

Social Identity Threat in Interpersonal Relationships:
Activating Negative Stereotypes Decreases Social Approach Motivation

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Word count: 8312 words (text, footnotes, and graphs excluding abstract, public significance statement, references, and supplemental material)

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Acknowledgments

We thank our students and research assistants Silvia Bettinaglio, Sarah Hoppler, Ilkim Kilinc, Isabella Maura, and Elisa Pfeiffer for their help with the data collection.

Abstract

Research has shown that social identity threat can have a broad variety of negative consequences. However, not much is known about the consequences of social identity threat on interpersonal relationships. In the present research, we hypothesize that experiencing social identity threat decreases people's social approach motivation towards other people related to the stereotyped domain. Specifically, we manipulated social identity threat by activating negative stereotypes about women in math. As math is an important aspect of the academic self-concept, female university students who are confronted with a negative math stereotype should experience threat towards their identity as university students. We then tested whether this threat affected female students' motivation to approach other university students and whether the effect was mediated by a reduced sense of belonging to the university. Data from 478 participants, assessed in three experimental (Study 1a: $N = 79$, Study 1b: $N = 164$; Study 2: $N = 100$) and one correlational study (Study 3: $N = 135$), mainly supported these hypotheses. We conclude that social identity threat can be detrimental to the quality of people's social lives.

Keywords: social identity threat, social approach motivation, sense of belonging, gender stereotypes

Word count: 180 words

Public Significance Statement

This article shows that when an individual's competence is threatened by reminding them of a negative group stereotype (e.g., females being reminded of the stereotype that women do worse in math than men in university studies), this can reduce their motivation to approach people related to the stereotyped domain (e.g., other university students). This reduced motivation is important as it may not only have detrimental consequences for people's social lives, but also for their success in these domains (e.g., women might form fewer professional

networks).

Social Identity Threat in Interpersonal Relationships:

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Most people belong to a large number of different social groups. Social identity theory (Tajfel & Turner, 1979) states that people are motivated to regard the groups they belong to (i.e., ingroups) positively because the value of an important social group reflects back on people's self-esteem. However, situations may arise in which the positivity of a social group is threatened. Social identity threat is defined as the concern people have in situations in which the positive image of their ingroup is threatened by the activation of negative group stereotypes, or by the devaluation or stigmatization of the ingroup (Steele, Spencer, & Aronson, 2002). Previous research has shown that social identity threat in the form of negative stereotypes in a particular domain (e.g., negative stereotypes about women in math) can contribute to the maintenance of inequality within societies by impairing the performance of negatively stereotyped groups such as women (e.g., Murphy, Steele, & Gross, 2007; Schmader, 2002), older people (e.g., Hess, Auman, Colcombe, & Rahhal, 2003), immigrants (e.g., Appel, Weber, & Kronberger, 2015; Froehlich, Martiny, Deaux, Goetz, & Mok, 2016; Martiny, Mok, Deaux, & Froehlich, 2015), and people with low socio-economic status (Croizet & Claire, 1998; Spencer & Castano, 2007). In addition, experiencing social identity threat in the form of negative stereotypes in a particular domain has been shown to increase people's avoidance of, disidentification with, and disengagement from the stereotyped domain (e.g., Hall, Schmader, & Croft, 2015; Holleran, Whitehead, Schmader, & Mehl, 2011; Woodcock, Hernandez, Estrada, & Schultz, 2012). Thus, experiencing social identity threat impairs the relationship between a threatened person and the targeted domain, and has negative consequences such as impaired performance and a reduced feeling of acceptance and belonging to the domain (e.g., Good, Rattan, & Dweck, 2012; Hall et al., 2015; Walton & Cohen, 2007). However, not much is known about the consequences of social identity threat

on interpersonal relationships; thus, the question arises as to whether social identity threat may impair not only the attitudes of a targeted person towards a stereotyped domain, but also towards people who are associated with the related domain. In the present work, we address this question by testing the effects of social identity threat on people's motivation to approach positive social interactions with other people who are associated with the negatively stereotyped domain. Specifically, we test whether female university students who are confronted with a negative stereotype that threatens their academic self-concept are subsequently less motivated to seek positive social relationships with other university students.

Consequences of Social Identity Threat

As outlined earlier, one form of social identity threat is the activation of negative stereotypes in achievement-related situations. This effect, named stereotype threat, has been shown in numerous studies for different groups and domains (e.g., Blascovich, Spencer, Quinn, & Steele, 2001; Croizet & Claire, 1998; Hess et al., 2003; Hively & El-Alayli, 2014; Inzlicht & Schmader, 2012; Martiny et al., 2015; Murphy et al., 2007; Schmader, 2002; Spencer & Castano, 2007; Steele & Aronson, 1995; Stone, Lynch, Sjomeling, & Darley, 1999). For example, activating negative stereotypes about women's performance in math can decrease women's performance in subsequent math tests compared to a control group with no stereotype activation (e.g., Dar-Nimrod & Heine, 2006; Good, Aronson, & Harder, 2008; Keller, 2002; Murphy et al., 2007; Schmader, 2002; Schuster, Martiny, & Schmader, 2015; Spencer, Steele, & Quinn, 1999; for an overview see Logel, Peach, & Spencer, 2012).

Beyond performance, social identity threat can increase avoidance, disidentification, and disengagement from the related domain (e.g., Holleran et al., 2011; Woodcock et al., 2012). For example, a longitudinal study of undergraduate ethnic minority science students revealed that experiencing social identity threat repeatedly led to these students disidentifying

with the scientific domain, and this disidentification reduced their intention to pursue a scientific career (Woodcock et al., 2012). Hall and colleagues (2015) used a daily diary methodology to investigate experiences of social identity threat among male and female engineers. Results showed that women reported greater social identity threat on days when their conversations with male, but not female, colleagues cued feelings of incompetence and a lack of acceptance. One consequence of these daily variations in social identity threat was mental exhaustion and psychological burnout.

