Counteracting subliminal cues that threaten national identity

Jolien A. vanBreen[1]* , Soledad deLemus[2], Russell Spears[3] and Toon Kuppens[3]

[1]Universiteit Leiden, the Netherlands
[2]Universidad de Granada, Spain
[3]Rijksuniversiteit Groningen, the Netherlands

In spite of their subtle nature, subliminal cues of group devaluation can have profound effects on members of targeted groups. Across three studies, we examine factors that allow people to counteract subliminal cues of group devaluation. We do this in the context of Spanish–German intergroup relations following the 2008 financial crisis. Throughout the crisis, narratives in politics and the media have drawn on national stereotypes to legitimize the economic situation in Spain. We argue that this represents a threat to our Spanish participants and that exposure to subliminal cues that reflect this threat will trigger responses that counteract this threat. Indeed, results showed that when subliminal associations legitimize the disadvantage faced by the group, our Spanish participants *reversed* the subliminal associations to which they were exposed. These findings show that Spanish participants are able to counteract the devaluation of their national in-group, even when that devaluation occurs outside of conscious awareness.

There is evidence that, in many Western societies, social devaluation of disadvantaged groups is becoming increasingly subtle (Pearson, Dovidio, & Gaertner, 2009; Swim, Aikin, Hall, & Hunter, 1995). Changes in societal norms mean that it is increasingly unacceptable to express prejudicial attitudes explicitly (Crandall & Eshleman, 2003; but see Betz & Johnson, 2004), but the fact that these attitudes are not expressed explicitly does not mean they have disappeared. In fact, processes that contribute to social devaluation, such as stereotyping, can occur subliminally (Blair, 2002; Cañadas, Rodríguez-Bailón, Milliken, & Lupiáñez, 2013; Devine, 1989). That is, behaviour and cognition can be significantly biased without either the perpetrator or the victim being consciously aware of it. In this paper, we examine the coping mechanisms people employ to deal with subliminal cues of devaluation facing their group.

Even when it is very subtle, social devaluation has far-reaching effects on interactions. On the side of the perpetrator, seminal work by Devine (1989) showed that subliminal exposure to race-related words activates stereotype constructs, which then biased participants' impressions of novel individuals in stereotype-consistent ways.

*Correspondence should be addressed to Jolien A. van Breen, Universiteit Leiden, Leiden, the Netherlands (email: j.a.van.breen@fgga.leidenuniv.nl).

These processes also affect members of target groups: Black participants showed poorer performance after having interacted with White partners who hold implicit anti-Black biases (Holoien & Shelton, 2012). These findings suggest that the subtlety of subliminal devaluation cues belies the harmful effect they have on those who are targeted by them.

In light of this, considerable research has examined how people cope when they are exposed to subliminal cues that devalue the groups to which they belong. On the one hand, there is evidence that – as cues of group devaluation become subtler – they are more difficult to recognize and difficult to confront directly (Kray, Thompson, & Galinsky, 2001; Major, Quinton, & Schmader, 2003). That is, when cues are very subtle, or even subliminal, members of the target group seem to have little choice but to assimilate. More recently, however, there is growing evidence that people *can* counteract subliminal cues of devaluation. This is in part due to increasing recognition that there are many different strategies by which members of the target group can counteract group devaluation, including a host of indirect and subtle strategies in addition to the more well-known such as protest and interpersonal confrontation. For instance, it has been shown that members of disadvantaged groups can counteract that disadvantage through their behaviour. Crisp, Bache, and Maitner (2009) asked engineering students to complete a math task which ostensibly reflected gender differences and found that the female students performed *better* than their male peers. We might interpret this as counteracting the stereotype – women demonstrate that the stereotype is untrue through their own counter-stereotypical behaviour. Further, tendencies to counteract group-based devaluation can be expressed on implicit measures, without the need for conscious awareness. Ramos et al., (2016) exposed women and men to sexism and showed that following this exposure, female participants in particular showed evidence for a *reduction* in implicit gender bias. Rather than going along with the sexism to which they were exposed, they instead opposed it (see also de Lemus, Spears, Bukowski, Moya, & Lupiáñez, 2013; de Lemus, Spears, Lupiáñez, Bukowski, & Moya, 2018). Likewise, following social threats, implicit mechanisms can be drawn on to buffer self-esteem (Leitner & Forbes, 2015). The notion that tendencies to counteract devaluation can be expressed in implicit measures is supported by developments in the literature on implicit cognition, which has shown that motivational processes can operate outside of conscious awareness (Custers & Aarts, 2010; Moskowitz, Li, Ignarri, & Stone, 2011). In sum, then, there is increasing evidence that the desire to counteract and oppose the devaluation of one's in-group can be expressed in subliminal or implicit processes.

However, the work discussed above does not speak directly to cases where the threat itself is conveyed subliminally. Recent research from our own laboratory directly examined the question whether tendencies to counteract in-group devaluation can take place when exposure to devaluation occurs subliminally (van Breen, Spears, Kuppens, & de Lemus, 2018). This work showed that exposure to subliminal cues of devaluation triggers responses designed to counteract that devaluation. Following subliminal exposure to gender stereotypes, feminist women showed counter-stereotypical behaviour, and the subliminal prime 'woman' facilitated the recognition of positive (rather than negative) words. That is, instead of 'going along' with the negative and stereotypical representation of the group, feminist women *reversed* the associations to which they were exposed (van Breen et al., 2018). In sum, it seems that it is possible to counteract subliminal cues of devaluation. The current work examines some of the conditions necessary to allow people to counteract subliminal cues of devaluation.

We argue that people are able to counteract subliminal forms of devaluation if such cues tap into a salient threat to the group. Research has shown that subliminal social cues

become much more consequential when they do not stand alone, but rather tap into an issue that is meaningful to the individual (Amir, Foa, & Coles, 2000; Strahan, Spencer, & Zanna, 2002). Threat is a powerful motivational force in both social and non-social contexts and can be detected even when conveyed through subliminal cues (Amir et al., 2000; Kaiser, Vick, & Major, 2006; McNally, Amir, & Lipke, 1996). For instance, it has been shown that subliminal prejudice cues have a greater effect on those who expect to be the target of prejudice (Kaiser et al., 2006). As such, exposure to subliminal cues might still produce relatively sophisticated responses, by triggering strong motivating factors such as threat. We argue that people are more able to counteract subliminal devaluation cues when those cues serve as reminders of an existing threat to the group. We examine this idea in the context of Spanish national identity following the 2008 financial crisis.

The 2008 financial crisis in Spain

The financial crisis has had clear effects across the European Union, but particularly so in Southern European countries, including Spain, but also Greece, Italy, and Portugal. Germany (alongside the Netherlands and the UK) is perceived to have played an important role in enforcing far-reaching austerity in Southern Europe (see van Hecke, 2017; Sierp & Karner, 2017). In the context of the 2008 economic crisis, then, Germany is a salient out-group to our Spanish participants.

