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The reversal effect of prohibition signs

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Abstract

In public places one encounters many prohibition signs, as well as traces of the norm-violating behavior these signs are trying to reduce, like graffiti or litter. Based on goal framing theory and previous research, we argue that signs of (dis)respect of others for norms serve as norm-support cues which can weaken or strengthen the influence of norms. This norm-support mechanism implies that (traces of) norm violating behavior by others (i.e. negative norm-support cues) inhibit the influence of norms in general. We also hypothesize that making a known norm salient by means of a prohibition sign will not only focus people on this norm, but also on the corresponding (negative) norm-support cues in that particular situation, thereby enhancing the influence of these norm-support cues. Therefore, we expected that a prohibition sign placed in a setting with corresponding negative norm-support cues induces rather than reduces violations of the very same norm (i.e. same-norm reversal effect) and other norms (cross-norm reversal effect). We report results of two (quasi) field experiments that support the negative norm-support mechanism as well as the reversal effect of prohibition signs when cues show noncompliance. These findings are not only intriguing but they have important and clear practical implications.

Keywords

field experiments, norm inhibition, social norm influence

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Goal-framing theory (Lindenberg & Steg, 2007) states that the influence of norms on people's behavior is determined by the goals they pursue. Goals influence how one perceives, evaluates and behaves in a setting. The theory distinguishes three overarching goals: hedonic, gain and normative goals. People pursuing a gain goal focus on guarding and improving their resources. People pursuing a hedonic goal are less future-oriented and more focused on immediate gratification, i.e., they aim to "feel good right now". A normative goal, on the other hand, is focused on what is generally considered appropriate. Someone pursuing a normative goal is therefore sensitive to norms and information regarding norms. All three goals may be influential at a given time but the relative weight of their influence differs across situations. As goals can conflict, the weakening of one goal will make another goal (or both other goals) more

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influential. Therefore, the weakening of the normative goal makes hedonic and/or gain goals more influential, thereby inhibiting the influence of norms in general. On the other hand, strengthening the normative goal enhances the influence of norms on behavior.

The normative goal is *a priori* the weakest of the three, therefore its strength relies, more than the other goals, on external support. Consequently, cues about other people's respect or disrespect for norms and legitimate rules in general have a very strong influence on the relative strength of the normative goal. By weakening the normative goal, signs of disrespect for a norm like litter, i.e., negative norm-support cues, inhibit the influence of this norm, i.e., same-norm inhibition effect, but also of other norms, i.e., cross-norm inhibition effect (Keizer, Lindenberg, & Steg, 2008). It is the cross-norm effect that differentiates the norm-support cue mechanism from the descriptive norm influence (Cialdini, Reno, & Kallgren, 1990; Cialdini, Kallgren, & Reno, 1991; Cialdini, 2007), which states that people tend to copy the behavior of others when it is ambiguous how one should act. The proposed mechanism of norm-support cues based on goal-framing theory implies, for example, that people are not only more likely to litter in a littered setting (Cialdini et al., 1990, 1991) but also in an unlittered setting with other signs of norm-violating behavior such as graffiti.

Prohibition signs are often used to enhance norm-conforming behavior in the public realm (see Winter, Sagarin, Rhoads, Barrett, & Cialdini, 2000). They are an important tool for regulating behavior by clearly stating which rule applies in the particular situation. Prohibition signs are often placed in settings where the behavior that is supposedly prohibited frequently occurs in order to make the norm particularly salient. But is it wise to place an anti-litter sign in a littered environment? Will negative norm-support cues in the vicinity of such a sign influence its effectiveness? Might the signs surrounded by these cues even work counterproductively by increasing rather than decreasing rule-violating behavior? Based on goal-framing theory and the norm-support cue mechanism, we hypothesize that making a norm salient will not only focus people's attention on that particular norm, but also on norm-support cues in that setting, thereby making these cues more influential. We therefore expect that making a norm more salient by means of a prohibition sign in a setting with cues signaling that other people did not conform to this norm, i.e., negative norm-support cues, will not reduce but will actually increase the number of people violating that norm, i.e., same-norm reversal effect. Moreover, as the mechanism behind this effect runs through the weakening of the goal to act appropriately, we expect that the reversal effect will also increase violations of other norms in that setting, i.e., cross-norm reversal effect. Placing a prohibition sign in a setting with negative norm-support cues regarding the norm made salient will strengthen the cross-norm inhibition effect, which results in more violations of other norms.