So far, this research has focused exclusively on people's relationships to the domain itself (often their professional work). For example, the studies by Holleran et al. (2011) and Hall et al. (2015) used a measure of job disengagement (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) that contained items such as "Lately, I tend to think less during my work and just execute it mechanically" and "I get more and more engaged in my work" (reverse coded; see Holleran et al., 2011, p. 67). These items assess how people feel and act towards their work in the stereotyped domain and do not include social relationships with other people associated with the domain, such as colleagues. In the present work, we extend this earlier research by shifting the focus from the consequences of social identity threat on the relationship between the person and the domain to the consequences of social identity threat on the relationship between the person and other people in the targeted domain. It seems reasonable that if a person disidentifies with a domain, this disidentification would spread to the people associated with the domain. However, so far, no empirical evidence has been provided for this claim. Furthermore, other scenarios are also possible: For example, a female student dropping out of her engineering major might still spend leisure time with her former classmates and have positive attitudes towards interacting with this friend group. However, in the present work we argue that experiencing social identity threat can not only negatively affect the attitudes threatened individuals have towards a specific domain, but also hamper

their interpersonal relationships as it decreases their motivation to pursue positive social interactions (i.e., social approach motivation) with people associated with the stereotyped domain.

Effects of Social Identity Threat on Social Approach Motivation

Social relationships are essential for psychological and physical health (Umberson, Crosnoe, & Reczek, 2010). In fact, social integration can be considered a basic psychological need (Baumeister & Leary, 1995). One important predictor of establishing satisfying social relationships is social approach motivation (i.e., the motivation to approach positive social outcomes such as acceptance, social integration, and love; Gable & Berkman, 2008; Mehrabian, 1994). Social approach motivation enhances exposure to positive social events by creating opportunities and taking advantage of potentially rewarding social interactions (Gable, 2006). This is important because positive social encounters do not simply happen; they must be actively approached (Elliot, Gable, & Mapes, 2006). In line with this rationale, people with high levels of social approach motivation experience more positive social encounters (Gable, 2006; Nikitin, Burgermeister, & Freund, 2012) and are more liked by others than people with lower levels of social approach motivation (Nikitin & Freund, 2015). Furthermore, research shows that social approach motivation predicts people's positive social behavior in interpersonal interactions (e.g., Nikitin & Freund, 2010, Study 2). Consequently, high social approach motivation is associated with higher subjective well-being, lower levels of loneliness, and more satisfaction with social bonds (Gable, 2006; Mehrabian, 1994; Nikitin et al., 2012).

In the present work, we argue that experiencing social identity threat reduces social approach motivation towards individuals associated with the threatened domain. One reason for the reduced motivation to approach positive social interactions after dealing with social identity threat might be people's reduced sense of belonging to relevant groups. Earlier

research has shown that social identity threat in the form of stigmatization increases targeted group members' uncertainty about their social belonging in mainstream institutions like school and work (Walton & Cohen, 2007). Because their group is often marginalized, "they may be unsure of whether they will be fully included in positive social relationships in these settings" (Walton & Cohen, 2011, p. 1447). For example, a stereotypical classroom environment in computer science courses lowered girls', but not boys', sense of belonging in the course (Master, Cheryan, & Meltzoff, 2016). Another study showed that the message that women have lower mathematical ability than men eroded women's, but not men's, feelings of membership and acceptance in the math domain (Good et al., 2012; for an overview of this research see Walton & Carr, 2012). Based on earlier research showing that positive social outcomes, such as sense of belonging, are the focus of social approach motivation (for summaries see Gable & Berkman, 2008; Nikitin & Schoch, 2014), we argue that a reduced sense of belonging will reduce social approach motivation, potentially because sense of belonging is an indicator of one's likelihood of attaining positive social outcomes (Geen, 1991). Thus, we argue that social identity threat reduces social approach motivation and that this effect is mediated by lower levels of sense of belonging.

The Present Research

Four studies tested the prediction that social identity threat leads to reduced social approach motivation towards people associated with the threatened domain. We tested this prediction for female university students by activating the negative performance-related stereotype that women have lower mathematical ability than men. Based on the fact that math is an important aspect of the academic self-concept (e.g., Lent, Brown, & Gore, 1997; Marsh, 1993; Marsh, Byrne, & Shavelson, 1988), female students who are confronted with the negative math stereotype should experience threat towards their identity as university students. This threat should reduce their sense of belonging to the university and other

university students. Consequently, we predict that these women will be less motivated to seek positive social relationships with other university students. Accordingly, in the following studies, social approach motivation was assessed by the approach of positive social interactions with other university students and sense of belonging was assessed by the sense of belonging to the university and university students in general.

Study 1a and Study 1b are lab experiments examining the effect of social identity threat on social approach motivation with female (Study 1a) and female and male participants (Study 1b). In Study 1b, we also tested the hypothesis that social identity threat leads to a reduced sense of belonging, which, in turn, decreases social approach motivation. In Study 2, we aimed to test the same predictions in an environment consisting only of women, to make sure that no cues that trigger threat might arise in the control condition and thus weaken our experimental manipulation (see e.g., Schuster & Martiny, 2017; Sekaquaptewa & Thompson, 2003). In Study 3, we tested the ecological validity of the effects found in the lab through a correlational study of female psychology students' self-reported experience of social identity threat in statistics classes.

To induce social identity threat, we used an established procedure used in stereotype threat research that consists of (a) the manipulation text saying that women are underrepresented in math-related fields of study and that this is often explained by men's superior performance in standardized math tests and (b) a subsequent math test consisting of 15 mathematical problems (Jamieson & Harkins, 2009; Schuster et al., 2015). Although we did not aim to investigate the performance in the math test in the present research, we decided to include a math test in the lab studies for two reasons. First, we wanted to follow the established experimental procedure and, thus, enable comparison of our findings with existing stereotype threat research. Second, we wanted to strengthen the social identity threat manipulation. The 15 mathematical problems are constructed in a way so that the majority of

the participants solve only very few of them (across conditions participants in all three studies answered on average 4.10 problems out of 15 correctly). Thus, working on the problems was perceived as difficult and frustrating (perceived difficulty of the math test across all three studies and conditions was $M = 5.67$ on a 7-point Likert scale). We assumed that in the experimental group, but not in the control group, this negative experience of working on the test would be interpreted as a confirmation of the stereotype and thus strengthen the experimental manipulation.¹

