The impact of being primed with social deception upon observer responses to others' pain

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Abstract

This study examined whether priming with social deception affects responses (pain estimates, self-reported sympathy, inclination to help) towards others' pain. We further explored whether the priming effect is mediated by the valence of the patients (positive/negative), as indicated by the participants. First, participants (*N*=55) took part in an 'independent' delayed memory study in which they read either a neutral text about the use of the health care system (neutral condition) or a text about its misuse (social deception condition). Second, participants watched videos of pain patients performing pain-inducing activities. Participants rated the patients' pain, the sympathy felt for the patients and the inclination to help the patients. Third, the participants re-estimated patients' pain when patients' self-report of pain was provided. Fourth, pictures of the patients were shown and participants indicated the valence of the patients (positive/negative). Results revealed no direct effect of priming with social deception. However, priming with social deception was related to less positive rating of the valence of the patients, that were related to lower ratings on pain and sympathy, and to larger discrepancies between the ratings of the patients and the observers. The results indicate that observers attribute less pain, feel less sympathy and take patients' self-reported pain intensity less into account when the patients are evaluated less positively, which is likely to occur when a cognitive scheme of social deception is primed.

1. Introduction

Pain is not only a private and subjective experience, it also has social or interpersonal features [13]. Understanding pain as an interpersonal experience requires consideration of its expressive nature and its effect upon others. Facing another in pain may elicit a variety of cognitive, emotional and behavioural responses in the observer [9-11,13,31] which may, in turn, affect the pain experience and wellbeing of the person in pain [5,10,13].

Several factors come into play when an individual faces another person in pain. One factor is the belief in the genuineness of the pain displayed by the other. It is reasonable to assume that individuals are more inclined to help sufferers when they believe the pain to be real. However, when individuals suspect (social) cheating, helping may not be guaranteed. According to Cosmides [7], individuals are particularly sensitive to cues to social cheating. Such sensitivity protects individuals from being exploited by others who challenge normal reciprocal altruism, or the social contract [17,34] by taking a benefit without earning it. Estimating another person's pain may also be conceptualized as part of a social exchange situation. When a person expresses pain, the observer who has benefits to bestow (support or practical aid) has to decide whether to do so. Probably, the greater the observer's suspiciousness about the genuineness of the pain, the more cautious she or he will become in estimating the pain.

In line with this idea, observers attribute less pain to patients [17,23] and underestimate pain to a larger degree [16] when they are explicitly told that some of the patients may fake pain. In everyday life and clinical practice, cues to cheating may be subtle and implicit rather than explicit. For example, reading an article in the newspaper about the misuse of the health care system may unobtrusively bias the reaction of an individual when she or he encounters someone experiencing pain. To date, there is no research on the effects of implicit priming with social cheating in pain.

The primary aim of the study was to investigate whether the effect of implicit priming with social deception lowers the observers' estimates of pain experienced by a patient, the sympathy for the patient and the inclination to help. A secondary aim was to investigate whether priming with social deception influenced the degree to which the self-report of the patient is taken into account. According to Kappesser and colleagues [16] the verbal report of the patient is an important cue for observers when estimating pain.

Finally, we focused upon one potential mediator of the priming effect upon the observer responses. In line with previous research that suggests that the valence of the patient (more specifically, how positive or negative a patient is evaluated by the observer) plays an important role in pain estimations by observers [2,8,29,30], we investigated whether the valence of the patients mediates the effect of priming with social deception on the observer responses (pain, sympathy, inclination to help, and consideration of patients' pain report).

2. Method

2.1. Participants

Participants were recruited from October 2010 until January 2011 by means of an advertisement in local newspapers (N=41) or they were approached and asked to volunteer in two local supermarkets (N=16, volunteer rate = 36%). In total, 57 individuals (16 men, 41 women) volunteered to participate in the study. To be eligible, participants had to be 18 years or older and had to speak Dutch fluently. Potential participants who indicated that they knew one of the patients shown on the videos were excluded (N=1). Further, participants were also excluded when they knew the true purpose of the study at the end of the experiment (N=1). The final sample (N=55) consisted of 28 participants in the social deception condition (10 men; M_{age} = 34.04 years; SD = 11.92; range = 19-66) and 27 participants in the neutral condition (5 men; M_{age} = 33.10 years; SD = 13.65; range = 18-70). We aimed at collecting at least 20 observations per cell/condition [27]. About half of the participants were married, in a