In the present research, we study the negative norm-support mechanism in two field experiments. We first test its predicted inhibition effect on norms. Second, we test the hypothesized reversal effect of prohibition signs. Third, we answer the question, whether placing a prohibition sign will induce norm-conforming behavior in a setting where corresponding negative norm-support cues are absent. In the first field experiment, we study the same-norm inhibition and the same-norm reversal effect. We look at norm-conforming behavior under conditions where prohibition signs and norm-support cues target the (norm-conforming) behavior we observe. In the second experiment we focus on cross-norm effects. We look at norm-conforming behavior under conditions where prohibition signs and (corresponding) norm-support cues do not target the (norm-conforming) behavior we observe. The question for this second experiment was whether we indeed find similar results under these cross-norm conditions.

Method

We tested our hypotheses under the same conditions, using the same location and dependent variable to ensure that we could compare the results of the different studies. The studies all took place at the same time of day (in the afternoon) and under similar weather conditions (no rain, partly clouded). The setting in all studies was an alley in Groningen, the Netherlands, located in a large shopping area (mainly shoe stores and clothing shops) and

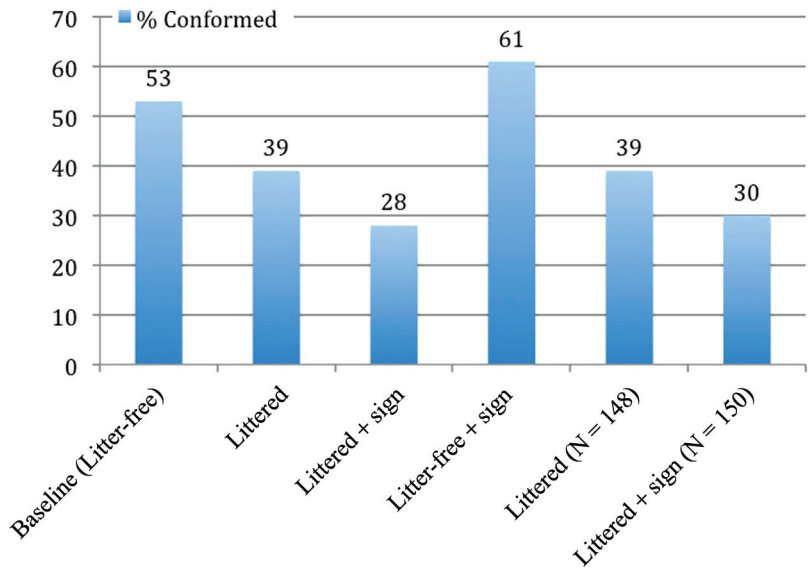

Figure 1. Percentage of people who conformed to the anti-litter norm (i.e., did not litter the flyer) in the different 'litter' conditions.

commonly used to park bicycles. We chose this shopping area rather than a location nearby, for example, an apartment building to minimize the chances that the same participants would appear in different conditions. The participants were people who came to collect their parked bicycles during the hours we ran the (quasi-)experiments, i.e., the participants were not randomly assigned to the different conditions. In their absence, we attached a flyer to the handlebar of their bicycle. The flyer was white and thus very noticeable. It read, "We wish everybody happy holidays", signed with the name of a non-existent sportswear shop. The flyer had to be removed by the subjects for them to easily use the handlebar. We wanted to find out whether or not people would conform to the anti-litter norm by not littering the flyer (our dependent variable). As there were no trashcans in the alley, "not littering" meant taking the flyer with them. We counted throwing the flyer on the ground or hanging it on another bicycle as littering.