The context of Spanish–German intergroup relations is particularly suited to examine the central hypothesis of this study – that even subliminal cues of devaluation can be counteracted *if* they tap into particularly threatening elements of the devaluation context. Our design requires different kinds of negative group representations which differ in the level of threat they represent. Normally, this would require different contents – so that some content is more threatening than other content. However, in the Spanish–German intergroup context, we are able to vary the threatening nature of the associations with only minimal variations in content, as explained below.

Since the onset of the financial crisis, Spanish–German intergroup relations have been characterized, first, by considerable economic disadvantage for Spain. In addition, the intergroup context is characterized by national stereotypes (Linssen & Hagendoorn, 1994; Pennebaker, Rimé, & Blankenship, 1996; Willis & Rodríguez-Bailón, 2008). When stereotypes are used in a purely descriptive sense, they are not necessarily problematic, because they provide a sense of 'what it means' to be a group member (Gómez, Seyle, Huici, & Swann, 2009). Indeed, previous research has shown that Spanish participants are quite willing to endorse national stereotypes of their own group and do not necessarily perceive this negatively (Morales, García, Rodríguez-Bailón, & Moya, 2004). Crucially for the current study, however, stereotypes can also serve a legitimizing function – that is, stereotypes can be used to provide a justification for the status hierarchies within society and the inequalities these produce (Reyna, Henry, Korfmacher, & Tucker, 2006; Weiner, 1995). Indeed, this seems to be what has occurred in the context of the financial crisis: Narratives in politics and the media have attempted to explain Spain's disadvantage with reference to national stereotypes (see Sierp & Kanner, 2017). For instance, it has been suggested by newspaper commentators that the economic situation in Spain was due to 'poor work ethic' (Bloom, 2015; Brooks, 2011; Friedman, 2011). This is a powerful way to legitimize inequality, because the traits invoked by stereotypes are perceived as causal factors in producing a group's outcomes (Kressel & Uleman, 2015; Reyna et al., 2006). In other words, stereotypes can be used to assign blame and responsibility for disadvantage to the disadvantaged group (Capucha, Estêvão, Calado, & Capucha, 2014; Weiner, 1995).

At the time when these studies were conducted, this supposed legitimacy associated with the economic crisis formed a very salient threat to national identity within Spain (Becker, Wagner, & Christ, 2011; Bukowski, de Lemus, Rodriguez-Bailón, & Willis, 2017). The salience of this threat can be seen for instance in the fact that people began to retaliate against such narratives in the media (as can be seen from this Twitter thread). In sum, the context of the financial crisis in Spain is associated with a form of identity threat that arises not from references to the financial crisis *per se* or from references to stereotypes *per se,* but rather their combined effects, whereby stereotypes are used to imply that the disadvantage faced by the in-group is legitimate.

The current studies
Across three studies, we expose Spanish participants to subliminal cues that reflect negatively on the national in-group. We expect that participants will counteract those cues that make the in-group responsible for the disadvantage they face. Participants are expected to be especially sensitive to such cues, because – even though they are subliminal – they tap into a salient dimension of threat in people's daily lives.

To manipulate subliminal exposure to cues of group devaluation, we use a priming procedure. That is, participants are exposed to subliminal in-group or out-group primes (Spanish/German) that are paired with supraliminal target words[1]. A brief note is required here to clarify the terminology used. Throughout this paper, we use 'subliminal' to describe information that is presented with very brief presentation times, to be processed outside of conscious awareness. When describing responses and outcome measures, we use 'implicit' rather than 'subliminal' because the latter is a perceptual term and is not appropriate when discussing responses. All studies reported here were conducted in line with APA ethical guidelines, as well as institutional ethics requirements.

STUDY I
This study examines the notion that people can counteract subliminal forms of group devaluation, when those cues draw on (threatening) notions of blame and legitimacy. We use a priming procedure to expose Spanish participants to subliminal primes paired with supraliminal target words. Across conditions, these prime-target pairings reflect negatively on the in-group. In the *stereotype condition*, participants are subliminally exposed to low-competence stereotypes of the in-group (Spanish-lazy). In the *disadvantage condition,* participants are subliminally exposed to reminders of the financial crisis (Spanish-poor). In the *implied legitimacy condition,* these subliminal associations are combined, so that the in-group disadvantage is legitimized through the use of stereotypes (Spanish-lazy; Spanish-poor). Finally, we include a control condition that exposes participants to positive in-group associations (Spanish-efficient; Spanish-rich).

We expect that participants in the implied legitimacy condition will counteract the negative representation of the group. To measure these tendencies, we include, first, an evaluative decision task. Participants are asked to categorize words as positive or negative.

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[1] *Recently, there has been some controversy over the notion of priming (Doyen et al., 2012; Shanks et al., 2013). In light of this debate, it is worth emphasizing that in our case, the subliminal priming manipulation functions somewhat differently than traditional manipulations of this sort. Most importantly, our reasoning and predictions do not require any new associations or preferences to be established. Rather, our manipulation can function as a subliminal reminder of the stigmatizing messages to which people are exposed in their daily lives (except in the control condition, as outlined below).*

Each word is preceded by a subliminal prime, in this case 'Spanish' or 'German'. The in-group and out-group primes are presented subliminally, as they are during the manipulation. The outcome of interest is the influence of the subliminal prime (Spanish/German) on the speed with which people recognize positive and negative words. As such, this task enables participants to counteract the manipulation (which represents the group negatively) by more readily associating the in-group with positive words. We expect that (**H1**) after being exposed to the implied legitimacy condition, in-group primes (vs out-group primes) facilitate the recognition of positive targets. That is, we expect to observe a 3-way interaction between the manipulation, the target type (positive vs negative), and the prime type (in-group vs out-group). Second, we include a math task, which captures tendencies to counteract the manipulation through behaviour. Given that the manipulation represents the in-group as low in competence, we expect that people will counteract this by reasserting their competence. Specifically, we expect that following the implied legitimacy condition, people will (**H2**) show increased persistence in the math task (Nussbaum & Steele, 2007; van Breen et al., 2018), relative to the other conditions.

The subtle nature of the outcome measures we use provides a degree of 'structural fit' with the subliminal manipulation (Payne, Burkley, & Stokes, 2008). Put differently, a subtle manipulation is likely to produce subtle effects. Following this reasoning, we do not expect effects of our subliminal manipulation on more explicit coping responses. To generate some exploratory insight into this issue, we include three measures of more explicit coping responses, as a contrast to the more subtle outcome measures. We include a measure of in-group bias, a mood scale, and a measure of collective action – these are described in the Appendix S1. Finally, based on previous research (Ellemers, Spears, & Doosje, 1997; van Breen et al., 2018), we examine the role of in-group identification in our findings.

