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Effects of instagram sports posts on the athletic motivation of female elite athletes: Do they inspire or backfire?

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ABSTRACT

The social networking site *Instagram* provides users with an abundance of photos and information in many domains including sports. The posts are often intended to inspire and motivate users. We argue that the display of success and failure of professional athletes may influence elite athletes' own sports ambitions. Research has shown that exposure to positive ingroup stereotypes and exposure to negative outgroup stereotypes can increase performance (i.e., the stereotype boost effect and the stereotype lift effect, respectively). Based on this research, we conducted three experiments in two different cultural contexts. In all three experiments, we examined whether Instagram posts that showed either ingroup members' success or outgroup members' failure influenced athletic motivation, self-efficacy, and sports-related behavioral intentions of female elite athletes. Experiment 1 (n = 117) was conducted in Germany, whereas Experiments 2 (n = 137) and 3 (n = 143) were conducted in Norway. Results showed that in Germany, participants' athletic motivation and self-efficacy was highest when they were exposed to failing outgroup members (Exp. 1); however, this was not the case in Norway (Exp. 2). In contrast, only Norwegian participants who were exposed to successful ingroup members reported a significant increase in their athletic motivation, but there were no effects regarding self-efficacy and sports-related behavioral intentions (Exp. 3). Boundary conditions for Instagram's role in motivating users and reasons for the differences between the two cultural contexts are discussed.

1. Introduction

The social networking site Instagram is brimming with sports-related content. Professional athletes (e.g., skier Lindsey Vonn and footballer Lionel Messi) as well as sporting organizations (e.g., the National Football League and the Olympics) use the platform to advertise current events and promote their achievements (and sometimes failures). Instagram is currently the second most popular social networking site with more than a billion users worldwide (Statista, 2021a). Young people between 18 and 35 are the most common Instagram users (Statista, 2020a). It is a highly visual network, as it mainly consists of photos. One of the main aims of the network is to inspire other users, who can follow whatever content they choose based on specific hashtags or by following certain profiles.

Elite athletes (i.e., athletes who practice their sport on a competitive level) are usually highly identified with their sport, have strong interest in their own and other sports, and strive to perform well. Due to their general interest in sports, many young elite athletes follow sports-related content on Instagram. In their newsfeeds they are confronted with the successes and failures of other athletes, as well as with potentially stereotyping or devaluing communication (e.g., Plaza et al., 2017). Whereas there is an abundance of research on the influence of trends like #fitspiration on (mainly female) body image (e.g., Prichard et al., 2020), little is known about potential effects of messages portraying ingroup success and outgroup failure on Instagram in the elite sports realm. Some research has investigated performance consequences of exposing athletes to negative stereotypes, examining the effects of *social identity threat* (Steele et al., 2002). However, more knowledge is needed on the role positive messages play in sports, such as messages that imply high ability and the success of the ingroup (e.g., Krendl et al., 2012). Testing the effects of positive messages on Instagram is particularly interesting from an applied perspective, as one central goal of Instagram is to inspire. Therefore, based on social psychological *stereotype boost* and *stereotype lift* research, we argue that viewing messages that portray the

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successes of ingroup members and failures of outgroup members may benefit young elite athletes' motivation, self-efficacy, and sports-related behavioral intentions.

1.1. Gender differences in sports

Sports and physical exercise are largely considered as male-dominated domains (Gentile et al., 2018; Riemer & Visio, 2003) and men are expected to outperform women, for instance, in soccer and basketball (e.g., Martiny et al., 2015). There is evidence that men are indeed superior to women in tasks that demand speed or strength (e.g., Bois et al., 2002; Knisel et al., 2009). However, in line with Chalabaev et al. (2013), we argue that while some variance of this gender disparity can be explained by physiological differences, physiological factors alone cannot explain the large differences that can be observed in sports performance and participation between women and men (e.g., Biddle et al., 2011; Chen & Darst, 2002; Knisel et al., 2009). Therefore, psychological factors such as gender stereotypes need to be considered when aiming to understand the differences in women's and men's performance and participation in sports (Chalabaev et al., 2013).

There are two ways that stereotypes can lead to gender disparities: They can either hinder members of a negatively stereotyped group from doing their best (i.e., stereotype threat), or they can motivate members of a positively stereotyped group, which compares to the negatively stereotyped group, to invest extra effort (i.e., stereotype lift or stereotype boost; see below). *Stereotype threat* is a phenomenon examined in social psychological research that can lead to reduced performance, loss of motivation, and reduced interest (for a review see Spencer et al., 2016). This effect occurs when people face negative expectations concerning their ability in the domain (i.e., stereotypes) and consequently show reduced performance. Individuals who regard their membership in a group as an important aspect of their self-concept are more prone to experience such effects (Keller & Molix, 2008). Previous studies have shown that women perform worse in physical tasks and sports activities under stereotype threat (e.g., Chalabaev, Sarrazin, et al., 2008; Hermann & Vollmeyer, 2016; Hively & El-Alayli, 2014; Martiny et al., 2015; see also; Stone et al., 2012). A meta-analysis with 22 independent studies revealed a small to medium effect size of $d = 0.33$ in support of this assumption (Gentile et al., 2018).

1.2. Stereotype lift and boost effects in sports

Although there is some research on stereotype threat in sports (for an overview see Gentile et al., 2018, or Smith & Martiny, 2018), thus far, research has largely neglected potential *stereotype boost* or *stereotype lift* effects in sports. *Stereotype boost* (also called the *stereotype susceptibility effect,* Shih et al., 1999) is a performance boost resulting from the activation of a positive stereotype of the ingroup (Shih et al., 2012). For example, a stereotype boost effect in sports was demonstrated in work showing that when African American women's positively stereotyped racial identity was made salient (stereotype: African Americans have high natural abilities in sports), they showed better athletic performance than those whose negatively stereotyped gender identity (stereotype: women are bad in sports) was made salient, as well as compared to a neutral control condition (Howard & Borgella, 2018). *Stereotype lift* refers to the improvement of a person's performance due to negative stereotyping of the out-group (Walton & Cohen, 2003). Research showed that both men and women who were informed about the lower performance of the other gender showed an improvement in a balancing motor task (Chalabaev, Stone, et al., 2008) and in a basketball performance task (Laurin, 2013).