Study 1.1 Same-norm inhibition effect

We first examined the norm-support mechanism in the absence of a prohibition sign. The goal was to test our hypothesis that negative norm-support cues for a norm indeed result in the inhibition of the influence of this norm, i.e., same-norm inhibition. To do so, we first removed all litter and other signs of norm-violating behavior (like graffiti) from the alley to create a baseline control condition (N = 77). For our experimental condition (N = 75), we littered the alley with a few empty soda cans, flyers, plastic bags and candy wrappers. Based on the hypothesized norm-support mechanism and the findings of prior research (Cialdini et al., 1990), we expected that people would be less likely to litter in our baseline "litter-free" condition than in the littered condition. We used a one-tailed test in this study and the other studies as the norm-support mechanism and the assumptions built on it are very clear about the direction of the influence. The results (see Figure 1) support this hypothesis: 53% of the people in the baseline condition conformed to the anti-litter norm compared to 39% in the experimental "littered" condition ($\chi^2(1, 152) = 3.251$, $p = .036$). Thus, people were less likely to conform to the anti-litter norm when cues of disrespect for this norm, i.e., litter, were present.

Could an anti-litter prohibition sign in the littered setting have prevented this increase in

littering? The widespread assumption is that a prohibition sign in these situations would indeed reduce norm-violating behavior. However, on the basis of goal-framing theory, we hypothesized that placing a prohibition sign will not only make the anti-litter norm more salient, but also the negative norm-support cues, i.e., litter, thereby making them more influential. Is this really the case? Will placing a prohibition sign in these situations indeed result in a same-norm reversal effect? We designed an additional experimental condition to find out.

Study 1.2 Same-norm reversal effect (1)

To test the hypothesized same-norm reversal effect, we pre-littered the alley to the same extent, using the same items, as the experimental condition of Study 1.1. However, this time we also attached an "anti-litter" prohibition sign (round red sign with white center) to the alley wall. The sign was highly noticeable and every subject entering the setting glanced at it at least. As expected, the results (Figure 1) show that the prohibition sign increased the negative influence of the litter present. When no prohibition was present, 39% of the people conformed to the anti-litter norm in a littered setting (N = 75). With the anti-litter norm made salient by the sign (N = 74), only 28% of the people conformed by not littering. Although quite substantial, the difference is marginally significant ($\chi^2(1, 149) = 1.768, p = .092$). Is the difference merely based on chance or is there a true same-norm reversal effect? Intrigued by this question and by the possible reversal effect of making a norm salient in a setting with negative norm-support cues, we decided to test the reversal effect using a larger sample to increase the power of the experiment.

Study 1.3 Same-norm reversal effect (2)

We used the same procedure and roughly the same number of participants as in Study 1.2, thereby roughly doubling the number of participant within each condition. We compared the percentage of people littering in a littered setting without a prohibition sign (N = 150) to the percentage of people littering in a littered setting with an "anti-litter" prohibition sign present (N = 150). The results (Figure 1) indeed reveal a significant reversal effect: 39% of the participants conformed to the anti-litter norm in a littered setting without a prohibition sign, while 30% did so in a similar setting with the prohibition sign ($\chi^2(1, 300) = 2.885, p = .045$). Placing a prohibition sign made people less likely to conform to the anti-litter norm in a littered setting. This reversal effect not only reveals the possible negative effect of prohibition signs, it also supports our hypothesis that a norm made salient enhances the influence of (negative) norm support cues in that setting. The question now is whether a prohibition sign only increases norm violation or whether it can increase norm compliance in a setting when there are no corresponding negative norm-support cues present. We designed a fourth condition to find out.