Method

Design & procedure
Upon arrival at the laboratory, participants read the study information and provided informed consent. Participants were randomly assigned to one of the four experimental conditions and completed the manipulation, followed by the central dependent variables: the evaluative priming measure and the math task. Participants then indicated their nationality and their identification with the national group. Participants then completed the exploratory measures (see Appendix S1). To end the study, participants completed a funnelled debriefing and were thanked for their participation.

Power
Previous research using a similar manipulation and dependent variables (van Breen et al., 2018) found effects of $d = 0.35$, with a lower bound of $d = 0.17$. As such, we wanted to ensure that our sample can detect effect sizes of around $d = 0.15$. The evaluative priming measure (described below) has a multilevel data structure, with multiple observations per participant. Power analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) does not allow estimation for multilevel models, but does offer estimation for a hierarchical RM ANOVA, which we use here. Given that this analysis does not fully incorporate the multilevel structure, it is likely to yield a relatively conservative estimate. Given $\alpha = 0.05$, 132 participants are required to detect simple effects of a small size ($d \approx 0.15$) with a

power of 1-β = 0.80. Based on this, we decided to collect a minimum of 132 participants. Maximum participant numbers were determined by the number of participants that could be recruited within a 2-week period. The additional participants provided a buffer in case not all participants met the inclusion criteria (i.e., Spanish nationality).

We then examined what a sample size of N = 132 would mean for the math task, which did not have a multilevel structure. A sensitivity analysis for these measures showed that, given α = .05 and a power of 1-β = .80, a sample of 132 participants can detect effects in the range of $d \approx 0.48$.

Participants

Undergraduates from the University of Granada (N = 163) completed the study. Those who did not have the Spanish nationality (N = 13) were excluded. We further excluded those who failed to comply with instructions or who had high error rates (>20%) during the manipulation (N = 9). This left a total of 141 participants (23 men; 16%), roughly equally distributed over the conditions ($N_{control}$ = 35; $N_{disadvantage}$ = 34; $N_{stereotype}$ = 38; $N_{implied\_legit}$ = 34). The average age was 20.50 years old, ranging from 18 to 45 years old.

Manipulation

The subliminal associations to which participants were exposed were manipulated by the repeated pairing of subliminal in-group and out-group primes with supraliminal target words. The subliminal primes were 'Spanish' (in-group) and 'German' (out-group). The supraliminal target words were selected based on a pre-test (see Appendix S1). We selected 10 low-competence traits rated as stereotypical for the Spanish in-group, and 10 high-competence traits that were rated as stereotypical for the German out-group, as well as 10 nouns reflecting economic disadvantage, and 10 nouns reflecting economic advantage.

These primes and targets were combined to create four different conditions. In the *stereotype condition*, participants were exposed to associations reflecting low-competence stereotypes of the in-group and high-competence stereotypes of the out-group, such as 'Spanish-lazy' and 'German-efficient' (see Linssen & Hagendoorn, 1994; Pennebaker et al., 1996). The *disadvantage condition* subliminally associated the in-group with targets relating to the economic disadvantage, such as 'Spanish-debt', while subliminally associating 'German' with 'credit' and 'wealth'. In the *implied legitimacy condition,* 'Spanish' was associated with *both* economic disadvantage *and* low-competence stereotypes (i.e., 'Spanish-lazy'; 'Spanish-debt') and 'German' was associated with both economic advantage and high-competence stereotypes ('German-efficient'; 'German-wealth'). This condition combines the associations used in the stereotype and disadvantage conditions. The fourth condition was a *control condition*, which was the same as the implied legitimacy condition except that Spanish and German primes were switched, such that 'German' was now associated with low competence and economic disadvantage, and 'Spanish' was associated with high competence and economic advantage. The associations participants saw in this condition then do not map onto any specific threat in participants' daily lives, as they represent the in-group positively. The purpose of this control condition was to match the implied legitimacy condition in terms of complexity (combining 2 types of associations).

The manipulation consisted of 120 trials, in which the subliminal prime ('Spanish' or 'German') was presented for 42 ms, with a supraliminal forward and backward mask

presented for 100 ms. Following the masked prime, the target appeared. The prime and masks appeared as a string of letters flashing on the screen, and the task instructions informed them: 'You will see some letters flash on the screen as the computer selects the target word from a list. Once the word appears, please answer the question below.' Participants were then asked to answer a question about the target word, to encourage deeper processing. Responses to the question were not analysed.

In-group identification

Based on previous research (de Lemus et al., 2013; van Breen et al., 2018), we included in-group identification as a covariate. Participants completed the multidimensional identification measure (Leach et al., 2008, $N = 14$, $\alpha = .93$) using a 9-point Likert scale.

Dependent measures

Evaluative priming measure.   We included an evaluative priming measure (Fazio, Jackson, Dunton, & Williams, 1995) to examine the positive and negative associations people make with the in-group and out-group. Participants saw positive or negative target words (supraliminal), preceded by subliminal in-group or out-group primes. The subliminal primes were 'Spanish' or 'German', as in the manipulation. The targets were positive or negative words without stereotypical connotations – such as 'love' or 'peace' – taken from the Spanish translation of the IAT measure (see Rodríguez-Bailón, Ruiz, & Moya, 2009). Participants were asked to classify these targets as positive or negative, as quickly as they could.

There were 4 different trial types depending on the prime-target pairing: in-group positive pairs, in-group negative pairs, out-group negative pairs, and out-group positive pairs. The task included 120 trials in total. The outcome of central interest is the speed with which people can recognize positive and negative words, and the influence of the primes on response times. Table 1 summarizes the subliminal and supraliminal components of Study 1.

Table 1. Overview of the priming procedures

	Example of associations		
	Subliminal prime (IG/OG)	Supraliminal target	
Manipulation	'Spanish'	Lazy	Stereo condition; Legit condition
	'German'	Productive	Stereo condition; Legit condition
	'Spanish'	Poor	Disadv condition; Legit condition
	'German'	Rich	Disadv condition; Legit condition
	'Spanish'	Rich	Control condition
	'German'	Lazy	Control condition
Eval priming measure	'Spanish'	Applause	
	'German'	Applause	
	'Spanish'	Tomb	
	'German'	Tomb	

Persistence and performance.   We included a math task, as a measure of persistence and performance in a competence domain to assess the desire to counteract devaluation through behaviour (Crisp et al., 2009; van Breen et al., 2018). The task consisted of 8 math problems in increasing order of difficulty. Participants were asked to choose the correct answer from 4 options. If they did not know the answer, participants could choose 'skip this question'. For the final item, the correct answer was not amongst the options, so that the item was unsolvable, yielding a measure of persistence – that is, the amount of time participants spent on the item before finally pressing 'skip'. Participants might counteract in-group stereotypes of low competence by persisting on the unsolvable item.