Whereas early work on the consequences of (negative and positive) stereotypes in motor and cognitive tasks mostly focused on performance, the perspective has recently broadened to include other psychological variables such as interest and motivation. Research has shown that stereotype threat increases the likelihood of people to withdraw from a setting or a domain that they previously highly identified with (Walton & Cohen, 2007). Stereotype threat can also lead to the loss of interest and reduced sense of belonging (e.g., Good et al., 2012; Martiny & Nikitin, 2019; Mello et al., 2012). In sports, motivation has been argued to be a core factor that relates to various challenges of athletes and ultimately influences success in training and competitions (Pelletier et al., 1995). Thus, experiencing stereotype threat in sports may lead to avoiding competitions or resigning from the respective type of sport altogether, while athletes who do not experience threat may choose to become a coach or stay otherwise actively involved in their sport even after their own active career has ended. This striving and the pursuit of sports-related goals out of interest may be differentiated from external factors which contribute to a successful sports career. Consequently, intrinsic motivation may be particularly affected by confrontation with stereotypes (cf. *Motivational Experience Model of Stereotype Threat*; Thoman et al., 2013).

In contrast to these negative effects of stereotype threat on motivation, previous theorizing on stereotype lift effects suggests that negative outgroup stereotypes may encourage downward social comparisons in a relevant comparison domain; consequently, people may experience an increase in motivation and self-confidence (Walton & Cohen, 2003). Therefore, in the present work, we argue that if negative messages can reduce motivation and self-efficacy, then positive messages that imply the success of ingroup members may have the opposite effect; they might increase motivation, self-efficacy, and sports-related behavioral intentions.

1.3. Social media communication of success and failure in sports

Success and failure are important in the world of sports; if shown in the media, one's success or failure becomes visible to everyone. This invites people who highly identify with sports to compare themselves with the presented athletes. They may serve as role models for the recipients, as they bear high potential for identification with their values and abilities (Wegener, 2008). Therefore, it is not surprising that sports are a popular topic on Instagram. Also, sports fans appear to be more committed to Instagram content than others, as they watch sports-related Instagram Stories for longer than users in other areas (Conviva, 2020). Yet, two problems arise. First, images and communications on Instagram often display a polished version of reality by focusing on achievements and positive life events (Reinecke & Trepte, 2014). Second, Instagram coverage of sports perpetuate gender stereotypes; a recent study revealed that female professional athletes are portrayed less frequently than male professional athletes, and if they appear, it is more likely with a man by their side or in non-athletic situations (Romney & Johnson, 2020).

Despite the fact that sports-related gender stereotypes are ever-present in the media (Koivula, 1999), thus far, few studies examining stereotype lift or boost effects in sports have used media stimuli (e.g., Krendl et al., 2012). In the area of cognitive performance, a meta-analysis with 12 independent effects revealed an overall (non-significant) effect of $d = 0.17$; hence, media communication (e.g., news or advertisements) may lead to stereotype lift, but more research is needed to solidify this assumption (Appel & Weber, 2021). Thus, although there is some evidence that presenting negative stereotypes against outgroups in the media can have positive effects on ingroup members' cognitive performance (e.g., math tests), the impact on sports performance is less clear.

Further, not much is known about how social media content affects athletes' motivation. For this reason, in the present research, we investigated whether viewing social media posts about ingroup members performing well or outgroup members failing would activate a positive ingroup image, and thus lead to increased athletic motivation, self-efficacy, and intentions to invest in the domain in the future. When female elite athletes view Instagram posts about the successes of female professional athletes in comparison to male professional athletes, this

may lead to a boost effect. Likewise, when female elite athletes view Instagram posts about the failures of male professional athletes in comparison to female professional athletes, this may lead to a lift effect.

2. The present research

It remains an open research question whether social networking site content that depicts positive or negative sports-related information may change young athletes' motivation, self-efficacy, and sports-related behavioral intentions. The present research aims to examine potential stereotype lift and boost effects based on Instagram posts about professional athletes' successes and failures. We conducted three experiments to examine our hypotheses. To this aim, young female elite athletes were recruited and randomly assigned to view posts that portrayed female successes, male failures, or neutral control content. We focused on elite athletes to ensure high domain identification. Subsequently, their athletic motivation, perceived self-efficacy, sports-related behavioral intentions, and Instagram behavioral intentions were assessed. The studies further examined individual differences in competition level and Instagram intensity as potential predictors. Exploratory analyses of participants' Instagram behavior in the context of sports-related content are reported in the online supplement (see Supplement 2). We report the original study (Experiment 1, Germany) and two follow-up studies (Experiments 2 and 3, Norway) which were implemented in a different cultural context. Adhering to state-of-the-art research practices, all studies were preregistered; deviations from the preregistrations are specified in the following. We follow a fully transparent approach and report all experiments, conditions, and variables examined. Preregistration documents, stimulus material, measures, and the datasets of all experiments can be found in the Open Science Framework (https://osf.io/tjp7y/?view_only=177f10824b5b4aeb995f215808f8f1f7https://osf.io/tjp7y/).

3. Experiment 1

This experiment was preregistered under https://aspredicted.org/378gi.pdf. The experiment was conducted using a three-group between-subjects design.[1] We examined whether Instagram communication of sport successes and failures influences athletic motivation, self-efficacy, and sports-related behavioral intentions of female elite athletes. We hypothesized that participants in the female success condition would show higher athletic motivation (Hypothesis 1a), higher self-efficacy (Hypothesis 2a), and greater sports-related behavioral intentions in the future (Hypothesis 3a) than participants in the male failure and in the control condition. In addition, participants in the male failure condition were expected to show higher athletic motivation (Hypothesis 1b), higher self-efficacy (Hypothesis 2b), and greater sports-related behavioral intentions in the future (Hypothesis 3b) than participants in the control condition.