Study 1.4 The positive same-norm effect of prohibition sign

In Study 1.4, we conducted an additional litter-free condition with an anti-litter sign (N = 74). In this condition, 61% conformed to the anti-litter norm. In our baseline "litter-free" condition without a sign (N = 77), 53% of the people conformed to the anti-litter norm ($\chi^2(1, 151) = .881, p = .174$). The difference suggests some positive effect of the sign itself, but it is not significant. Future research is needed to examine whether this is due to a lack of power and that prohibition signs can indeed generate a positive effect when negative norm-support cues are absent.

Discussion

The results clearly show that prohibition signs indeed decrease norm-conforming behavior when negative norm-support cues are present in a setting. A comparison of the results of Studies 1.3 and 1.4 shows (see Figure 1) that in a setting with a prohibition "anti-litter" sign and no litter, 61% conformed to the anti-litter norm (Study 1.4), whereas only 30% did so in a littered setting

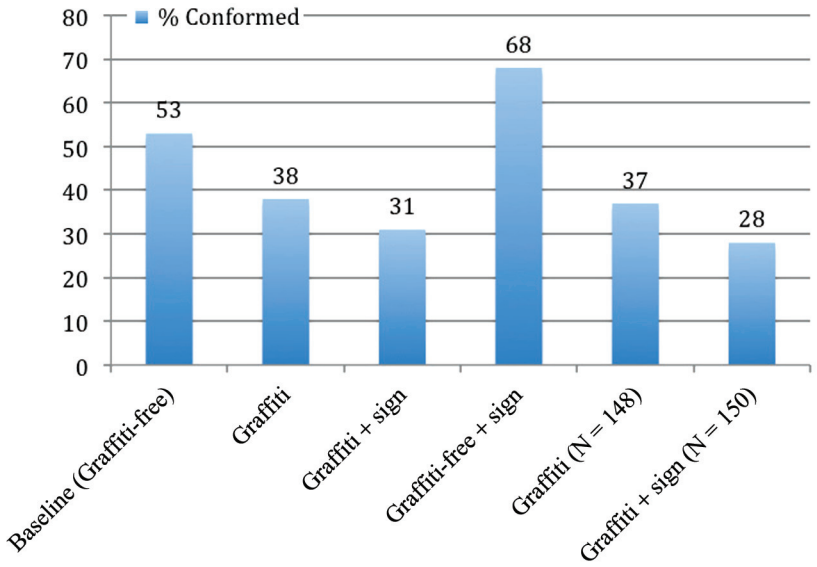

Figure 2. Percentage of people who conformed to the anti-litter norm (i.e., did not litter the flyer) in the different 'graffiti' conditions.

with a prohibition sign (see Study 1.3): $\chi^2(1, 224) = 19.572$, $p = .000$. This difference is more pronounced than the difference between the conditions without a sign, where 53% conformed to the norm when litter was absent (baseline condition) and only 39% conformed when litter was present (Study 1.3): $\chi^2(1, 227) = 3.996$, $p = .023$. These results indeed suggest that cues of disrespect for a norm (by others) become more influential when this norm is made salient by a prohibition sign.

Would we observe similar results for cross-norm effects? We proposed that the influence of negative norm support cues is based on the weakening of the goal to act appropriately. This mechanism implies that negative norm-support cues regarding a particular norm also inhibit the influence of other norms (the so-called cross-norm inhibition effect). We therefore expect that making a norm salient by means of a prohibition sign in a setting where there are negative norm support cues regarding this norm will strengthen the cross-norm inhibition effect. Is this really the case? To find out, we decided to replicate our study on littering, but this time the negative norm-support cues and prohibition sign concern the anti-graffiti norm, whereas the observed norm-violating behavior concerns littering. Our first goal (i.e., Study 2.1) was to test the cross-norm inhibition effect in a setting with no prohibition sign present.