Study 1a

Method

Participants and design. Seventy-nine female university students ($M_{\text{age}} = 19.82$ years, $SD_{\text{age}} = 1.60$; excluding two participants, one because he/she did not indicate his/her gender, the other one because it was a man) from a small Southern German university participated in the study. Participants were randomly assigned to one of the two experimental conditions (social identity threat: $n = 40$ vs. control condition: $n = 39$). A power analysis (Faul, Erdfelder, Lang, & Buchner, 2007) for a mixed-design ANOVA with two groups, α -error probability of 0.05, power ($1-\beta$ -error probability) of 0.8, and a sample size of $N = 79$ revealed that Study 1a was powered to find an effect of $d = 0.56$ (note that we converted all effect sizes in the manuscript to Cohen's d in order to enhance comparability between the results; for the formulas for converting, see Cohen, 1988, pp. 281, 284, 285).

Social identity threat manipulation. After receiving general information about the study, participants in the social identity threat condition read a short text explaining that women are underrepresented in math-related fields of study and that the few women studying in technical-mathematical fields, for example, have high dropout rates. It stated that this is often explained by men's better performance in standardized math tests (see Supplemental Material for the complete manipulation). After reading the introductory text, participants were

informed that they would be working on one of these tests. In the control condition, participants did not read any gender-related information before taking the math test.

Math test and questionnaire. The math test consisted of 15 mathematical problems. Participants had to decide which of two values derived from a text or an equation was higher (Jamieson & Harkins, 2009; Schuster et al., 2015). For example, $x > y$; A: $2y/4x$ and B: $x/2y$. Participants had to choose one of the following answers: a) A is larger than B; b) B is larger than A; c) A and B are equally large or d) the given information is insufficient to decide whether A or B is larger.

Assessment of social approach motivation. Participants were asked to respond to three items based on scales from Elliot et al. (2006) and Lavigne, Vallerand, and Crevier-Braud (2011; e.g., “I find it exciting to discuss with female students on numerous topics”; 1 = *not at all true*; 7 = *completely true*) and three newly-generated items. Of these six items, one newly-developed item to measure social approach motivation and one exploratory item had insufficient theoretical selectivity. That is, they did not differentiate well between approach and avoidance with regard to the underlying motivation. Therefore, these two items were not included in the scale (see Supplemental Material for the specific items). In order to control for possible effects of target gender, participants were asked to complete the same items for both male and female students (e.g., “I find it exciting to discuss with other male students on numerous topics” and “I find it exciting to discuss with other female students on numerous topics”; for female targets: $\alpha = .67$; for male targets: $\alpha = .74$). The order was counterbalanced: Half of the participants were asked to first indicate their social approach motivation towards other female students and then towards male students, the other half received the reverse order (the complete scale is reported in Supplemental Material).

Procedure. After arriving in the lab, the experimenter—a female university student—greeted the participants and seated them at a desk. Participants were asked to read and sign a

consent form. They received information about the goal of the study and the social identity threat manipulation. Following the manipulation, participants received an example item for the upcoming math test with the correct calculation method and the result. Participants were instructed that they would be working on 15 math problems for the following 15 minutes and that their goal was to be quick and to solve each problem correctly. After a start signal, participants started working on the math test. Subsequently, they answered a questionnaire assessing social approach motivation² and demographics (sex, age, grade in math in the final report of high school, and native language), were debriefed, thanked, and dismissed³.

Results and Discussion

We tested the hypothesis that the activation of negative performance-related stereotypes would influence participants' social approach motivation. We used a repeated measures ANOVA with target gender (approach motivation towards male students vs. female students) as a within-subject factor, condition as a between-subject factor, and order (1 = motivation items answered for male students first vs. for female first) as a covariate. The main effect of target gender was significant, $F(1,76) = 17.63, p < .001, d = 0.96$, indicating that our female participants reported higher social approach motivation towards female students ($M = 5.57, SE = 0.08$) than male students ($M = 5.18, SE = 0.09$). There was no interaction between target gender and order, $p = .85$, nor between target gender and condition, $p = .82$. As predicted, the main effect of condition was significant, $F(1,76) = 4.71, p = .03, d = .50$ (see Figure 1), indicating that participants in the social identity threat condition ($M = 5.41, SE = 0.12$) reported lower levels of social approach motivation than participants in the control condition ($M = 5.77, SE = 0.12$). In sum, the results of Study 1a provide preliminary evidence for the predicted effect of social identity threat on social approach motivation. In line with our hypotheses, the activation of a negative performance-related stereotype decreased female

university students' motivation to approach positive interactions with other male and female university students.

Study 1b

In a next step, we aimed to replicate the results of the first study and tested whether the decrease in social approach motivation was indeed triggered by the activation of a negative performance-related stereotype in an achievement situation. To do so, we included both female and male participants. As men should not be threatened by the negative stereotype about women's math performance, we predicted that their subsequent social approach motivation would be less affected by the stereotype threat manipulation than women's. Additionally, we investigated whether sense of belonging to university mediates the relationship between social identity threat and social approach motivation.

Method

Participants and design. One hundred and sixty-four university students (80 female; $M_{\text{age}} = 23.22$ years, $SD_{\text{age}} = 3.14$) from a large Swiss university participated in the study. Participants were randomly assigned to one of the two experimental conditions (social identity threat: $n = 80$, 40 female, vs. control condition: $n = 84$, 40 female). A power analysis for a mixed-design ANOVA with four groups, α -error probability of 0.05, power ($1 - \beta$ -error probability) of 0.8, and a sample size of $N = 164$ revealed that Study 1b was powered to find an effect of $d = 0.46$.