3.1. Method

3.1.1. Instagram posts

Participants were randomly assigned to one of the three experimental conditions (female success vs. male failure vs. control). We created four fictional Instagram posts for each condition, keeping the number of "likes" and the Instagram account ("Teamdeutschland") constant. All posts depicted actual sports events, successes, or failures. In the female success condition, participants read the following information: "Last year, in international competitions, German female athletes performed on average better than German male athletes. Here are a few examples." Then, they saw four successful female professional athletes (e.g., biathlon winner Laura Dahlmeier). In the male failure condition, participants read the following information: "Last year, in international competitions, German male athletes performed on average worse than German female athletes. Here are a few examples." Then, they saw four failures of male professional athletes (e.g., the German team losing during the handball European championship). In the control condition, participants read the following information: "German female and male athletes participate in international competitions. Here are a few examples." Then, they saw four gender-neutral posts of international sports events (e.g., the Olympic Games in Japan). All posts included appropriate hashtags, that is, #girlsforthewin (female success), #schadejungs (English: #pityboys; male failure), and #wirfuerD (English: #usforG; control). Examples of the stimulus material are displayed in the Online Supplement (Supplement 1). The complete stimulus material can be found in the OSF repository (https://osf.io/tjp7y/).

3.1.2. Measures

All instructions and measures were presented in German and can be found in the OSF repository. Cronbach's alphas as an indicator of internal consistency are reported in Table 1. Measures are listed in the same order they were presented.

3.1.2.1. Instagram use. Participants' Instagram use was assessed with the *Instagram Intensity Scale* (Stapleton et al., 2017), based on the level of agreement with six statements concerning the social network (e.g., "Instagram is part of my everyday activity") rated on a five-point scale (1 = *strongly disagree;* 5 = *strongly agree)*. This scale assesses participants' emotional connectedness and integration of the social network site in their day-to-day life. An additional item asked for the amount of time that participants spent on Instagram on average per day during the past week.

3.1.2.2. Self-efficacy. The *New General Self-Efficacy Scale* (NGSE; Chen et al., 2001) assessed participants' perceived self-efficacy with eight items (e.g., "I will be able to successfully overcome many challenges") on a five-point scale (1 = *strongly disagree;* 5 = *strongly agree*). This scale assesses individuals' tendency to view themselves as capable of meeting task demands in a variety of contexts and represents a construct closely related to motivation and performance (Chen et al., 2001). As the scale was presented in the sports context of this study, we expected participants to rate the items with a sports-related mindset.

3.1.2.3. Athletic motivation. Based on the question "Why do you practice your sport?", participants' reported their athletic motivation (*Sport Motivation Scale*, SMS; Pelletier et al., 1995). Based on Deci and Ryan's *cognitive evaluation theory* (Deci and Ryan, 1985), the scale assesses aspects of athletes' autonomy support, control, and involvement. It covers a broad perspective on athletes' motivation, as it assesses whether individuals are intrinsically motivated, extrinsically motivated, or amotivated. They were provided with a seven-point scale (1 = *does not correspond at all*; 7 = *corresponds exactly*). The questionnaire includes 28 items that can be categorized into seven subscales: amotivation (e.g., "I don't know anymore; I have the impression that I am incapable of succeeding in this sport."), three types of extrinsic motivation (EM: external, introjected, and identified regulation; e.g., "because people around me think it is important to be in shape."), and three types of intrinsic motivation (IM: to know, to accomplish things, and to experience stimulation, e.g., "for the satisfaction I experience while I am perfecting my abilities.").

3.1.2.4. Sports-related behavioral intentions. Six items, based on a scale on behavioral intentions (Kim et al., 2012), assessed participants' behavioral intentions concerning their personal future in their sports-domain (e.g., In your future sports career, how likely is it for you … "to try to become a coach?", "to be actively involved?", "to try to be

[1] Deviating from the preregistration, the conditions were labelled *female success* (= Stereotype boost), *male failure* (= Stereotype Lift), and *control*.

Table 1
Descriptive Statistics (*M, SD*) and Internal Consistencies (Cronbach's α) of Experiments 1, 2, and 3.

	Experiment	α	Experimental condition					
			Control		Male Failure		Female Success	
			N	*M* (*SD*)	*N*	*M* (*SD*)	*N*	*M* (*SD*)
1. Self-Efficacy	1	.86	33	3.45 (0.58)	43	3.77 (0.52)	41	3.46 (0.53)
	2	.85	71	4.24 (0.59)	66	4.01 (0.58)	–	–
	3	.86	68	3.89 (0.55)	–	–	75	3.97 (0.64)
2.1 Amotivation	1	.69	33	2.09 (1.24)	43	1.84 (0.94)	41	1.96 (0.90)
	2	.74	71	1.87 (1.12)	66	2.38 (1.19)	–	–
	3	.76	68	2.17 (1.08)	–	–	75	2.23 (1.11)
2.2 EM: External regulation	1	.75	33	3.45 (1.26)	43	3.66 (1.44)	41	3.33 (1.29)
	2	.62	71	3.24 (1.18)	66	3.49 (1.28)	–	–
	3	.70	68	3.39 (1.29)	–	–	75	3.69 (1.21)
2.3 EM: introjected regulation	1	.73	33	4.33 (1.29)	43	4.63 (1.22)	41	4.93 (1.23)
	2	.73	71	4.85 (1.46)	66	4.94 (1.28)	–	–
	3	.75	68	5.11 (1.37)	–	–	75	5.34 (1.12)
2.4 EM: identified regulation	1	.62	33	4.08 (1.14)	43	4.61 (0.98)	41	4.51 (1.18)
	2	.55	71	4.92 (1.02)	66	4.86 (1.07)	–	–
	3	.46	68	5.09 (1.03)	–	–	75	5.12 (0.86)
2.5 IM: to know	1	.82	33	4.92 (1.10)	43	5.34 (1.05)	41	4.77 (1.24)
	2	.66	71	5.62 (1.03)	66	5.40 (1.01)	–	–
	3	.63	68	5.21 (1.15)	–	–	75	5.40 (0.88)
2.6 IM: accomplishment	1	.71	33	4.78 (0.95)	43	5.30 (1.07)	41	4.77 (1.03)
	2	.75	71	5.69 (1.15)	66	5.48 (0.91)	–	–
	3	.79	68	5.17 (1.15)	–	–	75	5.53 (0.97)
2.7 IM: stimulation	1	.74	33	5.46 (1.17)	43	5.85 (1.05)	41	5.63 (0.92)
	2	.71	71	6.29 (0.80)	66	6.18 (0.76)	–	–
	3	.63	68	6.19 (0.66)	–	–	75	6.09 (0.79)
3. Sports-related Behavioral Intentions	1	.80	33	4.85 (1.26)	43	4.99 (1.28)	41	5.22 (1.29)
	2	.78	71	5.60 (1.12)	66	5.47 (1.15)	–	–
	3	.81	68	5.08 (1.19)	–	–	75	5.39 (1.19)
4. Instagram Behavioral Intentions	1	.81	31	2.98 (1.44)	38	3.64 (1.45)	38	3.74 (1.40)
	2	.79	71	4.99 (1.56)	64	5.06 (1.28)	–	–
	3	.74	68	4.30 (1.37)	–	–	75	4.59 (1.41)
5. Instagram Intensity	1	.89	31	3.09 (0.86)	38	3.42 (0.80)	38	3.04 (0.94)
	2	.81	71	3.36 (0.77)	64	3.68 (0.82)	–	–
	3	.82	68	3.45 (0.89)	–	–	75	3.43 (0.80)