Analytical procedure

For the evaluative decision task, the simple comparison of central interest is the effect of the in-group prime versus the out-group prime on reaction times. We argue that after exposure to the implied legitimacy condition, subliminal in-group primes facilitate positive responses, *relative to out-group primes*. To evaluate evidence for this prediction, we fit a multilevel model including a random intercept for each participant, which reflects the multilevel structure whereby trials are nested within participants.

For the math task, we examine the effect of the manipulation on persistence and performance in the task. We argue that after exposure to implied legitimacy condition, participants will persist for longer and perform better, as a way of 'disproving' the negative image of the group to which they were exposed. We evaluate evidence for this prediction by fitting an ANOVA model, including the manipulation, group identification, and their interaction.

Preliminary analyses

It is common for reaction time (RT) data to be significantly skewed, as reaction times are constrained at the lower end of the scale, but not at the higher end of the scale. Indeed, the RT data for the evaluative decision task were negatively skewed (skewness = 15.96, kurtosis = 506.90). We took the following steps to address this issue. First, based on previous research, we considered that any response below 300 ms is an anticipation (Ratcliff, 1993), and these were excluded. At the higher end, we excluded the most extreme 10% of observations. That is, we chose an 'objective' cut-off rather than a data-based cut-off (Whelan, 2008). This approach was preferred because the same cut-off can be applied to any subsequent studies. Applying this cut-off to the data meant that any RTs above 900 ms were excluded, resulting in a distribution that was close to normal (skewness = 0.48; kurtosis = −0.016), with a median RT of 593 ms.

Preliminary analysis established that group identification could be used as a covariate, as it was not affected by the manipulation, $F < 1, p = .786$. Further, preliminary analysis of the evaluative priming measure confirmed the existence of a random Participant factor in the evaluative priming task, Wald's $Z = 7.64, p < .001$, reflecting the multilevel structure whereby trials are nested within participants. Therefore, the multilevel model described below includes a random Subject factor.

Pilot study

We argue that the tendency to associate in-group primes (more than out-group primes) with positive words represents a coping response. However, previous work has demonstrated

that under some circumstances, positive group associations are the default response (e.g., Otten & Moskowitz, 2000). To obtain some insight into this possibility, we conducted a pilot study with $N = 24$ participants, who were asked to complete the evaluative priming task in the absence of any manipulation. Analysis of this 'baseline' demonstrated that – in the absence of a manipulation, there was no evidence that the subliminal primes affected reaction times to positive and negative words, $F(1,2574) = 1.00$, $p = .317$. However, there was a main effect of target category, so that positive words elicited faster responses ($M = 599$) than negative words ($M = 610$), $F(1,2574) = 9.28$, $p = .002$.

Results

Evaluative priming task

Our hypothesis is that after exposure to the implied legitimacy condition, subliminal in-group primes (relative to out-group primes) facilitate the recognition of positive target words. The full model is shown in Table 2. The omnibus analysis showed a main effect of target valence: Positive targets ($M = 605$ ms) elicited faster responses than negative targets ($M = 613$ ms). The hypothesized 3-way interaction between the manipulation, target valence, and the group prime also reached significance, as did several of the lower order terms (see Table 2). There was no evidence for a further interaction with in-group identification, $F < 1$, $P = .316$.

Table 3 shows the breakdown of the 3-way interaction into simple effects – yielding one significant simple effect. After exposure to the implied legitimacy condition, positive targets were recognized more quickly when preceded by in-group primes ($M = 611$ ms) relative to out-group primes ($M = 621$ ms), supporting hypothesis 1. Figure 1 represents the interaction graphically.

Persistence and performance

We assessed whether people similarly counteracted the implied legitimacy condition through their behaviour, specifically through persistence and performance on a

**Table 2.** Full results for the evaluative priming measure in Study 1

Fixed Effect	*F*-value	df (denominator)	*p*-value
Intercept	18544.51	144	0.000
Manipulation [0 = control; 1 = stereo; 2 = disadv; 3 = implied legit]	0.49	141	0.687
Prime [0 = in-group; 1 = out-group]	0.31	14801	0.577
Target [0 = negative; 1 = positive]	15.96	144	0.000
Prime* Target	0.09	14802	0.763
Manipulation * Prime	3.19	14800	0.023
Manipulation * Target	4.42	141	0.005
Manipulation * Prime* Target	2.89	14802	0.034

Random effects	Wald Z	*p*-value	
Residual	85.99	0.000	
Intercept [subject = Subject]	7.59	0.000	

Note. The model also included, but does not display, the term reflecting identification with the national in-group and its interactions with the other terms.

Table 3. Simple effects in the evaluative priming measure in Study 1

Condition	Target valence	Group prime		M_{DIFF}	SE	p-value	95% CI	
		Spanish	German				Lower	Upper
Control	**Negative**	**613.12**	**601.36**	**11.76**	**4.24**	**.005**	**3.46**	**20.07**
	Positive	606.20	601.60	4.61	4.19	.271	−3.60	12.82
Stereotype	Negative	619.55	619.29	0.26	4.09	.950	−8.27	7.76
	Positive	597.45	597.54	−0.09	4.04	.982	−8.00	7.82
Disadvantage	Negative	602.59	609.20	−6.61	4.29	.124	−15.02	1.81
	Positive	605.21	598.27	6.95	4.29	.105	−1.46	15.35
Implied legitimacy	Negative	620.89	621.13	−0.23	4.58	.960	−9.20	8.74
	Positive	**610.65**	**620.61**	**−9.96**	**4.49**	**.026***	**−18.75**	**−1.16**
Across conditions	Across valences	608.62	609.46	0.84	1.51	.580	−2.13	3.80

Note. Significant effects are highlighted in bold. Simple effects marked with an asterisk are described in the text.
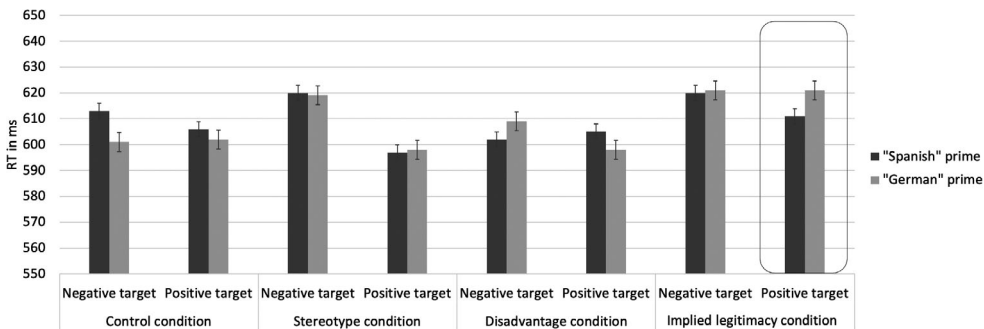
Figure 1. Reaction times in the evaluative priming measure. Error bars represent 1 standard error.

counter-stereotypical task. On average, participants gave 2.60 correct answers out of 7 (SD = 1.30) and spent 3 minutes on the task (SD = 1.9 min). Our hypothesis was not supported: There was no effect of the manipulation on either task performance, $F(3,141) = 2.12, p = .101$, or persistence $F < 1, p = .972$, on the unsolvable item.