Procedure and materials. The procedure, social identity threat manipulation, and math test were the same as in Study 1a. We added three items to the existing social approach motivation scales used in Study 1a assessing how frequently participants pursued particular social approach goals with other students (using a gender-neutral labeling; e.g., "I would like to socialize with other students"; 1 = *never*; 7 = *very often*; Nikitin & Freund, in press). In addition, all participants answered the social approach items targeting men first. Because the

new items were gender neutral and target gender did not have an effect in Study 1a, we computed one social approach motivation scale out of the scales targeting men and women and the new items ($\alpha = .85$; see Supplemental Material for the complete scale). In addition, sense of belonging to the university and the students as a group was assessed with eight items based on the membership and acceptance subscales by Good and colleagues (2012; e.g., “I feel like I belong at university.”; “I feel related to other students.”; $\alpha = .88$; see Supplemental Material for the complete scale). As in Study 1a, we then assessed demographics including sex, age, grade in math in the final report of high school, and native language.

Results and Discussion

We conducted a univariate ANOVA with condition and participant gender as independent variables and social approach motivation as the dependent variable. There was neither a main effect of condition, $F(1,160) = 1.34$, $p = .25$, nor of gender, $F(1,160) = 0.02$, $p = .89$. The interaction between condition and gender was not significant, but there was a non-significant trend, $F(1,160) = 3.81$, $p = .05$, $d = 0.31$. Independent samples t-tests showed that while men’s social approach motivation was not influenced by the activation of negative stereotypes about women in math (social identity threat condition: $M = 5.51$, $SE = 0.14$; control condition: $M = 5.41$, $SE = 0.11$, $t(82) = 0.56$, $p = .58$), women’s social approach motivation was reduced in the social identity threat condition ($M = 5.28$; $SE = 0.13$) compared to the control condition ($M = 5.67$, $SE = 0.11$), $t(78) = -2.22$, $p = .03$, $d = 0.50$ (see Figure 1).

Next, we tested if women’s sense of belonging to university mediated the relationship between experiencing social identity threat and social approach motivation. Thus, we induced social identity threat as predictor, women’s sense of belonging as mediator, and social approach motivation as outcome. We used Hayes Process Macro for SPSS (Model 4; Hayes, 2013) to test this prediction (see Figure 2 for a visual image of the model). Results showed no significant relationship between condition and sense of belonging to university ($p = .26$), but a

significant relationship between sense of belonging and social approach motivation (0.31, $SE = 0.07$, $t = 4.69$, $p < .001$, 95% CI [0.18, 0.44]).

Taken together, the results of Study 1b only partly confirmed our hypotheses. They provided evidence that women, but not men, experienced a decrease in social approach motivation when negative stereotypes about women were activated in an achievement situation. However, we did not find the predicted effect of social identity threat on sense of belonging. This might be due to the experimental setting of the study, in which men and women were tested in mixed-gender groups. Earlier research has shown that the presence of men (especially when they outnumber women) can induce social identity threat (e.g., Schuster & Martiny, 2017; Sekaquaptewa & Thompson, 2003). For this reason, the women in the present study might have felt some social identity threat even in the control condition. This might explain the weak effects of our manipulation on sense of belonging. Study 2 was conducted to replicate Study 1b with only female participants, so that the presence of male participants would not activate social identity threat in the control condition.

Study 2

The aim of the second study was twofold: First, we aimed to replicate the effect of negative performance-related stereotypes on women's social approach motivation found in Studies 1a and 1b. More importantly, we aimed to provide a better test of the prediction that the relationship between stereotype activation and social approach motivation would be mediated by sense of belonging to the university.

Method

Participants and design. One hundred female university students ($M_{\text{age}} = 24.05$ years, $SD_{\text{age}} = 5.04$) from a large Swiss university participated in the study. Participants were randomly assigned to one of the two experimental conditions (social identity threat condition: $n = 50$ vs. control condition: $n = 50$). A power analysis for a mixed-design ANOVA with two

groups, α -error probability of 0.05, power ($1-\beta$ -error probability) of 0.8, and a sample size of $N = 100$ revealed that Study 2 was powered to find an effect of $d = 0.50$.

Procedure and materials. The procedure, social identity manipulation, math test, and the assessment of social approach motivation were the same as in Study 1a (for female targets: $\alpha = .72$; for male targets: $\alpha = .79$). Again, approach motivation towards men was assessed first. Sense of belonging to the university and to the students as a group was assessed as in Study 1b ($\alpha = .91$; for the complete scales see the Supplemental Material). We then assessed demographics including sex, age, grade in math in the final report of high school, and native language.

Results and Discussion

We followed the procedure of Study 1a and tested the prediction that the activation of negative achievement-related stereotypes influences women's social approach motivation. A repeated measures ANOVA was conducted with target gender (i.e., motivation to approach male students vs. female students) as a within-subject factor and condition (social identity threat vs. control condition) as a between-subject factor. The main effect of target gender was significant, $F(1,98) = 32.20, p < .001, d = 1.15$, indicating that participants' social approach motivation towards women ($M = 5.83, SE = 0.75$) was higher than towards men ($M = 5.44, SE = 0.95$). The interaction between target gender and condition was not significant, $p = .45$. Importantly, the predicted main effect of condition was significant, $F(1,98) = 6.49, p = .01, d = 0.50$ (see Figure 1), indicating that participants reported lower social approach motivation in the social identity threat condition ($M = 5.43, SE = 0.11$) than in the control condition ($M = 5.83, SE = 0.11$).

Next, we tested the prediction that the sense of belonging to university would mediate the relationship between stereotype activation and social approach motivation. We used Hayes (2013) Model 4 (see Figure 2). Results showed a significant effect of condition on

sense of belonging ($a = -0.18$, $SE = 0.09$, $t = -2.00$, $p = .049$, 95% CI [-0.36, -0.001]), which in turn predicted social approach motivation ($b = 0.44$, $SE = 0.08$, $t = 5.53$, $p < .001$, 95% CI [0.28, 0.59]). We used bootstrapping analyses to test the indirect effect (50,000 bootstrap samples; bias-corrected 95% CI). Results showed a significant indirect effect ($ab = -0.08$, $SE = 0.04$, 95% CI [-0.17, -0.004]). Sense of belonging fully mediated the effect of condition on social approach motivation with a mediation effect size of $R^2 = 0.01$, 95% CI [0.001, 0.12]. The direct effect of condition on social approach motivation was no longer significant ($c' = -0.12$, $SE = 0.07$, $t = -1.68$, $p = .10$). This confirmed our prediction that sense of belonging to the university and other university students mediates the relationship between social identity threat and social approach motivation among female university students.