Note. EM: Extrinsic motivation; IM: Intrinsic motivation. For the variables Instagram Behavioral Intentions and Instagram Intensity, only participants who indicated that they use or have used Instagram were included.

further involved, even if you stopped competing yourself?"). Items were answered on a seven-point scale (1 = *I definitively won't*; 7 = *I definitively will*).

3.1.2.5. Instagram Behavioral Intentions. Participants indicated whether they planned on posting sport successes or failures on Instagram or if they intended to follow more sports channels on Instagram. Four items were answered on a seven-point scale (1 = *I definitively won't*; 7 = *I definitively will*). Analyses involving this variable are reported in the Online Supplement (Supplement 2).

3.1.3. Participants

Under the assumption of an effect size of $\eta^2 = 0.25$, $\alpha = 0.05$, and a power of 1-$\beta = 0.80$, the optimal sample size includes a total of $N = 159$ (G*Power; Faul et al., 2007). To balance outliers and potential technical problems during the data collection, we intended to oversample by around 15%, resulting in an initial sample size of $N = 183$ people. Participants ($N = 220$) were recruited via social networking sites, targeting specifically young female elite athletes (i.e., by posting the study link in different networks, email lists, and groups; snowball sampling). After excluding people (all exclusion criteria were preregistered) because they did not complete the experiment ($n = 53$), did not indicate their gender ($n = 2$), did not practice their sport on a competitive level ($n = 11$), failed to correctly answer at least two of the three attention check questions ($n = 30$), or took less than 5 or more than 30 min to complete the experiment ($n = 7$), the final sample consisted of $n = 117$ female participants (age range: 14–47 years, $M = 19.88$ years, $SD = 5.07$). Much of the sample was highly educated ($n = 73$ with high school, bachelor, or master's degree). The majority of participants competed at least at the national level (Competition levels: club: $n = 3$; county: $n = 22$; state: $n = 19$; regional: $n = 8$; national: $n = 34$; European: $n = 13$; world: $n = 18$). The sample included athletes who competed in individual sports (e.g., swimming, roller skating; $n = 79$) and team sports (e.g., soccer, volleyball; $n = 38$). The majority indicated that they use or have used Instagram ($n = 107$) and $n = 92$ followed at least one sports page on Instagram.

3.1.4. Procedure

The experiment was conducted online. Participants were told that the study was about Instagram posts in sports. Participation was voluntary and anonymous, adhering to local ethical and data protection guidelines. After giving their informed consent, participants completed the Instagram Intensity Scale and stated whether they followed any sports pages on Instagram. Participants were then randomly assigned to one of the three conditions (female success vs. male failure vs. control). They were instructed to closely inspect the posts for at least 30 s (this minimum duration was ensured by means of programming of the survey software). After viewing the posts, participants answered three knowledge questions about the pictures to ensure that they had actually looked

at the pictures and read the comments and hashtags. Next, they completed the New General Self-Efficacy Scale, the Sport Motivation Scale, and reported on their sports-related behavioral intentions and their Instagram behavioral intentions regarding sports-related content. Last, participants were asked to report their age, gender, education, type of sport they practiced, and the highest competition level at which they played. Finally, they were provided with an open text field for comments, before being thanked, debriefed, and provided with contact information for questions.

3.2. Results

For descriptive results see Table 1; correlation coefficients are provided in Table 2.

3.2.1. Athletic motivation

A MANOVA with experimental condition (female success vs. male failure vs. control) as the predictor and the seven subscales of athletic motivation as the criteria yielded no significant multivariate main effect, $F_{Wilks\text{-}Lambda}(14, 218) = 1.43$, $p = .139$, $\eta_p^2 = 0.085$. However, an inspection of the univariate effects (Bonferroni corrected) revealed a significant difference regarding the subscale "IM – accomplishment", $F(2, 114) = 3.51$, $p = .033$, $\eta_p^2 = 0.058$ (see Fig. 1), with the male failure condition showing descriptively the highest mean (post-hoc tests, Bonferroni corrected) compared to the female success ($p = .063$) and the control condition ($p = .094$). The subscale "IM - to know" trended in the same direction, $F(2, 114) = 2.80$, $p = .065$, $\eta_p^2 = 0.047$, with the male failure condition showing descriptively the highest mean (post-hoc tests, Bonferroni corrected) compared to the female success ($p = .071$) and the control condition ($p = .356$). This partly supports Hypothesis 1b, but not Hypothesis 1a.

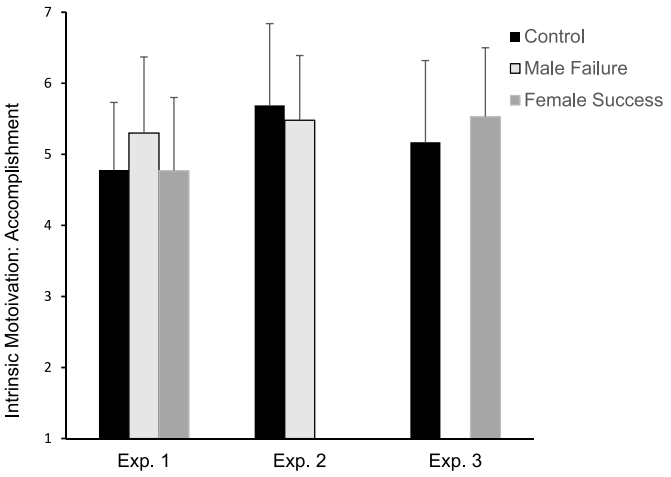

Fig. 1. Main Effects of the Stereotype Lift (Experiment 1) and Stereotype Boost Condition (Experiment 3) on Intrinsic Motivation – Accomplishment. Experiment 2 shows a reversed pattern (Stereotype Threat Effect; not significant).