Discussion
The central hypothesis of this study was that tendencies to counteract subliminal cues of devaluation will be triggered in the implied legitimacy condition. This condition makes the in-group responsible for the disadvantage they face and, as such, touches on a key element of threat for our Spanish participants. In line with this hypothesis, we observed that Spanish participants who were exposed to the implied legitimacy condition *reversed* the associations they were exposed to during the manipulation: After subliminal exposure to negative in-group associations, the subliminal prime 'Spanish' facilitated the recognition of positive words. The stereotype condition and the disadvantage condition did not produce such effects. Additionally, there was no evidence that people counteracted the manipulation through their behaviour on the math task.

STUDY 2

The aim of Study 2 was to replicate the finding from Study 1 that the implied legitimacy condition leads people to reverse the negative associations to which they were exposed, by making positive associations with the in-group more readily than the out-group (**H1**). In addition, we hypothesized that the implied legitimacy condition also triggers increased persistence on the math task (**H2**), reversing the stereotype implications of the manipulation.

As before, we also include a number of exploratory measures, such as measures of mood and collective action – there are described in more detail in the Appendix S1. We also include a new measure to gain insight how the implied legitimacy condition is interpreted. The implied legitimacy condition combines cues of in-group disadvantage with in-group stereotypes, in such a way that stereotypes seem to *legitimize* group disadvantage, making the Spanish in-group responsible for the disadvantage they face (Reyna et al., 2006). We now explore whether people do indeed perceive the legitimacy element, through a lexical decision task. Lexical decision tasks ask people to classify target stimuli as either words or non-words. We include words related to legitimacy (e.g., 'responsible') as well as filler words. The outcome of interest is how quickly people are able to recognize the legitimacy words relative to the filler words. Given that this was an exploratory measure, we did not raise a hypothesis. However, effects on this measure could take one of two forms. One the one hand, the implied legitimacy condition might trigger faster responses to legitimacy-related words (compared to filler words), as words that match primed concepts are recognized faster (Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000; McNamara & Healy, 1988). On the other hand, the implied legitimacy condition might trigger slower responses to legitimacy-related words (relative to filler words). In this study, legitimacy words acquire a threat component, and words that are associated with threat are known to slow down reaction times (Algom, Chajut, & Lev, 2004; Amir et al., 2000; Spears, Gordijn, Dijksterhuis, & Stapel, 2004).

Method

Design & procedure
The design and procedure of Study 2 were highly similar to Study 1. The primary difference was the inclusion of the lexical decision task (LDT), which was included in the procedure after the evaluative decision task, given that both are reaction time measures. The measure is described in detail below.

Power
Results from Study 1 confirmed that the effect of central interest here is small in size ($d = 0.18$). Given that the design of Study 2 is the same as in Study 1, power requirements for Study 2 were the same as in Study 1. That is, given $\alpha = .05$ and a power of $1\text{-}\beta = .80$, a minimum of 132 participants were required to detect simple effects of a small size for the dependent variables with multilevel structures (details below) and simple effects of a medium size for dependent variables that did not have a multilevel structure. Therefore, we decided to recruit a minimum of 132 participants. Maximum participant numbers were determined by the number of participants that could be recruited within a 2-week period.

Participants

Undergraduates from the University of Granada (N = 165) participated in this study. Those who did not have the Spanish nationality (N = 9) were excluded, as well as those who had high error rates during the manipulation (N = 3). This left a total of 152 participants in the final sample, roughly equally divided over the experimental conditions ($N_{control}$=38; $N_{disadvantage}$=38; $N_{stereotype}$=42; $N_{implied\_legit}$=35).

Lexical decision task.   We included a lexical decision task (LDT) to examine how the implied legitimacy condition is interpreted. The LDT was composed of 96 trials, in which participants must decide whether a target stimulus is an existing word or not. The target categories were non-words (48 trials), filler words (24 trials), and legitimacy-related words (24 trials). All words were selected (based on pre-testing) to be of similar valence (slightly negative), and comparable length and frequency. Filler words included 'regrettable' and 'irregular', the legitimacy targets included words such as 'guilty' and 'responsible'. The non-words were created by scrambling the letters of the word stimuli. Note that, unlike the manipulation and the evaluative priming measure, this task did not include primes. The outcome of interest is the speed with which participants identify the legitimacy-related words (relative to filler words).

Preliminary analyses

For the evaluative priming measure, we used the same approach as in Study 1 for the RT cut-off criterion. We excluded any data point under 300 ms and 10% at the higher end of the scale. Applying this cut-off to the data of Study 2 yielded a distribution that was approximately normal (skewness = 0.54; kurtosis = −0.06), with a median RT of 588 ms. As before, there was a random Participant factor (Wald's Z = 8.38, p < 0.001), which is included in the multilevel models described below. We applied the same approach to the RT data in the lexical decision task – excluding any data point under 300 ms and 10% at the higher end of the scale. This meant that any reaction time below 300 ms and above 1150 ms was excluded. The resulting distribution was approximately normal (skewness = 0.72; kurtosis = 0.46), with a median RT of 667 ms.

We established that group identification could be used as a covariate, as it was not affected by the manipulation, F < 1, p = .709.

Results

Evaluative priming task

As shown in Table 4, there was a large main effect of target valence: Positive targets (M = 642 ms) elicited faster responses than negative targets (M = 668 ms). The predicted 3-way interaction between the manipulation, the subliminal group prime, and target valence also reached significance, $F(3,18183)$ = 3.93, p = .008. The interaction is represented in Figure 2. There was no further interaction with in-group identification, F < 1, ns.