relationship or cohabiting (54.5%) and about half of the participants had a higher education (beyond the age of 18 years) (47.3%). Most of the participants were employed (58.2%) and a quarter of the participants (23.6%) were university or college students. The unemployment rate was 12.7% and 5.5% of the participants were retired. All participants were Caucasian. The study was approved by the ethical committee of the Faculty of Psychology and Educational Sciences of Ghent University.

2.2. Apparatus and stimuli

2.2.1. Apparatus

The experiment was programmed and presented by the Inquisit Millisecond software package [15] on a 745 Dell Optiplex computer with a 75 Hz, 19 inch color CRT monitor.

2.2.2. Texts about the (mis)use of the health care system

Two different texts about the health care system were used. The text used in the neutral condition was a text describing the Belgian health care system and how people make use of it. The text used in the social deception condition focused on the misuse of the health care system by describing how some people take advantage of it and what consequences this has for the whole population including the participant (see Appendix A for the English version of the texts).

2.2.3. Videos and pictures

Videos and pictures of four different chronic back pain patients (two men, aged 55 and 54 years and two women, aged 44 and 53 years) selected from a larger set of pain videos were used for this study. This set of pain videos display the performance of four potentially painful movements by back pain patients who were in (outpatient) treatment for the pain at the University Hospital in Ghent. The patients were asked to execute four movements: 1) lying down on a bed and standing up, 2) sitting down on a chair and standing up, 3) taking a box from the ground, putting it on a table and replacing it on the ground, and 4) picking up

marbles from the ground. Every patient started the movement in upright position with the face directed to the camera. The four patients we selected had been suffering from low back pain for at least 5 years. The self-reported mean pain intensity during the past 6 months was 7 (two patients), 6 (one patient) or 8 (1 patient) on a scale from 0 (no pain) to 10 (pain as bad as could be). The four movements were videotaped for all 4 patients, resulting in 16 different videos that displayed patients' full body pain behaviors. Patients provided verbal pain ratings on a numerical scale (0: no pain at all – 10: pain as bad as could be) after the performance of each movement. Unfortunately, the verbal pain ratings were unavailable for two movements of one patient. This patient prematurely halted the movement on these occasions, and no pain reports were obtained for those situations. For the present study, videos of two patients (one male and one female patient) displaying a high level of pain behavior and two patients (one male and one female patient) displaying a low level of pain behavior were selected based upon face validity. Before the actual experiment, we validated our categorization of patients as displaying either a high level or a low level of pain behavior in an independent sample of 24 lay people (8 men and 16 women; M_{age} = 31.30, SD_{age} =11.81, range = 17-58 years). These lay persons were recruited from the immediate environment of the researchers. They watched each video fragment and rated each time the pain that they believed to be experienced by the patients using a numerical rating scale (0 = no pain at all; 10 = pain as bad as could be). The lay persons were requested to judge the pain based upon the behavior displayed on the video. No information was provided regarding the actual self-reports of pain of the patients. Analyses indicated that the judges rated the pain of two patients (one male, ZA, and one female, PV) as low (M_{male} = 2.08, SD_{male} = 1.48; M_{female} = 2.93, SD_{female} = 1.73) and the pain of two patients (one male, SP, and one female, ZN) as high (M_{male} = 6.29, SD_{male} = 1.88; M_{female} = 6.89, SD_{female} = 2.29). Based upon these results, we categorized patient ZA and patient PV as

displaying a low level of pain behavior, and patient SP and patient ZN as displaying a high level of pain behavior.

The mean length of the 16 video fragments used in this study was 18.56 seconds (*SD* = 10.50). We also provided some sociodemographic information about the patients using a vignette methodology. This information was not part of the experimental manipulation, but was introduced to make the pictures and videos of the patients more vivid or realistic. Vignettes included for each patient the (fictitious) first name (Sam, Jo, Kim, Dominik), age (49, 48, 46, 45), current job (surveyor, teacher, public employee, bank employee) and number of children (4, 2, 1, 3). This background information was counterbalanced across the four different patients.