3.2.2. Self-efficacy

In line with Hypothesis 2b, an ANOVA revealed that participants in the male failure group rated themselves significantly higher on the self-efficacy scale than participants in the control group or the female

Table 2
Bivariate correlations of experiments 1, 2, and 3.

	Experiment	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3	4	5
		r	r	r	r	r	r	r	r	r	r
1	1	-.41**	.01	.05	.19*	.34**	.50**	.34**	.10	-.00	.01
	2	-.34**	-.17*	-.03	-.02	.15	.23**	.27**	.07	.19*	-.14
	3	-.18*	.08	.19*	.28**	.41**	.31**	.29**	.18*	.11	.05
2.1	1	–	.12	.00	-.24**	-.31**	-.36**	-.44**	-.20*	-.21*	-.04
	2	–	.23**	.13	-.04	-.42**	-.40**	-.36**	-.12	-.21*	.12
	3	–	.27**	-.01	-.16	-.29**	-.23**	-.40**	-.29**	-.24**	.03
2.2	1		–	.29**	.31**	.11	.15	.17	.10	.23*	.26**
	2		–	.44**	.39**	.04	.07	.05	.00	.16	.21*
	3		–	.43**	.24**	.09	.08	.13	.07	.01	.11
2.3	1			–	.15	.07	.15	.10	.13	.07	.09
	2			–	.41**	.13	.15	.06	.06	-.06	.09
	3			–	.35**	.26**	.28**	.23**	.12	.04	.02
2.4	1				–	.44**	.31**	.36**	.32**	.15	.16
	2				–	.34**	.28**	.32**	.11	-.00	.07
	3				–	.49**	.40**	.43**	.08	.20*	.16
2.5	1					–	.73**	.57**	.31**	.07	.06
	2					–	.65**	.51**	.16	.13	-.04
	3					–	.70**	.50**	.12	.23**	.15
2.6	1						–	.60**	.28**	.08	.08
	2						–	.48**	.18*	.21*	.04
	3						–	.53**	.13	.21*	.18*
2.7	1							–	.31**	.16	.03
	2							–	.26**	.30**	.16
	3							–	.29**	.24**	.11
3	1								–	.30**	.08
	2								–	.28**	.22**
	3								–	.38**	-.18*
4	1									–	.41**
	2									–	.38**
	3									–	.33**

Notes. 1. Self-Efficacy; 2.1 Amotivation; 2.2 EM: external regulation; 2.3 EM: introjected regulation; 2.4 EM: identified regulation; 2.5 IM: to know; 2.6 IM: accomplishment; 2.7 IM: stimulation; 3. Sports-related behavioral intentions; 4. Instagram Behavioral Intentions; 5. Instagram Intensity; *$p < .05$; **$p < .01$

success group, $F(2, 114) = 4.48$, $p = .013$, $\eta_p^2 = 0.073$. In contrast to Hypothesis 2a, the female success group did not differ from the control group.

3.2.3. Sports-related behavioral intentions

In contrast to Hypotheses 3a and 3b, an ANOVA revealed no significant difference between participants in the control group, the female success group, and the male failure group regarding their sports-related behavioral intentions, $F(2, 114) = 0.80$, $p = .45$, $\eta_p^2 = 0.014$.

3.3. Discussion

The results of Experiment 1 provide evidence that the display of sport failures on Instagram can have positive consequences for members of the outgroup, as it can increase users' self-efficacy and aspects of their intrinsic motivation. This provides support for a stereotype lift effect. The effects were small, yet significant. However, neither the exposure to female sport success nor male sport failure had an influence on participants' sports-related behavioral intentions, suggesting that the present boost and lift manipulations did not momentarily influence athletes' domain identification.

Problematically, we experienced more dropout than expected, which reduced the sample size, and consequently, the power of this experiment. However, the results remain unchanged when we include all participants who completed the experiment and practice their sport on a competitive level into our analyses ($n = 154$). As our sample consisted of young female elite German athletes, the generalizability of our findings might be limited by gender and culture. The participants came from various sports disciplines; however, we cannot determine whether this had an influence on how participants responded to the images related to sport success or failure. Depending on the momentary salience of the respective social identity (e.g., woman, athlete, team player, sports representative of their country), the posts may have influenced participants differently. Therefore, we decided to run a follow-up experiment, extending the research to another country (i.e., Norway) and narrowing the focus to two experimental conditions as a closer examination of the stereotype lift effect with posts of male sports failures and a gender-neutral control condition.

4. Experiment 2

We intended to examine whether the stereotype lift effects of Experiment 1 translate into a different cultural context. To this end, we recruited Norwegian female elite athletes (World Economic, 2020). Despite Norway being one of the most gender-equal countries in the world, media coverage still underrepresents women in sports, with stereotypes and trivialization ever-present (Hovden & von der Lippe, 2019). We opted for a two-group between-subjects design and focused on the male failure condition based on the results of Experiment 1. The experiment was preregistered under https://aspredicted.org/4ia6r.pdf . In line with Experiment 1, we hypothesized that participants in the male failure condition would show higher athletic motivation (Hypothesis 1), higher self-efficacy (Hypothesis 2), and greater sports-related behavioral intentions in the future (Hypothesis 3) than participants in the control condition.

4.1. Method

4.1.1. Instagram posts

Participants were randomly assigned to one of the two experimental conditions (male failure vs. control). As in Experiment 1, we created four fictional Instagram posts for each condition, keeping the number of "likes" and the Instagram account ("Olympicteamnorway") constant. All post depicted actual sports events or failures and included the hashtag #teamnorway. In the male failure condition, the participants read the following information: "Last year, in international competitions, Norwegian male athletes performed on average worse than Norwegian female athletes. Here are a few examples." They then saw four failures of male professional athletes (e.g., the Norwegian handball team losing during the handball world championship). In the control condition, participants read the following information: "Norwegian female and male athletes participate in international competitions. Here are a few examples." They then saw four gender-neutral posts of international sports events or gender-mixed teams (e.g., the Olympic Games in Japan). The complete stimulus material is provided in the OSF repository (https://osf.io/tjp7y/).