The breakdown of the 3-way interaction into simple effects is shown in Table 5. As in Study 1, in the implied legitimacy condition, responses to positive targets were faster when preceded by an in-group prime (M = 634 ms), than when preceded by an out-group prime (M = 653 ms), although this effect fell just short of conventional significance (p = .064). A second simple effect appeared: In the

Table 4. Full results for the evaluative priming measure in Study 2

Fixed effect	F-value	df (denominator)	p-value
Intercept	5883.31	138	0.000
Manipulation [0 = control; 1 = stereo; 2 = disadv; 3 = implied legit]	0.16	135	0.923
Prime [0 = in-group; 1 = out-group]	1.05	18183	0.306
Target [0 = negative; 1 = positive]	61.16	18183	0.000
Prime * Target	2.60	18183	0.107
Manipulation * Prime	0.27	18183	0.847
Manipulation * Target	2.90	18183	0.033
Manipulation * Prime * Target	3.93	18183	0.008

Random effects	Wald Z	p-value
Residual	95.35	0.000
Intercept [subject = Subject]	8.19	0.000

Note. The model also included, but does not display, the term reflecting identification with the national in-group and its interactions with the other terms.
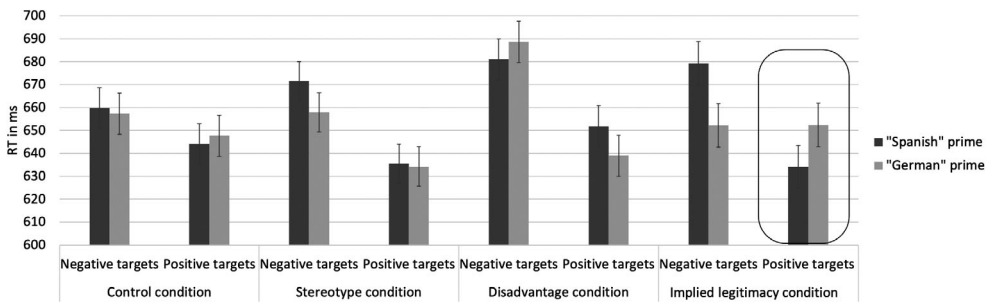

Figure 2. Reaction times in the evaluative priming measure in Study 2. Error bars represent 1 standard error.

implied legitimacy condition, responses to negative targets were *slower* when preceded by an in-group prime ($M = 679$ ms) than an out-group prime ($M = 652$ ms). That is, exposure to the implied legitimacy condition leads people to *reverse* the representations seen in the manipulation, such that (relative to out-group primes) in-group primes speed up responses to positive targets, *and* slow down responses to negative targets.

Performance and persistence
Participants correctly completed 2.60 out of 7 solvable items ($SD = 1.31$) and spent an average of 4.3 minutes on the task ($SD = 2.9$ min). The manipulation did not affect either the persistence measure, $F(3,135) = 1.05, p = .374$, nor the performance measure, $F < 1$, $p = .426$. As such, there was no support for H2.

Table 5. Simple effects in the evaluative priming measure in Study 2

| Condition | Target valence | Group prime | | M_{diff} | Std. Error | p-value | 95% CI | |
		Spanish	German				Lower	Upper
Control	Negative	659.70	657.37	2.32	9.40	0.805	−16.11	20.76
	Positive	644.06	647.76	−3.70	9.40	0.694	−22.13	14.73
Stereotype	Negative	671.52	657.96	13.56	8.98	0.131	−4.04	31.17
	Positive	635.56	634.27	1.29	8.98	0.885	−16.31	18.90
Disadvantage	Negative	681.00	688.67	−7.67	9.40	0.415	−26.09	10.75
	Positive	651.92	639.00	12.92	9.40	0.169	−5.51	31.34
Implied legitimacy	Negative	**679.24**	**652.29**	**26.95**	**9.90**	**0.007***	**7.53**	**46.36**
	Positive	634.13	652.50	−18.37	9.90	0.064*	−37.79	1.04
Across conditions	Across valences	657.10	653.70	3.41	3.33	0.307	−3.13	9.94

Significant effects are highlighted in bold. Simple effects with an asterisk are described in the text.

Lexical decision task

The LDT showed a main effect of target category, $F(1,6506) = 5.43, p = .020$, such that participants responded more slowly to legitimacy words (M = 667 ms) than to filler words (M = 659 ms). The main effect of the manipulation did not reach significance, $F < 1, p = .478$, and neither did the hypothesized interaction between the manipulation and target category, $F < 1.12, p = .338$. Inspection of the simple effects did show that those who had been exposed to the legitimising condition responded significantly slower to legitimacy-related words (M = 656 ms) than filler words (M = 643 ms), $F(1,6506) = 4.29, p = .038$. Differences in the other conditions were in the same direction (hence the non-significant effect of the manipulation), but did not reach significance, $Fs < 3.06, p > .080$.

Discussion

Here, we provide a replication of the finding from Study 1 that the implied legitimacy condition triggers responses that counteract group devaluation. Those who were exposed to the implied legitimacy condition reversed the subliminal associations they were exposed to: After exposure to negative subliminal associations with the in-group, in-group primes (vs. out-group primes) facilitated the categorization of *positive* targets, although this effect was somewhat less strong than in Study 1. Moreover, the analysis also revealed a reversal of the manipulation on *negative* targets: In-group primes (vs. out-group primes) slowed the categorization of negative targets. This response, too, can counteract the implications of the implied legitimacy condition. When the in-group is devalued relative to an out-group, this can be counteracted by boosting in-group evaluations, but also by downgrading out-group evaluations.

Like Study 1, Study 2 showed no evidence that people counteract the manipulation through their behaviour on the math task. There may be several reasons for this. First, it is possible that our sample was not large enough to detect effects on this measure. Second, it is possible that the math task could not directly resolve the threat our participants faced – in other words, the link between the manipulation and the math task may have been too tenuous.

Finally, the lexical decision task was included to examine the role of legitimacy in these findings. Results showed that participants responded more slowly to legitimacy words than to filler words – which does suggest that these targets represent a form of threat (Spears et al., 2004). However, there was no effect of the manipulation, and as such, the current results do not speak to the interpretation of the implied legitimacy condition. Study 3 aims to gain further insight into this issue, by manipulating legitimacy more directly.

STUDY 3

Study 3 used a simplified design to clarify how the implied legitimacy condition is interpreted. In the implied legitimacy condition in Studies 1 and 2, participants are exposed to subliminal associations reflecting group stereotypes, combined with subliminal associations reflecting group disadvantage. We argue that people perceive a link between these two associations and interpret this condition as legitimizing the group's disadvantaged position (Kressel & Uleman, 2015). In this way, the implied legitimacy condition taps into a particularly salient threat for our Spanish participants, who, at the time these studies were conducted, were exposed to such messages in political discourse and the media in their daily lives. In this study, we wanted to obtain evidence that perceptions of legitimacy do indeed play a role in these findings. Therefore, in Study 3 we retained the disadvantage condition and implied legitimacy condition from Studies 1 and 2, but dropped the stereotype and control conditions. We added a new condition in which legitimacy is not implied through stereotypes, but manipulated directly ('*direct legitimacy condition*'). This condition had the same structure as the implied legitimacy condition and combined two types of subliminal associations: 'Spanish' was subliminally associated with economic disadvantage *and* legitimacy targets (e.g., 'responsible'). Using this new condition, this study aims to demonstrate that our Spanish participants object to subliminal associations that legitimize their disadvantaged position, regardless of whether that argument is implied by reference to stereotypes (*implied legitimacy condition*) or made directly (*direct legitimacy condition*). We expected that people will counteract the manipulation, by making more positive associations with the in-group than the out-group, in the implied legitimacy condition (**H1**) *and* in the direct legitimacy condition (**H2**).