In sum, the results of the second study replicated and extended the results of the first studies. As in Study 1a and 1b, the activation of a negative performance-related stereotype diminished female university students' approach motivation towards other university students. In contrast to Study 1b, under the improved methodological conditions of this study, we provided evidence that a reduced sense of belonging to the university mediated the relationship between stereotype activation and reduced social approach motivation.

Study 3

The aim of the third study was to test the generalizability of the effects found in controlled laboratory conditions in the first studies in a natural environment. We conducted a correlational study with female psychology students to investigate whether the extent to which students experienced social identity threat in statistics classes would predict their sense of belonging to university and, thereby, their social approach motivation towards other university students. Demonstrating the same relationship between social identity threat, sense of belonging, and social approach motivation in the field would provide support for the natural occurrence of this phenomenon.

Method

Participants. One hundred thirty-five female university students ($M_{\text{age}} = 21.23$ years, $SD_{\text{age}} = 2.68$; one participant was excluded from dataset because he/she did not indicate his/her gender) in their second semester of psychology at a large Swiss university participated in the study. All participants had at least one semester of experience with statistics from statistics lectures and an applied statistics lab course. A power analysis for a linear regression with one predictor, α -error probability of 0.05, power ($1-\beta$ -error probability) of 0.8, and a sample size of $N = 135$ revealed that Study 3 was powered to find an effect of $d = 0.12$.

Measurements. The questionnaire was entitled “Math and Statistics Ability in Psychology.” For the measurement of *experiencing social identity threat* in statistics classes, we adopted four items from Shapiro (2011; e.g., “I am worried that I will confirm stereotypes about women’s math abilities in statistics classes”, see Supplemental Material for the complete scale; $M = 2.61$, $SE = .09$, $\alpha = .68$). *Social approach motivation* was assessed by the same items as in Study 1a and 2. Because of time constraints, however, we did not differentiate between female and male student targets, but used a gender-neutral wording in each item, leading to one approach score ($M = 4.73$, $SE = .07$, $\alpha = .73$). *Sense of belonging* was assessed using a short version (six out of eight items) of the same measure as in Study 1b and 2 ($M = 4.50$, $SE = .07$, $\alpha = .88$). Demographics included sex and age.

Procedure. A female university student collected the data in a large introductory lecture in motivational psychology. She informed all students collectively about the goals of the study, the voluntary and anonymous participation, and asked only female students to participate in the study. She then distributed the questionnaires. The completed questionnaires were collected in a box. Participants were collectively thanked and debriefed.

Results and Discussion

In the following analyses, we used experienced social identity threat in statistic classes as predictor, sense of belonging to university as mediator, and social approach motivation towards other university students as the outcome. As in Study 1b and 2, we used Hayes Model 4 (2013; 50,000 bootstraps) to test the mediational model. Although the direct effect of experienced social identity threat on social approach motivation was not significant ($c = -0.07$, $SE = .07$, $t = -1.07$, $p = .28$), the effect of experienced social identity threat on sense of belonging was significant ($a = -0.15$, $SE = 0.07$, $t = -2.16$, $p = .03$, 95% CI [-0.29, -0.01]), which in turn predicted social approach motivation ($b = 0.46$, $SE = 0.08$, $t = 6.09$, $p < .001$, 95% CI [0.31, 0.62]). The indirect effect was also significant ($ab = -0.07$, $SE = 0.03$, 95% CI [-0.15, -0.01]; see Figure 2).

The results of the third study provide further evidence for the negative relationship between social identity threat and the motivation to approach positive social outcomes via participants' sense of belonging in a natural environment. Even though the direct effect of social identity threat on female students' social approach motivation was not significant in the present study, we found a significant indirect effect via sense of belonging. This means that the more female psychology students experienced social identity threat in their statistics classes, the less they felt that they belonged to the group of students at the university. The less they felt they belonged to university, the less motivated they were to approach other students in order to obtain positive social outcomes. Thus, the present study adds to existing evidence showing that social identity threat does not only occur in the lab but also has important real-life consequences (Aronson & Dee, 2012).

General Discussion

Since Steele and Aronson's (1995) work on the consequences of social identity threat on performance, we know that negative stereotypes do not only affect their targets through the discriminatory behaviors of people holding these stereotypes, but that negative stereotypes

can affect their targets even before being translated into behavior (Steele et al., 2002). Recent studies extended this earlier research by demonstrating a broad variety of negative consequences of experiencing social identity threat for the relationship between the person and the relevant domain (e.g., Holleran et al., 2011; Woodcock et al., 2012). In the present work, we add to this research by demonstrating that social identity threat can also negatively affect relationships between the targeted person and other people related to the domain: Results of three laboratory experiments and one correlational study provide evidence that experiencing social identity threat can diminish people's social approach motivation. This negative effect of social identity threat on social approach motivation is important, as social approach motivation is crucial for establishing and maintaining positive social relationships (Gable, 2006), which, in turn, is essential for psychological and physical health (Umberson et al., 2010). This is particularly true in young adulthood because establishing a personal and professional social network is an important developmental task in this age group (Nikitin, Schoch, & Freund, 2014). As earlier research has shown that social networks are related to individual and group performance (e.g., Sparrowe, Liden, Wayne, & Kraimer, 2001), impoverished social networks in academic or occupational circles might lead to a downward spiral, hampering stereotyped individuals' performance and work-related success. In addition, social approach motivation also affects people's well-being beyond young adulthood (Nikitin et al., 2012), as involvement in positive social relationships prevents loneliness and isolation. Loneliness and isolation are important predictors of subjective well-being and health throughout the life span (Pinquart & Sorensen, 2001). Taken together, our research suggests that experiencing social identity threat leads people to seek out less social interactions with people associated with the stereotyped domain, limiting their social network in the stereotyped domain, which can negatively affect their psychological and physical health and general well-being (Spencer, Logel, & Davies, 2016).