4.1.2. Measures

The same scales as in Experiment 1 were used to assess Instagram use (*Instagram Intensity Scale,* Stapleton et al., 2017), self-efficacy (*New General Self-Efficacy Scale*, Chen et al., 2001), and athletic motivation (*Sport Motivation Scale*, Pelletier et al., 1995) with the subscales amotivation, extrinsic motivation (EM: external, introjected, and identified regulation), and intrinsic motivation (IM: to know, to accomplish things, and to experience stimulation). We also assessed sports-related behavioral intentions and Instagram behavioral intentions with the same items as in Experiment 1. Reliability indices are provided in Table 1. All measures can be found in the OSF repository (https://osf.io/tjp7y/).

4.1.3. Participants and procedure

Based on Experiment 1, we expected a small effect. Under the assumption of an effect size of $\eta^2 = 0.088$, two groups, three DVs, $\alpha = 0.05$, and $1\text{-}\beta = 0.80$, the optimal sample size includes a total of $N = 118$ (G*Power; Faul et al., 2007). We intended to oversample by 20% to offset potential dropout and technical problems. Participants ($N = 179$) were recruited via sports teams and high schools in Norway, targeting specifically young female elite athletes (i.e., using email lists and social media). After excluding respondents (all exclusion criteria were preregistered) because they did not complete the experiment ($n = 2$), did not indicate their gender or were male ($n = 2$), did not practice their sport on a competitive level ($n = 4$), or failed to correctly answer at least two of the three attention check questions ($n = 34$), the final sample consisted of $n = 137$ female participants (age range: 18–56 years, $M = 22.83$ years, $SD = 6.67$). Much of the sample was highly educated ($n = 70$ students with bachelor, master, or PhD). The majority of participants competed at least at the national level (Competition levels: club: $n = 4$; county: $n = 7$; regional: $n = 10$; national: $n = 44$; European: $n = 18$; world: $n = 54$). The sample included athletes who competed in individual sports such as cross-country skiing, weightlifting, judo, or gymnastics ($n = 73$) and team sports such as soccer, handball, basketball, or volleyball ($n = 64$). Most participants indicated that they use or have used Instagram ($n = 135$) and followed at least one sports page on Instagram ($n = 131$). The procedure was analogous to Experiment 1. Instructions and measures were presented in Norwegian. All participants gave their informed consent. Participation was voluntary and anonymous, adhering to local ethical and data protection guidelines. The experiment was ethically approved by the internal board for research ethics at the second author's institution.

4.2. Results

For descriptive results see Table 1; correlation coefficients are provided in Table 2. Deviating from the preregistration, we decided to run additional exploratory analyses with a smaller subsample of highly identified athletes ($n = 116$), that is, those who compete at least on a regional level. This decision was based on the fact that stronger effects may be expected among individuals who identify more strongly with the domain. Based on the optimal sample size calculation we set the cut-off at regional level and above.

4.2.1. Athletic motivation

A MANOVA with experimental condition (male failure vs. control) as

the predictor and the seven subscales of athletic motivation as the criteria was conducted. There was no significant multivariate main effect, $F_{Wilks\text{-}Lambda}(7, 129) = 1.01$, $p = .430$, $\eta_p^2 = 0.052$. An inspection of the univariate effects revealed a significant difference regarding the subscale "Amotivation", $F(1, 135) = 6.50$, $p = .012$, $\eta_p^2 = 0.046$. The male failure condition showed higher means in amotivation than the control condition. Exploratory analyses showed that among athletes who competed at regional competition level and above ($n = 116$), this effect became even more pronounced, $F(1, 114) = 8.06$, $p = .005$, $\eta_p^2 = 0.066$. Higher competition level participants in the male failure group ($n = 59$) also tended to report lower motivation on the subscale "IM - to know" compared to the control group ($n = 57$), $F(1, 114) = 3.28$, $p = .073$, $\eta_p^2 = 0.028$. These results are in contrast to Hypothesis 1.

4.2.2. Self-efficacy

Participants in the male failure group rated themselves significantly lower on the self-efficacy scale than participants in the control group, $F(1, 135) = 5.31$, $p = .023$, $\eta_p^2 = 0.038$. Again, exploratory analyses revealed that among athletes who competed at a higher level, this effect became even more pronounced, $F(1, 114) = 7.08$, $p = .009$, $\eta_p^2 = 0.058$. This finding is in contrast to Hypothesis 2.

4.2.3. Sports-related behavioral intentions

In contrast to Hypothesis 3, there was no significant difference in participants' sports-related behavioral intentions, $F(1, 135) = 0.44$, $p = .508$, $\eta_p^2 = 0.003$.

4.3. Discussion

Results of Experiment 2 differed from our predictions and from the results in Experiment 1. In contrast to what we predicted, female elite athletes in Norway who were exposed to (fictional) Instagram posts that showed Norwegian male professional athletes failing did not respond with an increase in athletic motivation, self-efficacy, or behavioral intentions for their future in sports. In contrast, results from Experiment 2 showed that participants in this condition reported higher levels of amotivation and lower self-efficacy compared to the control group. It appears that exposing female elite athletes in Norway with failures of their male colleagues caused negative instead of the expected positive effects. This might be the case because Norway is one of the most gender egalitarian countries in the world (World Economic, 2020). Actively engaging in sports is common for both men and women in Nordic countries (van Tuyckom et al., 2010). In addition, Norway is a small country with a limited number of elite athletes; thus, men and women may more often train and travel together compared to larger countries such as Germany (see for example NTB, 2014). All of these factors might have contributed to an increased salience of nationality instead of gender in the experimental condition. As a consequence, this may have led our female participants to perceive the failing male professional athletes as failing ingroup group members (i.e., Norwegian athletes) instead of outgroup members (i.e., men). The manipulation in this experiment might therefore have led to a stereotype threat effect, rather than a stereotype lift effect, and thus caused the observed decrease in motivation and self-efficacy.

In order to gain a better understanding of whether the missing effect was indeed due to the specific manipulation in Experiment 2 or a more general effect, we conducted another follow-up experiment to test whether exposing young female Norwegian elite athletes to pictures of female sports successes would foster their athletic motivation, self-efficacy, and sports-related behavioral intentions (i.e., a stereotype boost effect).

