. However, for the present purposes, it was sufficient to demonstrate that sexism, though presented in comedy, can impair women's cognitive performance.

Some jokes in the real world focus on stereotypes that are closely related with potential dependent variables of cognitive performance (e.g., women are bad at math and cannot think logically), whereas other jokes express a general devaluation of women (e.g., sexual objectification). In our studies, we only included the latter and, thus, rather focused on social identity threat, while the former might target more concretely stereotype threat. Based on theory and research, we assume that both types of sexist jokes may impair women's cognitive performance, yet future research is needed to extend the findings by examining different joke content.

Evidence suggests that sexist jokes are better accepted when a member of the depreciated group tells them (Ford, 2000; Thai et al., 2019). Based on Benign Violation Theory, the gender of the comedian (i.e., the communicator of the sexist comedy) could affect whether the situation is considered more or less benign, and thus, influence the level of disparagement and threat elicited by the stimulus. We assume that watching a female comedian telling sexist jokes would not impair performance to the same extent as a male comedian telling sexist jokes. However, this remains speculative. In this context, it should also be considered that men are stereotypically considered funnier than women, even though empirical findings on this matter are controversial (meta-analysis by Greengross et al., 2020; see also Hooper et al., 2016; Mickes et al., 2012).

Conclusion

Overall, four studies including 464 female participants, suggest that watching sexist comedy can impair women's cognitive performance as compared with nonsexist comedy. We showed that

this applies to situations in which a cognitive performance test is given right after being confronted with sexist comedy. Going beyond this situational approach, reiterating sexist jokes in the media or on live comedy stages could contribute to an overall sexist climate that could have further detrimental consequences for women (i.e., chronic threat effects, spillover effects). Any public discussion on the boon or bane of using stereotypes in comedy (e.g., Flanagan, 2015; Marchese, 2019) can profit from empirical research examining its influence both on members of the group that is made fun of and others. The present findings suggest that sexist humor can have manifest negative consequences on those made fun of, even if the performance is meant to be just funny and entertaining.

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