The present work provides first evidence that this effect is driven by the reduced sense of belonging to the threatened domain. People might feel “out of place” in contexts that are associated with the threatened domain and thus feel uncomfortable approaching positive interactions with others in these contexts. In two out of three studies, we found support for this hypothesis. On the one hand, our findings are in line with earlier work showing psychological disengagement from the stereotype-relevant domain after social identity threat (Major & Schmader, 1998) and with empirical evidence that a reduced sense of belonging diminishes cooperative and prosocial behavior (Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007). On the other hand, people are often highly motivated to reconnect with others when their belongingness is threatened (e.g., because of social exclusion; Wesselmann, Ren, & Williams, 2015; Williams & Nida, 2011). We propose that participants in our studies were not motivated to reconnect with others within the stereotyped domain because first, people who experience repeated threats to their sense of belonging tend to disengage from social relationships in order to avoid future unpleasant social interactions (Wesselmann, Williams, Ren, & Hales, 2014). As it is likely that young women are repeatedly confronted with negative stereotypes about their math abilities (such as in math classes; Keller, 2007; Keller & Dauenheimer, 2003), social identity threat might reduce, not enhance, their social approach motivation. Second, people who are socially excluded based on their permanent group membership (such as gender) recover emotionally more slowly from social rejection than people who are excluded based on a temporary group membership (Wirth & Williams, 2009). Fast recovery from social exclusion, however, is needed for reconnection attempts (Wesselmann et al., 2015). Finally, the present findings show that social identity threat leads to lower levels of social approach motivation in the academic setting (i.e., towards other students). We suspect that targets of social identity threat may still seek connection to people that are not associated with the threatened domain (e.g., their families or members of their

sports team). This argumentation is in line with findings demonstrating that reduced sense of belonging (through social exclusion) leads to motivation to socialize with new people but not with people who are connected to the social exclusion (Maner, DeWall, Baumeister, & Schaller, 2007). In fact, people who are connected to the social exclusion are viewed and treated more harshly by the excluded person even when they are not directly involved in the exclusion (Twenge et al., 2007). In the present research, we only investigated participants' approach motivation towards other people connected to the stereotyped domain and so we do not yet know whether social approach motivation towards people not related to the university increases after social identity threat. Future research should investigate this question.

Thus, for the present, we can only conclude that social identity threat reduces social approach motivation towards members of the stereotyped domain, which might not only have negative consequences for individual well-being, but also for the success of the targeted person in this domain (Sparrowe et al., 2001). This might also explain why female participants in the present studies—even though they showed a strong preference to approach women in general—did not approach female students more than male students after experiencing social identity threat. This finding is in contrast to research showing that discriminated groups increase their identification with the ingroup (e.g., Schmitt, Branscombe, Kobrynowicz, & Owen, 2002). Although other female students represent ingroup members because of their gender, they are also associated with the activated negative stereotype because of their membership in the group of university students. It might have been the case that the specific form of social identity threat used in the present work highlighted female students' membership in the group of university students instead of their membership in the group of women (see Ethier & Deaux, 1994, for similar argumentation regarding race). Further research should explore this in more detail.

A practical implication of the present findings is that decision makers, for example at universities and companies, should not only be informed about the negative consequences of stereotypes on performance, but should also learn about the negative consequences of stereotypes on interpersonal relationships. Interventions should be developed that specifically target building up social networks for people who are negatively stereotyped in specific domains or work settings in order to help them to establish a sense of belonging to the domain and thus seek out positive social interactions with people related to the domain, such as fellow students, coworkers, and other professionals.

Limitations and Future Directions

One limitation of the present set of studies is that not all predicted effects were found in all four studies. First, the main effect of social identity threat led to a significant decrease in social approach motivation for women in all three experimental studies (see Figure 1), but not in the correlational study. In the correlational study, the effect of social identity threat on social approach motivation was only found through an indirect effect via sense of belonging. In contrast to the first three studies, in which social identity threat was manipulated, in Study 3, social identity threat was measured. There are theoretical reasons that could explain the lack of the direct effect in Study 3. Study 3 differed from the other studies in the specific measure (i.e., self-report of experienced social identity threat vs. manipulation of social identity threat). In addition, the specific items of the self-report measure in Study 3 need to be considered. In the multi-threat framework, Shapiro and Neuberg (2007) argue that social identity threat can take various forms, depending on who the target of the threat is (oneself or one's group) and who the source is (oneself, outgroup members, or ingroup members). The four items in our study measured participants' concerns about 1) confirming the stereotypes themselves, 2) stereotypes hindering their performance, 3) stereotypes being actually true, and 4) stereotypes influencing other people's judgements about the participants' own performance

(see Supplemental Material for the exact wording). Thus, in this measure, different targets and sources were combined and included four very specific concerns. Not all of these concerns are necessarily equally relevant for our sample in this specific situation. In addition, the measurement is based on the assumption that participants are aware of the role negative stereotypes play in specific achievement situations, such as in statistics classes. As we know from earlier research, social identity threat can also affect behavior if people are not even consciously aware that negative stereotypes have been activated (see work using a subtle activation of stereotypes, for example, Froehlich et al., 2016). Research shows that the subtle activation of stereotypes can induce a diffuse sense of uncertainty (e.g., Schmader & Beilock, 2012) instead of a set of specific concerns. For this reason, some of the female university students in our study might not have been aware of the activation of negative stereotypes about women in statistics classes. Thus, we think that our specific choice of measurement of experienced social identity threat might have contributed to the lack of a significant relationship between social identity threat and social approach motivation in Study 3.

The indirect effect via sense of belonging was found in two out of three studies. As discussed earlier, one reason for this missing effect in Study 1b might be the specific testing situation (i.e., that participants were tested in mixed-gender groups). In support of this explanation, we found the effect when women were tested in same-gender groups. However, it might also be the case that the social identity threat manipulation only had a weak effect on sense of belonging and therefore did not show up in every study. For this reason, it is very important that further research investigates the robustness of this mediation effect.