5. Experiment 3

While Experiment 2 focused on stereotype lift, we now aimed at examining potential stereotype boost effects. Thus, in Experiment 3, we opted for a two-group between-subjects design, focusing on the female success condition. We recruited a second, independent sample of Norwegian female elite athletes. The experiment was preregistered under the OSF (https://osf.io/tjp7y/). We hypothesized that participants in the female success condition would show higher athletic motivation (Hypothesis 1), higher self-efficacy (Hypothesis 2), and greater sports-related behavioral intentions in the future (Hypothesis 3) than participants in the control condition.

5.1. Method

5.1.1. Instagram posts

Again, participants were randomly assigned to one of the two experimental conditions (female success vs. control). As in Experiment 1 and 2, we created four fictional Instagram posts for each condition, keeping the number of "likes" and the Instagram account ("Olympicteamnorway") constant. All post depicted actual sports events or successes and included the hashtag #teamnorway. In the female success condition, the participants read the following information: "Last year, in international competitions, Norwegian female athletes performed on average better than Norwegian male athletes. Here are a few examples." They then saw four successful female professional athletes (e.g., downhill skiing bronze medalist Ragnhild Mowinckel). The control condition was analogous to Experiment 2, but included different pictures of recent sports events, as some of the sporting events which were displayed in Experiment 2 had already taken place by the time we conducted Experiment 3.

5.1.2. Measures

The same measures were used as in Experiment 2. Reliability indices are provided in Table 1. All measures and material can be found in the OSF repository (https://osf.io/tjp7y/).

5.1.3. Participants and procedure

The a-priori sample size calculation (G*Power; Faul et al., 2007) and recruitment strategy from Experiment 2 was applied. Out of $N = 196$ initial participants, $n = 13$ people who had already participated in Experiment 2 were excluded. After excluding respondents (all exclusion criteria were preregistered) because they did not complete the experiment ($n = 2$), did not indicate their gender or were male ($n = 3$), did not practice their sport on a competitive level ($n = 20$), or failed to correctly answer at least two of the three attention check questions ($n = 15$), the final sample consisted of $n = 143$ female participants (age range: 18–60 years, $M = 22.59$ years, $SD = 4.63$). Again, most participants were highly educated ($n = 112$ students with bachelor, master, or PhD) and competed at least at the national level (Competition levels: club: $n = 9$; county: $n = 18$; regional: $n = 23$; national: $n = 58$; European: $n = 13$; world: $n = 22$). The sample included athletes who competed in individual sports, including cross country skiing, weightlifting, judo, and gymnastics ($n = 33$) and team sports, including soccer, handball, basketball, and volleyball ($n = 110$). All participants indicated that they use or have used Instagram ($n = 143$) and most followed at least one sports page on Instagram ($n = 137$). The procedure was analogous to Experiments 1 and 2. In addition to the ethical approval by the internal board for research ethics at the second author's institution, Experiment 3 received approval from the Norwegian center for research data (NSD).

5.2. Results

For descriptive results see Table 1; correlation coefficients are provided in Table 2. All analyses were performed analogously to Experiment 2. Again, deviating from the preregistration and comparable to Experiment 2, we ran additional exploratory analyses with a smaller subsample of higher identified athletes (regional competition level and above, $n = 93$).

5.2.1. Athletic motivation

A MANOVA with experimental condition (female success vs. control) as the predictor and the seven subscales of athletic motivation as the criteria yielded no significant multivariate main effect, $F_{Wilks\text{-}Lambda}(7, 135) = 1.68$, $p = .120$, $\eta_p^2 = 0.080$. Concerning the subscales, there was a significant difference regarding the subscale "IM – accomplishment", $F(1, 141) = 3.98$, $p = .048$, $\eta_p^2 = 0.027$ (see Fig. 1). The female success condition showed higher means than the control condition. Exploratory analyses showed that among athletes who compete at a higher level ($n = 93$), this effect became even more pronounced, $F(1, 91) = 6.62$, $p = .012$, $\eta_p^2 = 0.058$, with the subscale "IM - to know" trending into the same direction, $F(1, 91) = 3.24$, $p = .075$, $\eta_p^2 = 0.034$. This partly supports Hypothesis 1.

5.2.2. Self-efficacy

In contrast to Hypothesis 2, the female success group and the control group did not show a significant difference in their self-efficacy ratings, $F(1, 141) = 0.62$, $p = .432$, $\eta_p^2 = 0.004$.

5.2.3. Sports-related behavioral intentions

There was no significant difference regarding participants' sports-related behavioral intentions, $F(1, 141) = 2.51$, $p = .115$, $\eta_p^2 = 0.017$. However, exploratory analyses revealed that among athletes who competed at a higher level, participants in the female success group ($n = 58$, $M = 5.59$, $SD = 1.11$) reported more sports-related behavioral intentions compared to the control group ($n = 35$, $M = 4.89$, $SD = 1.00$), $F(1, 91) = 9.55$, $p = .003$, $\eta_p^2 = 0.095$, providing partial support for Hypothesis 3.

5.3. Discussion

In contrast to the results of Experiment 2, the results of Experiment 3 were mostly in line with our predictions: Female elite athletes who were exposed to winning ingroup members reported higher intrinsic motivation compared to the control group, indicating a stereotype boost effect. In addition, a subgroup of participants of Experiment 3 (those who were competing at the regional level or higher and are therefore expected to be more strongly identified with the domain) showed an increase in sports-related behavioral intentions for the future when exposed to female sport success compared to the control group.

6. General discussion

Can pictures on Instagram that display the success and failure of professional athletes affect the athletic motivation, self-efficacy, and sports-related behavioral intentions of young female elite athletes? Taken together, the results of three studies provide evidence that the exposure to social media posts of ingroup members' successes and outgroup members' failures can affect female elite athletes' motivation and self-efficacy. Results from Germany showed that images of outgroup members' sport failures on Instagram can have positive consequences for women, as it can increase users' perception of their self-efficacy and aspects of their intrinsic motivation (lift effect). In Norway, we found that whereas exposure to failures of men in sports had a negative effect on female elite athletes' self-efficacy and motivation (potentially because they turned into a threat effect), exposure to the success of female professional athletes had the predicted positive effects (boost effect). Thus, Instagram's aim to inspire and motivate its users may be fulfilled – at least under certain boundary conditions. The identification of users with certain social groups along with the momentary salience of that identity appears to be an important factor that determines whether Instagram posts inspire or backfire.