Study 2.1 Cross-norm inhibition effect

For the experimental condition (N = 77), the alley was cleaned of litter, after which the walls were sprayed with graffiti. The graffiti was highly noticeable, and consisted out of several improvised tags in different colors. We compared the percentage of people littering in this condition to the percentage of people littering in our graffiti and litter-free baseline condition (see Study 1.1; N = 77). The results (Figure 2) indeed reveal the expected cross-norm inhibition effect: 53% conformed to the anti-litter norm in the baseline condition compared to 38% in the experimental "graffiti" condition ($\chi^2(1, 154) = .3.771$, $p = .026$). The result shows that the influence of one norm (in this case

the anti-litter norm) is inhibited by cues signaling disrespect of people for another norm (in this case the anti-litter norm). People were less likely to conform to the anti-litter norm when these negative norm-support cues were present.

We found in Studies 1.2 and 1.3 that placing a prohibition sign in a setting with corresponding negative norm-support cues did not reduce but strengthened the same-norm inhibition effect. We hypothesized that placing a sign in these situations would not only result in a same-norm reversal effect, but also in a cross-norm reversal effect. Is this really the case? In a setting with graffiti, would an anti-graffiti prohibition sign as predicted enhance the cross-norm inhibition effect on the anti-litter norm, thereby increasing littering? We designed an additional condition to find out.

Study 2.2 Cross-norm reversal effect (1)

To test the cross-norm reversal effect we attached an "anti-graffiti" prohibition sign (a round red prohibition sign with the text "Graffiti" in the white center) to the alley wall in the experimental "graffiti" condition. The sign was highly noticeable, every subject entering the setting glanced at it at least. In this experimental condition (N = 77), 31% of the participants conformed to the anti-litter norm (Figure 2) compared to 38% in a setting with graffiti and no sign (N = 77) ($\chi^2(1, 154) = 0.719$, $p = .198$). Although not significant, the direction of the difference is in line with our hypothesis. Thus, as in Study 1.3, we wanted to find out whether the results were based on lack of power or whether it takes a larger sample to show up.

Study 2.3 Cross-norm reversal effect (2)

We used the same procedure and about the same number of participants as in Study 2.2, thereby roughly doubling the number of participant within each condition. We hypothesized that making a norm more salient (by means of a prohibition sign) in a setting where there are cues signaling disrespect for this norm will enhance the cross-norm inhibition effect, leading to a reversal effect. The results (Figure 2) indeed support this cross-norm reversal effect: 37% of the participants conformed to the anti-litter norm in the condition where only graffiti was present (N = 148) compared to 28% in the condition where next to the graffiti an anti-graffiti sign was present (N = 150): $\chi^2(1, 298) = 2.848$, $p = .046$. People were less likely to conform to the anti-litter norm in the alley sprayed with graffiti if there was an anti-graffiti sign present. This finding holds a disturbing message: placing a prohibition sign in a setting with signs that people do not respect, the corresponding norm contributes to the spread of norm-violating behavior. Does a prohibition sign have any positive impact at all? Would it reduce the cross-norm inhibition effect if there were no negative norm-support cues? We conducted a final condition to address this question.

Study 2.4 The positive cross-norm effect of prohibition signs

We again removed all the graffiti and placed the anti-graffiti sign in the alley (N = 77). In this condition 68% conformed to the anti-litter norm. In our baseline "litter- and graffiti-free" condition without a sign (N = 77), 53% of the people conformed to the anti-litter norm. In contrast to the study on the same-norm effect (Study 1.4), this difference is significant ($\chi^2(1, 154) = 3.285$, $p = .035$) (Figure 2). This suggests that placing a prohibition sign in an environment in which people seem to respect the particular norm will make this respect for norms more salient and make people more likely to conform to other norms.