2.3. Measures

A numerical rating scale (0-10) was used to asses observers' estimated pain of the patient, inclination to help the patient with daily activities and sympathy for the patient (0 indicated 'no pain at all', 'totally unwilling', and 'no sympathy at all' respectively; 10 indicated 'pain as bad as could be', 'totally willing', and 'a lot of sympathy' respectively). Participants were requested to evaluate the patients in terms of valence using a 21-point scale (-10 = very negative, 0 = neutral, 10 = very positive). Rating scales ranging from negative to positive have been applied by several researchers to measure participants' valence towards events or stimuli [e.g. 18,28].

2.4. Procedure

2.4.1. Priming procedure

In the experiment room, the participant was welcomed by the two experimenters. Experimenter 1 was involved in the 'independent' delayed memory task. The other experimenter invited the participant to participate in a second, independent study. Experimenter 1 informed the participant that he/she would be asked to read a text very

carefully and that questions would be asked (1) immediately after reading the text and (2) after the participation in experiment 2. Written informed consent was obtained. Participants randomly received the neutral text about the health care system (i.e., neutral condition) *or* the text about the misuse of the health care system (i.e., social deception condition). Randomization was done by means of a computerized random number generator. After reading the text, the participant reported during one minute what he/she remembered about the text. Then, experimenter 1 left the room, the participant read the text a second time and experimenter 2 (who was blind with regard to the condition the participant was assigned to) started the 'actual' experiment. In particular, the participant was told that the study examined people's impression formation of others in pain and that questions about this impression formation would be asked at the end of the experiment. Participants were told that verbal information about four different persons would be given, and that video fragments of these persons would be presented on the computer screen.

2.4.2. Pain rating phase

When the participant pressed ENTER on the PC keyboard, a first neutral picture of a patient combined with one of the four vignettes was shown. When the participant pressed ENTER again, the video fragment of the same patient performing a painful movement was presented. This procedure was repeated with the video fragments of the three other patients. To have reliable measures, each patient in combination with the same vignette was shown four times as there were four different videos per patient. In sum, 16 different videos were randomly presented. After the presentation of each video, a black screen appeared and participants were requested to provide written ratings of the patients' pain, their sympathy felt for the patient and their inclination to help the patient.

2.4.3. Pain rating after feedback phase

Participants were presented one video of each patient. In sum, four different videos were presented in this phase. Per participant, all four patients were performing the same movement in this phase and this was counterbalanced between participants. Participants were provided with the self-reported pain intensity ratings of the patients (NRS; 0-10) and were, once again, asked to estimate the patients' pain. Because one patient did not report her/his pain after the performance of two movements, participants were provided with the self-reported pain rating of another movement of the same patient. However, these data were considered as missing values in the data analyses. The self-reported pain, averaged across the four different movements were 7/10 (man displaying a low level of pain behavior) and 4.25/10 (woman displaying a low level of pain behavior), 3/10 (man displaying a high level of pain behavior) and 8,75/10 (woman displaying a high level of pain behavior).

2.4.4. Valence rating phase

A picture of each patient was shown to the participant who rated the overall valence of the patient, i.e. the participant rated how positively/negatively she or he evaluated the patient. At the end of the experiment, the participant was requested to fill out a second informed consent after revealing the true purpose of the study. Total duration of study participation (i.e., memory task and rating task) was on average 40 minutes per participant.

2.5. Statistical analyses

2.5.1. Analyses of variance

The outcome variables were participants' ratings of 1) patients' experienced pain (= 'pain'), sympathy for the patients (= 'sympathy'), and inclination to help the patients with daily activities (= 'help'), 2) the absolute difference in pain ratings between patients and participants when the self-reported pain ratings of the patients were provided (see 'pain rating after feedback phase') (= 'discrepancy'), and 3) participants' ratings of the valence of the patients (positive/negative; 'patient valence'). Pain, sympathy and help (see 'pain rating