The role of sense of belonging should also be tested against possible alternative mechanisms. Although our findings are in line with previous research demonstrating that—in professional or academic settings—social identity threat undermines stereotyped group members' sense of belonging (Walton & Cohen, 2007), there are other possible mediators that

might affect social approach motivation. For example, social identity threat can lead to negative emotions such as anxiety and shame (e.g., Schmader, Johns, & Forbes, 2008) that, in turn, might affect social approach motivation. However, previous research has found little support for the relationship between affect and social approach motivation. For example, including affect as a covariate did not affect participants' affiliation motivation in Maner et al.'s (2007) studies on social exclusion. Moreover, individuals can develop expectations about others' prejudice and discrimination that are not mediated by fears about confirming stereotypes (Mendoza-Denton, Page-Gould, & Pietrzak, 2006). Nevertheless, future research should investigate the relationship between social identity threat, social approach motivation, affect and other potential mediators more closely.

Further, in order to get a better understanding of the long-term consequences of social identity threat on interpersonal relationships, further research should use longitudinal designs and include additional dependent variables such as behavioral intentions to seek out positive social outcomes and subsequent social behavior. There is robust empirical evidence that approach motivation is positively associated with social behavior such as number of daily social interactions (Gable, 2006; Nikitin et al., 2012), active behavior in social interactions (Nikitin & Freund, 2010; Study 2), or responsiveness to social-interaction partners (Gable, Gosnell, Maisel, & Strachman, 2012; Nikitin & Freund, in press). For example, a study by Nikitin, Burgermeister, and Freund (2012) found that a 1-point increase on a 7-point Likert scale assessing social approach motivation was associated with 1.39 more social interactions during the day (the average number of daily social interactions was 5.39) or with a 0.66-point increase on a 7-point Likert scale assessing positive social behavior during the day (i.e., showing positive affect, sympathy, and appraisal towards other people). In another study, Nikitin and Freund (2010) found that students who were involved in a 5-minute videotaped interaction with a stranger talked more than half a minute (33 seconds) longer for each 1-point

increase on a 7-point Likert scale assessing social approach motivation and they had half a minute longer (29 seconds) eye-contact with the interaction partner while talking. In terms of effect sizes, correlations between social approach motivation and social behavior (observed or self-reported) are in the middle-effect size range (around $r \approx .30$; e.g., Gable, 2006) as defined by Cohen (1988). In fact, the majority of psychological studies on individual differences show lower effect sizes, as a recent inspection of 199 meta-analyses revealed (Gignac & Szodorai, 2016; see also Bosco, Aguinis, Singh, Field, & Pierce, 2015). Thus, robust empirical evidence exists that social approach motivation has consequences for actual behavior in everyday-life situations. However, it is important that future research tests whether these motivation-based behaviors are also affected by social identity threat.

Finally, a potential weakness of our design was that the experimental manipulation addressed the underperformance of women in university and science in the mathematical domain, which might not have been equally relevant to all participants' subjects (e.g., philosophy majors might have been less affected than math majors). As outlined earlier, we used this manipulation because math is an important aspect of the academic self-concept in general (as it expresses logical and abstract thinking) and, consequently, feeling threatened in one's math ability translates to feeling threatened as a university student in general. In fact, the main effect of the manipulation on social approach motivation in our studies—in samples with a broad variety of programs—supports this assumption. It is an interesting question for future research whether the effect is even stronger in math-relevant programs (such as science, technology, engineering, and mathematics—STEM). We speculate that this might be the case and that this is one reason why women drop out of STEM programs (and not out of university in general; Brandstätter, Grillich, & Farthofer, 2006; Good et al., 2012; Singh, Allen, Scheckler, & Darlington, 2007). Female students in STEM are much more often confronted with the negative stereotype about women and math than they are in other

university majors. If the stereotype about women's intellectual abilities was more general, such as the negative stereotype about African-Americans' intelligence (e.g., Steele & Aronson, 1995), women would probably not only drop out of STEM but out of university. As our studies show, when women are confronted with negative stereotypes at university, this experience reduces their sense of belonging to university and other students and thus reduces their social approach motivation to male and female university students.

Conclusions

The present results add to the nascent area of research demonstrating that social identity threat can have a broad variety of negative consequences. Our studies show that social identity threat can harm peoples' interpersonal relationships by decreasing their sense of belonging and thereby reducing their social approach motivation. These results are important as they point to far-reaching consequences of social identity threat on people's interpersonal relationships and thus on their general well-being. Only when we know how social identity threat functions will we be able to create interventions enabling people to live up to their full potential and to seek positive social outcomes in interpersonal interactions, independent of their group membership.

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Footnotes

¹For detailed results on math performance, see the Supplemental Material. To summarize, the experimental manipulation did not significantly affect math performance in any of the studies. Even though this is in contrast with some previous findings (e.g., Murphy et al., 2007; Schmader, 2002), it would go beyond the scope of the present work to discuss the reasons for not replicating the effect on performance in depth. For our purposes, it is relevant that math performance did not correlate with social approach motivation in any of the studies. Thus, in the present work, social identity threat influenced people's social motivation irrespective of their performance in the threatened domain.

²In addition to social approach motivation, we assessed social avoidance motivation in all present studies. There is a long-standing research tradition showing that social avoidance motivation (i.e., the motivation to avoid negative social outcomes such as rejection, conflict, and isolation; Gable & Berkman, 2008; Mehrabian, 1994) is also an important component of social motivation. As social avoidance motivation was not in the focus of the present research, we report the findings on social avoidance motivation in the Supplemental Material. Across all studies, social avoidance motivation was unaffected by social identity threat.

³In all studies, we assessed additional variables that were not included in the present analyses: approach and avoidance motivation towards a particular close female and male student (Study 1a and 2), preference for spending spare time with a particular person of one's own choice (Study 1a and 2), mathematical self-concept (Study 1a, 1b, 2), perceived difficulty of the math task (Study 1a, 1b, 2), motivation while working on the task (Study 1a, 1b, 2), group identification (all studies), belief in the stereotype (Study 1a, 1b, 2), participants' hypotheses about the purpose of the study (Study 1a, 1b, 2), self-esteem (Study 1b and 3), emotions (Study 1b), importance of close relationships (Study 2), perceived ability in math and statistics in relation to the stereotype (Study 3), and self-concept in math and statistics

(Study 3). These variables were included for exploratory purposes or as potential control variables but they were not substantial for our main hypotheses. Thus, we do not report them here. Interested readers may contact us for more information on these variables.