Method

Design & procedure
The design of Study 3 was highly similar to Studies 1 and 2. The primary difference lies in the manipulation – in Study 3, participants were assigned to one of three different conditions: the disadvantage condition and implied legitimacy condition from Studies 1 and 2, and a new condition in which legitimacy is not implied, but manipulated directly ('*direct legitimacy condition*'). As exploratory measures, we included the lexical decision task, as well as a measure of collective action ($\alpha = 0.57$), and mood. These are described in the Appendix S1. The procedure was the same as in Study 2.

Power
Given that in this study the design is adapted, this has implications for the power requirements. Using the same procedure as in Studies 1 and 2, we established that given $\alpha = 0.05$ and a power of $1\text{-}\beta = 0.80$, a sample of 111 participants is needed to detect

effects of a small size ($d \approx 0.15$). Therefore, we decided to collect a minimum of 111 participants. As before, maximum participant numbers were determined by the number of participants that could be recruited within a 2-week period. The additional participants provided a buffer in case not all participants met the inclusion criteria (i.e., Spanish nationality).

Participants

Undergraduates from the University of Granada (N = 159) participated in this study. Those who did not have the Spanish nationality (N = 7) were excluded from the sample. Five participants who had high error rates (>20%) during the manipulation were also excluded (N = 5). This left a total of 147 participants (46 men; 31%) in the final sample, equally divided over the experimental conditions ($N_{disadvantage}$=50; $N_{implied\_legit}$=48; N_{direct_legit}=49). The average age was 20 years old, ranging from 18 to 42 years old.

Manipulation

The implied legitimacy condition and the disadvantage condition were the same as in Studies 1 and 2. The 'direct legitimacy condition' was new. This condition had the same structure as the implied legitimacy condition and combined two types of associations: 'Spanish' was subliminally associated with economic disadvantage *and* legitimacy targets (i.e., 'Spanish-deserves'; 'Spanish-debt'). The out-group prime 'German' was subliminally associated with both economic advantage and non-legitimacy ('German-receives'; 'German-wealth'). In sum, all three conditions exposed participants to subliminal reminders of in-group disadvantage (Spanish-Poor), but two of the conditions additionally suggested that the in-group was responsible for this disadvantage, either by reference to stereotypes (implied legitimacy condition) or by direct reference to legitimacy (direct legitimacy condition).

Preliminary analyses

For the RT scores in the evaluative priming measure, we used the same cut-off as in Studies 1 and 2. The resulting distribution was approximately normal (skewness = 0.47; kurtosis = −0.06), with a median RT of 598 ms. As before, there was a random Subject factor (Wald's Z = 8.21, p < 0.001), which is included in the multilevel model described below. We established that group identification (α = 0.94) could be used as a covariate, as it was not affected by the manipulation, F < 1, p = .662.

Results

The model applied to the evaluative priming tasks is shown in Table 6. There was a main effect of target valence: Positive targets (M = 608 ms) elicited faster responses than negative targets (M = 618 ms). Moreover, there were main effects of the prime category and the manipulation, although the interaction between these terms did not reach significance. Based on the presence of additive main effects, we examined the hypothesized simple effects, which are shown in Table 7. The simple effects were replicated in line with hypothesis 1: After exposure to the implied legitimacy condition, the categorization of positive targets was facilitated by in-group primes (M = 607 ms) versus out-group primes (M = 615 ms). Additionally, in line with hypothesis 2, the direct

Table 6. Full results for the evaluative priming measure in Study 3

Fixed effect		*F*-value	df (denominator)	*p*-value
Intercept		25333.26	146	0.000
Manipulation [0 = disadv; 1 = direct legit; 2 = implied legit]		3.69	144	0.027
Prime [0 = in-group; 1 = out-group]		11.23	15884	0.001
Target [0 = negative; 1 = positive]		44.21	15876	0.000
Prime * Target		1.21	15876	0.271
Manipulation * Prime		0.11	15884	0.895
Manipulation * Target		1.69	15876	0.185
Manipulation * Prime * Target		0.52	15876	0.594

Random Effects	Wald Z	*p*-value
Residual	89.09	0.000
Intercept [subject = Subject]	8.06	0.000

Note. The model also included, but does not display, the term reflecting identification with the national in-group and its interactions with the other terms.

legitimacy condition showed a similar effect; the categorization of positive targets was facilitated by in-group primes (*M* = 591 ms) versus out-group primes (*M* = 600 ms). These effects arise from additive main effects, rather than a 3-way interaction (Figure 3).

Discussion

The findings of Study 3 replicated findings of Studies 1 and 2: The implied legitimacy condition triggered responses that serve to counteract group devaluation. Specifically, after exposure to a negative representation of the group, participants more readily associated positive target words with the in-group than the out-group. Further, Study 3 contributes to our understanding of how the implied legitimacy condition was interpreted. The condition where subliminal associations legitimized disadvantage through stereotypes produced similar effects as the condition in which legitimizing information was directly manipulated. Additionally, as in Studies 1 and 2, the effect was absent when no legitimizing information is given (i.e., the disadvantage condition).

Table 7. Simple effects in the evaluative priming measure in Study 3

		Group prime					95% CI	
Condition	Target valence	Spanish	German	M_{diff}	SE	*p*-value	Lower	Upper
Disadvantage	Negative	627.72	632.37	−4.65	3.67	.206	−11.87	2.56
	Positive	615.44	618.82	−3.38	3.66	.356	−10.57	3.80
Implied legitimacy	Negative	620.28	623.10	−2.82	3.73	.450	−10.14	4.50
	Positive	**606.70**	**615.04**	**−8.35**	**3.71**	**.024***	**−15.61**	**−1.08**
Direct legitimacy (new)	Negative	600.18	603.13	−2.95	3.66	.421	−10.13	4.23
	Positive	**591.45**	**599.56**	**−8.11**	**3.61**	**.025***	**−15.19**	**−1.03**
Across conditions	Across valences	**610.30**	**615.34**	**−5.05**	**1.45**	**.001*****	**−7.99**	**2.10**