Interestingly, in both Experiment 1 and Experiment 3 we found positive effects of Instagram posts on the same two subscales of the motivation scale, namely on "IM – accomplishment" and "IM – to know". Whereas the first subscale focuses on positive emotions that arise from working on ones' sports performance (e.g., mastering a difficult training technique), the second one focuses on the positive emotions that arise from gaining more knowledge about one's sport (Pelletier et al., 1995). Thus, both focus on the positive intrinsic feeling that an athlete associates with improving in the sports domain. In contrast, the surprising effect we found in Experiment 2 was observed on the subscale "Amotivation". This subscale focuses on athletes' doubts about their sports abilities (e.g., feelings of incompetence and lack of control; Pelletier et al., 1995). Thus, when Norwegian female elite athletes were confronted with Norwegian male professional athletes' failures, this increased their doubts about their own performance. Worrying and doubting one's own abilities is one of the main psychological processes that have been proposed to underlie stereotype threat effects (Schmader & Beilock, 2012). Therefore, this again points towards our previous argument that Norwegian female elite athletes perceived the failure of Norwegian male professional athletes as failures of ingroup members (i.e., Norwegians), and thus, that our manipulation triggered stereotype threat instead of the intended stereotype lift effects.

6.1. The importance of social identity and domain identification

As outlined in the Discussion of Experiment 2, the differences in the results between Experiments 2 and 3 might be due to Norway being a small and very gender egalitarian country (World Economic, 2020), in which female and male athletes spend more time together, and thus form a more coherent group than in larger countries like Germany. The high level of gender equality in the country along with the joint efforts of Norwegian athletes, regardless of their gender, may lead to a higher identification of female elite athletes with "Norwegian athletes" instead of "female athletes". Thus, the competition between women and men might be less salient than in other countries. Therefore, the manipulation used in Experiment 2, that is, showing failures of male Norwegian athletes, might have made nationality rather than gender the salient social identity. This may have led our female participants to perceive the failing male professional athletes as ingroup members, resulting in a stereotype threat effect. In contrast, in Experiment 3, the successes of female Norwegian athletes portrayed included both their national (i.e., Norwegian) and their gender identity. For this reason, we found small but significant stereotype boost effects in the second experiment. Similar effects have been found for Asian women regarding their math ability (Shih et al., 1999): When their positively regarded Asian identity was salient, performance increased (boost effect), whereas when their negatively regarded female identity was salient, performance decreased (threat effect).

Further, in our exploratory analyses, we found more pronounced effects for athletes who competed at a higher level in Experiments 2 and 3. We suggest that a higher competition level also indicates a higher level of identification or involvement in one's sport (cf. Robins & Hetherington, 2005; Rottensteiner et al., 2015). This aligns with previous findings showing that strong domain identification is an important precondition for stereotype threat effects to occur (for a review see Steele et al., 2002), which may also apply to boost and lift effects.

6.2. Limitations and future research directions

Despite our contribution to the literature, some aspects limit the scope and generalizability of our research. While the dependent variables motivation and future behavioral intentions were rather specific to the athletic domain, this does not apply to the operationalization of self-efficacy, which was assessed more generally. However, we assume that the assessment in the present sports-context contributed to a sports mind-set in which participants answered the general self-efficacy scale in relation to their sports self-efficacy. Still, we would like to encourage researchers in future studies to measure self-efficacy in the athletic domain instead of general self-efficacy, as this may provide clearer results. Next, our samples only represent a small selection of female elite

athletes in Norway and Germany. Additionally, our participants were quite young and rather active Instagram users. Further, we only examined Instagram posts as stimulus material. This limits the generalizability of our findings to other countries, subsamples of athletes, and social networking sites. It is also unknown how male elite athletes may react to Instagram posts portraying sports successes and failures of ingroup and outgroup members. We suggest that the selection of the outgroup is highly important in this context, as it is necessary to choose a group that people actually compare themselves with. For women, this may be men (at least under certain circumstances, as demonstrated in the present research), whereas for men, this may instead be different ethnicities (as demonstrated in Stone et al., 2012).

Stereotypes about males and females may vary in their accessibility. As sports have been shown to be a largely male-oriented domain (e.g., Gentile et al., 2018; Riemer & Visio, 2003), it may have been difficult for our participants to believe that women outperformed men in international competitions. Further, different sports can be categorized as stereotypically male, female, or gender-neutral. Stereotypically male sports are characterized by strength, aggressiveness, and physical contact, whereas aesthetics, grace, and expressiveness signify stereotypically female forms of sport (Chalabaev et al., 2013). The meta-analysis that revealed a stereotype threat effect in sports for women showed that this effect was particularly visible for sports or physical tasks that were stereotypically male (Gentile et al., 2018). Therefore, we suggest that this distinction may also play a role in stereotype lift and boost effects.

In contrast to televised media sports coverage, where substantial gender stereotyping occurs (e.g., Koivula, 1999), social media provides a platform on which athletes, regardless of their gender, can tell their own stories and create the frames and environments that they want to be seen in. Some female athletes regard this as an opportunity to challenge gender stereotypes. Researchers have observed social media trends that challenge gender stereotypes in women's sports, such as the portrayal of women as athletically competent under the hashtag of #shebelieves during the soccer World Cup 2015 (Pegoraro et al., 2018). Yet, by and large, athletes' self-presentations on Instagram stick to established gender norms (Romney & Johnson, 2020; Smith & Sanderson, 2015), and instead perpetuate gender stereotypes (e.g., pro golfer Paige Spiranac). In the current research, we focused on (fictional) Instagram posts which were communicated by sporting organizations (Experiment 1: "Teamdeutschland"; Experiments 2a and 2b: "Olympicteamnorway") instead of individual athletes. It remains an open research question as to whether the creator of the posts may influence how recipients perceive and react to displays of gender stereotypes, successes, or failures in the sports domain.

Finally, the obtained effects in our studies were restricted to aspects of intrinsic motivation and self-efficacy and only small in size. Nevertheless, we argue that even such small effects bear practical relevance; they substantiate the assumption that media displays of gender stereotypes in sports affect recipients' self-evaluation. As our experiments show, these effects may go in both directions, and either inspire athletes to pursue their goals, or backfire and undermine their motivation.

Declaration of interest

The authors declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.psychsport.2021.102080.

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