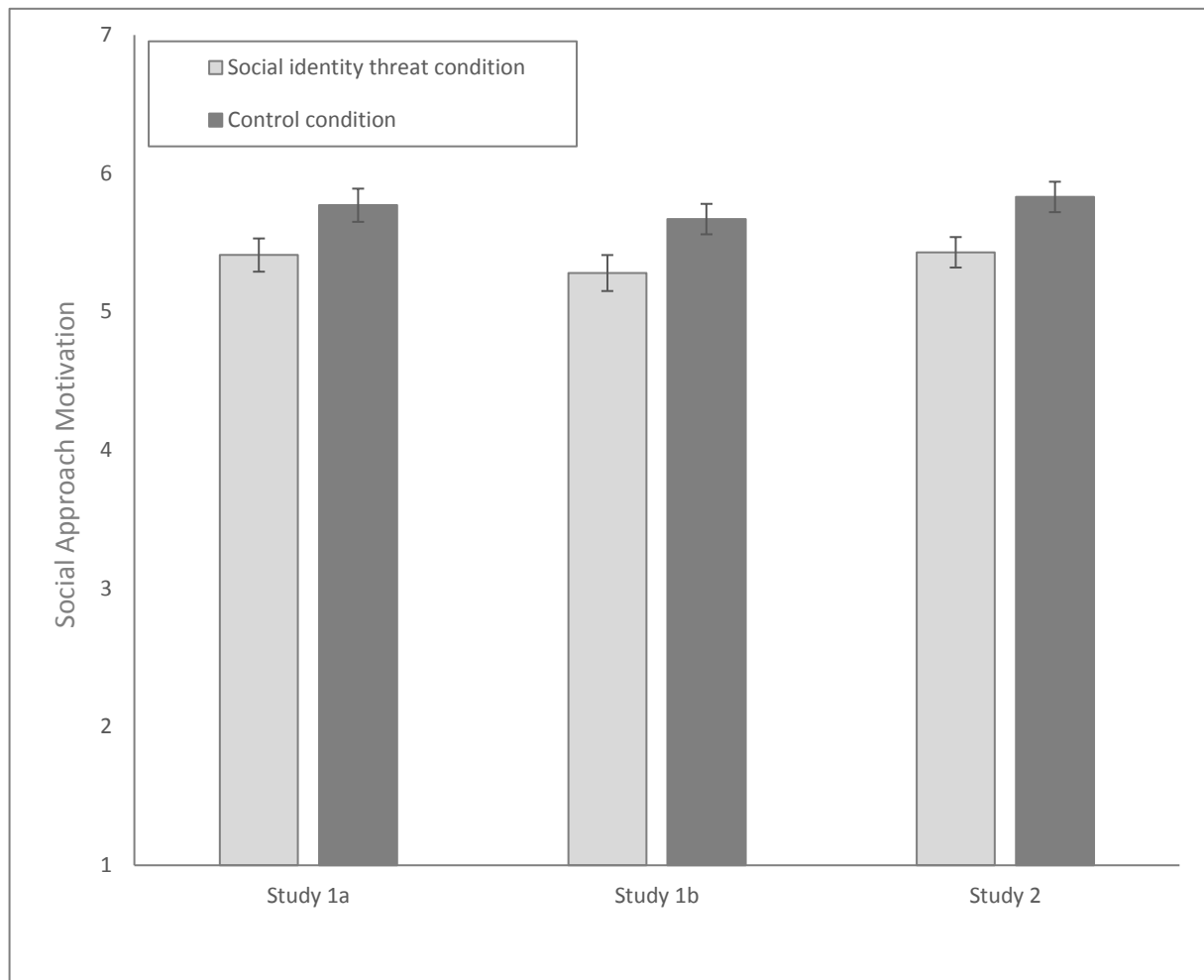


Figure 1. Effects of social identity threat on social approach motivation for women in Study 1a ($N = 79$), Study 1b ($n = 80$), and Study 2 ($N = 100$; error bars reflect ± 1 SE).

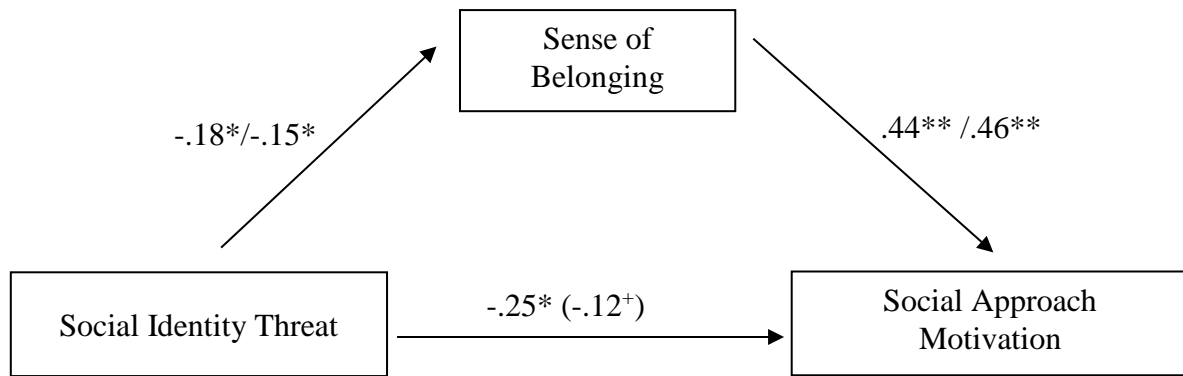


Figure 2. Standardized regression coefficients for the mediation of social identity threat on social approach motivation via sense of belonging. The standardized regression coefficient of stereotype threat on social approach motivation, controlling for sense of belonging, is in parentheses. The first numbers represent the results of Study 2 ($N = 100$; Hayes, 2013, Model 4). The second numbers represent the results of Study 3 ($N = 135$; Hayes, 2013, Model 4).

$^+p < .10$; $*p < .05$; $**p < .001$