Note. Significant effects are highlighted in bold. Simple effects with an asterisk are described in the text.
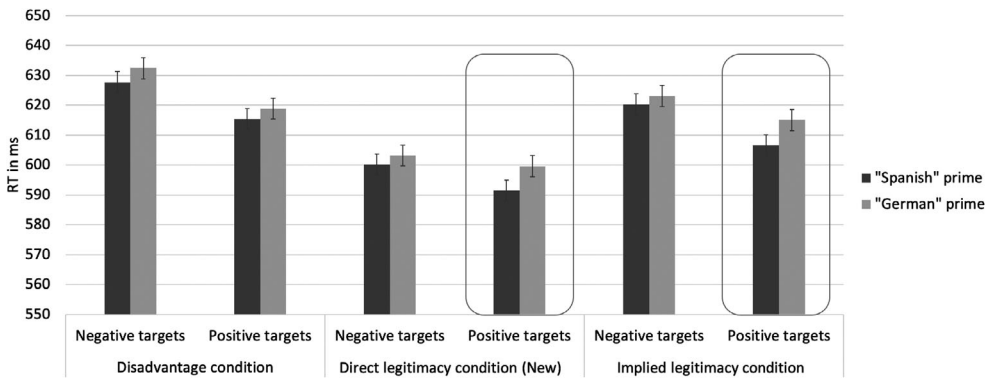
Figure 3. Reaction times in the evaluative priming measure in Study 3. Error bars represent 1 standard error.

Meta-analysis

Across studies, there was evidence that participants counteract subliminal cues of group devaluation, when those cues touch on particularly threatening issues. To provide insight into the robustness of the central effect, we meta-analysed the central effect across the 3 studies, following the procedures outlined in Goh, Hall, and Rosenthal (2016) and Morris and DeShon (2002). The effect size from each individual study (i.e., the mean difference) was weighted by sample size and combined to yield the meta-analytic effect size. Results showed that the implied legitimacy condition produced a robust effect on the evaluative priming measure, whereby in-group primes (vs out-group primes) facilitated responses to positive targets. The effect was small-to-medium in size and significant, $d = 0.34$, $Z = 3.14$, $p = .002$.

GENERAL DISCUSSION

Within the literature on group-based stigma and devaluation, it has become increasingly clear that group-based devaluation can take very subtle forms (Devine, 1989; Holoien & Shelton, 2012). The current work examines the conditions necessary to allow people to counteract subliminal cues of devaluation. We show that this need not trigger assimilation; instead, members of devalued groups have coping strategies available to address such experiences. We exposed Spanish participants to different types of subliminal associations that presented the in-group negatively. Results showed that, instead of assimilating, participants counteracted group devaluation.

With regard to the circumstances that allow these responses to arise, people counteracted subliminal cues of devaluation specifically when those cues draw on national stereotypes to legitimize the effects of the economic crisis. We argue that this represents a particularly salient threat to our Spanish participants (Bukowski et al., 2017; Fritsche et al., 2017). This is in line with previous work we have conducted in the context of gender, which showed that the tendency to counteract subliminal stereotypes of women is particularly pronounced amongst feminists (van Breen et al., 2018), who are particularly aware of the problematic implications of gender stereotypes (van Breen, Spears, Kuppens, & de Lemus, 2017). As such, it seems that exposure to subliminal cues

can produce relatively sophisticated responses, by triggering strong motivating factors like threat.

Coping responses such as these, that aim to counteract devaluation, have sometimes been termed 'resistance' (de Lemus et al., 2013; van Breen et al., 2018) a term which we have also used here. Even though the term resistance may bring to mind quite explicit and direct responses, such as collective action (e.g., van Zomeren & Iyer, 2009), we believe that subtler responses – such as those demonstrated here – should also be considered part of the resistance 'repertoire' available to disadvantaged groups. Concretely, in these studies, tendencies to counteract devaluation are expressed through the evaluative associations people made – instead of going along with the negative representation of the in-group in the manipulation, participants make *positive* in-group associations. It is worth considering whether such subtle responses can have beneficial effects, either for the individual who resists or for others. Here, implicit forms of resistance are expressed as positive attitudes towards one's in-group. This is in line with a growing body of research that has examined how resistance to devaluation may be expressed in intra-group processes (Leach & Livingstone, 2015; Scheepers, Spears, Doosje, & Manstead, 2003). For instance, devaluation might be resisted by re-emphasising one's commitment to the group's cultural practices (Droogendyk & Wright, 2017) or greater identification with the group (Branscombe, Schmitt, & Harvey, 1999). In other words, those who show implicit resistance may engage with their in-group in a more positive way. Further, subliminal responses can serve to buffer self-esteem (Rudman, Dohn, & Fairchild, 2007), and as such can benefit well-being of the individual.

Throughout this work, we argue that the reason *why* people counteract the implied legitimacy condition in particular is that it produces a sense of threat. However, in these studies we could not measure the experience of threat directly. As such, we must consider whether there are processes other than threat that could explain our findings in the implied legitimacy condition. One possibility would be that the implied legitimacy condition is *easier* to counteract than the other conditions, for instance because it is more obviously untrue. It certainly seems that national stereotypes can provide only very limited insight into macro-level economic phenomena like financial crises. Thus, participants might find the stereotype element of the implied legitimacy condition particularly easy to oppose. However, in Study 3, similar effects were obtained in the implied legitimacy *and* the direct legitimacy condition, which did not rely on stereotypes to make its legitimizing arguments. As such, we do not believe this line of reasoning can provide a straightforward explanation of our findings.

Conclusion

Given increasing evidence that group-based devaluation can take very subtle forms, we examine how members of a disadvantaged group cope with these experiences. In the context of the financial crisis in Spain, we show that members of disadvantaged groups are able to counteract subliminal cues of group devaluation. Importantly, the current findings go beyond demonstrating the occurrence of resistance, by examining the underlying concerns that trigger it: Spanish participants counteract subliminal associations that *legitimize* in-group disadvantage. In sum, these studies show that members of disadvantaged groups can draw on subtle but sophisticated strategies to address subliminal cues of group-based devaluation.

Acknowledgements

Conflict of interest

All authors declare no conflict of interest.

Author contributions

Jolien van Breen (Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Validation; Visualization; Writing – original draft; Writing – review & editing) Soledad de Lemus (Conceptualization; Funding acquisition; Methodology; Resources; Supervision; Validation; Writing – review & editing) Russell Spears (Conceptualization; Funding acquisition; Supervision; Writing – review & editing) Toon Kuppens (Conceptualization; Methodology; Resources; Supervision; Validation; Writing – review & editing).

Data availability statement

Data and Syntax associated with this project are available on the Open Science Framework, at https://osf.io/9dpk8

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Supporting Information

The following supporting information may be found in the online edition of the article:

Appendix S1. Supplementary Information.