phase') were the mean scores per patient of the ratings on the 16 trials presented to the participants. Discrepancy (see 'pain rating after feedback phase') was the mean score of the absolute difference scores between the pain ratings of the patients and those of the participants on the 4 trials presented to the participants. Patient valence (see 'valence rating phase') was the mean score per patient of the ratings on the 4 trials presented to the participants. To investigate the influence of condition upon pain, sympathy and help, a multivariate ANOVA was performed with condition as a between-subject variable and pain, sympathy and help as dependent variables. To investigate the influence of condition upon discrepancy and upon patient valence, two univariate ANOVA's were performed with condition as fixed factor and discrepancy and patient valence as dependent variables respectively. Effect sizes were measured by means of Cohen's *d* [4] (.20 = small effect, .50 = medium effect and .80 = large effect).

2.5.2. Regression analyses

The influence of patient valence upon pain, sympathy, help and discrepancy was investigated by means of four regression analyses with patient valence as the independent variable and pain, sympathy, help and discrepancy as the dependent variables.

2.5.3. Mediation analyses

To test the mediating role of patient valence, we used a bootstrapping method following the procedure described by Preacher and Hayes [14,24]. The bootstrapping method is a nonparametric resampling procedure that has been shown to be more appropriate than a normal-theory test (i.e., Sobel's test) for studies with smaller sample sizes [19,24,26]. Figure 1 represents the effects and their corresponding weights that must be distinguished in order to perform the mediation analysis (for reasons of clarity, only the outcome 'pain' is mentioned in the figure, however, the figure is applicable for the other three outcomes, sympathy, help and discrepancy as well). The direct effect of condition on pain has the weight *c*', whereas the

indirect effect, through the proposed mediator 'patient valence' has the weight *ab*. The effect of condition on patient valence is represented by weight *a*, whereas weight *b* is the effect of patient valence on pain, partialling out the effect of condition [25]. The total effect (*c*) of condition upon pain consists of both the direct (*c*') and the indirect (*ab*) effect. In the bootstrap analyses, the indirect effect (*ab*) is found to be significant if the bootstrap confidence interval excludes zero. Overall, mediation is assumed if 1) the total effect *c* is significant in addition to the indirect effect *ab* and 2) the total effect *c* reduces significantly when controlling for the indirect effect *ab*. However, if the total effect *c* is not significant, but the indirect effect *ab* is significant, the effect is considered an indirect effect and not a mediation [21].

– INSERT FIGURE 1 ABOUT HERE –

3. Results

3.1. Descriptives

Means and standard deviations of the ratings on pain, sympathy and inclination to help as well as of the discrepancy (pain ratings of the patient minus the pain rating of the participant) and the patient valence per condition are presented in Table 1. All data were normally distributed (*KS Z*-score (55) = 0.83, *ns),* no outliers (defined as scores that deviate more than 3 SD's from the mean) were identified. Data of one participant were excluded from the analyses with regard to inclination to help, as data on inclination to help were missing for one participant.

– INSERT TABLE 1 ABOUT HERE –

3.2. Analyses

3.2.1. Analyses of variance

Multivariate ANOVA revealed no effect of condition [1] upon pain, sympathy and inclination to help ($F(3,50) = 0.082$, *ns*). Univariate ANOVA revealed no effect of condition upon the pain discrepancy measure ($F(1,53) = 0.65$, *ns*). However, an effect of condition upon patient valence was found ($F(1,53) = 4.99$, $p < .05$; $d = 0.60$; 95% CI = .06:1.14), indicating that valence of the patients was rated as less positively in the social deception condition than in the neutral condition ($M_{\text{social deception}} = 21.03$; $M_{\text{neutral}} = 33.58$).

3.2.2. Regression analyses

Regression analyses revealed that less positive ratings of valence were related to lower pain ratings ($t(53) = 2.87$, $p < .01$; $\beta = .37$) and less sympathy ($t(53) = 2.66$, $p < .05$; $\beta = .34$); however, no effect of valence upon inclination to help ($t(52) = 1.45$, *ns*) was found. Next, the results revealed an effect of patient valence upon the pain discrepancy measure ($t(53) = -2.35$, $p < .05$; $\beta = -.31$), indicating a larger discrepancy between patient and participant with less positive ratings of the valence of the patients[2].