Discussion

The results of the second set of experiments not only support the cross-norm inhibition effect but they also clearly show that the negative effect of prohibition signs when there is clear disrespect for a norm also results in cross-norm inhibition effects. A comparison of the results of Studies 2.3 and 2.4 shows (see Figure 2) that in a setting with a prohibition "anti-graffiti" sign and no graffiti (Study 2.4), 68% conformed to the

anti-litter norm, whereas this is only 28% when graffiti was present as well (Study 2.3): $\chi^2(1, 227) = 32.775$, $p = .000$. Again, this difference is more pronounced than the difference between the graffiti and clean conditions in which we placed an anti-graffiti sign, where 53% conformed when graffiti was absent (baseline condition) and only 37% conformed when graffiti was present (Study 2.3): $\chi^2(1, 225) = 5.357$, $p = .011$. In other words, the presence of graffiti made people less likely to conform to the anti-litter norm, when an anti-graffiti prohibition sign was present in that setting. The results support the cross-norm inhibition effect, and show that cues of others' disrespect for one norm reduce the likelihood of conforming to other norms. Similar to Studies 1.3 and 1.4, we found that cues of disrespect for a norm by others become more influential and result in a stronger cross-norm inhibition effect when this norm is made salient by a prohibition sign. We also saw that when the environment indicates respect for the prohibition sign, it will increase the likelihood of conforming to other norms.

General discussion

Prohibition signs belong to the general toolkit of influencing behavior in favor of a particular norm or rule. But are these signs always effective or do they sometimes even work counterproductively? Goal-framing theory has allowed concrete expectations about the workings of these signs and our general conclusion is that indeed prohibition signs do not always work as intended and sometimes even have a reversal effect. In the present research and in earlier studies (Keizer et al., 2008), we showed that negative norm-support cues, i.e., cues signaling other people's disrespect for a norm, have a negative impact on conforming to that norm and even on conforming to other norms. Such cues seem to lower the strength of the goal to act appropriately. In this study, we could show that this effect is strengthened when prohibition signs make the corresponding norm more salient. By increasing the norm salience, prohibition signs in the public space make people more sensitive to information about norms and thus also more sensitive to the presence of negative norm-support cues. In other words, in a setting where many people do not follow the norm, it is wrong to believe that norm conformity can be increased by making this norm extra salient with a prohibition sign. What the sign does is to weaken the goal to follow norms by making the negative norm-support cues more salient.

This effect did not just hold for the norm that corresponds to the prohibition sign. As hypothesized, we showed that if people don't show respect for the prohibition sign, they will also be likely to violate a completely different norm. This "cross-norm" effect makes norm violations spread, and prohibition signs can be an important factor in reinforcing this spread.

There are signs that convey both a normative message and the message that many people do not follow the norm. For example, Schultz and Tabanico (2009) showed that some signs, such as neighborhood watch signs, not only admonish people to keep to the norms, but also convey the message that many people do violate a norm. In that particular case, the sign automatically undermines its own effectiveness even without extra negative norm-support cues.

The present research focuses on signs that make a known norm salient. However, prohibition signs are also used to inform people of what the rules in this specific situation are. Think of a "no parking" sign. We do not claim that placing such a sign will increase parking compared to the same setting without the sign, because people have not been made aware of the specific rule before the sign was placed. Before placing the sign, parked cars were just parked cars, but only after placing the sign do the parked cars become negative-norm support cues. A field experiment indeed showed that such violations of a "no parking" norm communicated via a prohibition sign indeed sparked a cross-norm inhibition effect on another norm ("no trespassing") (Keizer et al., 2008).

Our findings have important practical implications. Most importantly, prohibition signs are often used in public places in an attempt to reduce a certain norm-violating behavior in a setting where this behavior is common. The same- and

cross-norm reversal effects demonstrated in our studies reveal that this well-intended attempt not only is not effective but can actually reduce compliance and even increase deviant behavior with regard to other norms. The findings of our research boil down to two concrete pieces of advice for policy-makers: first, focus on removing signs of norm-violating behavior, especially in settings where prohibition signs are planned to be used or actually used. Second, do not place prohibition signs where the rules are not enforced.

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