3.2.3. Mediation analyses

Bootstrap analyses (with 5000 resamples) for patient valence as a mediator in the relation between condition and pain did not reveal a total effect of condition upon pain ($c = -0.09$, $SE = 0.34$, *ns)*, nor a direct effect of condition upon pain ($c' = 0.19$, $SE = 0.33$, *ns*). However, a direct effect of condition upon patient valence ($a = -12.56$, $SE = 5.62$, $p < .05$) was found, indicating less positive ratings of valence in the social deception condition compared to the neutral condition. Also a direct effect of patient valence upon pain ratings ($b = 0.02$, $SE = 0.01$, $p < .01$) was found, showing less attributed pain with less positive ratings of the valence of the patients. Further, the indirect effect of condition on pain through patient valence (ab = -

[1] All participants in the social deception condition remembered that the text was about social deception. When participants were asked about the content of the text, all participants from the social deception condition mentioned words that are related to social cheating (e.g., misuse and fraud). None of the participants in the neutral condition mentioned words that are related to social deception.

[2] The results remained similar after controlling for the level of pain behavior displayed by the patients (a low level of pain behavior versus a high level of pain behavior).

0.28, *SE* = 0.17) was significant as the bootstrapped confidence interval (90% CI: -0.75:-0.04) excluded zero. The same pattern of results was reflected with regard to sympathy and discrepancy: there was no total effect, nor a direct effect of condition upon sympathy (*c* = -0.12, *SE* = 0.42, *ns; c'* = 0.20, *SE* = 0.41, *ns*) or discrepancy (*c* = 0.21, *SE* = 0.33; *ns; c'* = -0.01, *SE* = 0.34, *ns*); however, there was a direct effect of patient valence upon sympathy (*b* = 0.03, *SE* = 0.01, $p < .01$) and discrepancy (*b* = -0.02, *SE* = 0.01, $p < .05$), indicating lower ratings on felt sympathy, as well as larger discrepancy between patient and participant with less positive ratings of the valence of the patients. Finally, the indirect effect of condition, through patient valence, was significant for both sympathy (*ab* = -0.32, *SE* = .18; 90% CI: -0.84:-0.06) and discrepancy (*ab* = 0.22, *SE* = 0.15; 90% CI: 0.02:0.60). Further, the bootstrap analyses did not reveal a total effect, nor a direct effect of condition upon help (*c* = -0.19, *SE* = 0.43, *ns; c'* = -0.01, *SE* = 0.45, *ns*) and no direct effect of valence upon help (*b* = 0.02, *SE* = 0.01, *ns*) was found. The indirect effect of condition, through patient valence, upon inclination to help was not significant (*ab* = -0.18, *SE* = 0.17; 90% CI: -0.66:0.03). These results indicate that priming with social deception negatively influences the pain estimates as well as felt sympathy and discrepancy indirectly via the valence of the patient.

4. Discussion

The present study investigated the influence of priming participants with social deception upon participants' ratings of the patients' pain, sympathy and inclination to help the patients. Furthermore, we investigated the influence of priming participants with social deception upon the degree to which participants took the self-reported pain ratings of the patients into account. Finally, this study investigated whether the effect of priming with social deception could be explained by the valence of the patient as indicated by the participants. Half of the participants were primed with a text about the misuse of our health care system (i.e., social deception condition) and half of the participants were primed with a neutral text about the use

of our health care system (i.e., neutral condition). Findings indicated that priming with social deception had no overall effect upon the ratings of pain, sympathy and inclination to help, neither upon the discrepancy in pain ratings between patient and participant. However, priming with social deception was associated with less positive ratings of the valence of the patients, which in turn contributed to lower ratings of pain, to lower ratings of sympathy and to a larger discrepancy between patients' pain ratings and those of the participant.

Contrary to previous findings of Kappesser and Williams [17] and Poole and Craig [23] who found a direct effect of priming on lower pain estimations, our findings indicate that this effect occurs indirectly, i.e., via observers' evaluation of the valence of the patient. It is not surprising that observers' evaluation of the valence of the patient is an important predictor. First, valence is, next to arousal and dominance one important dimension on which stimuli are rated by individuals (see Osgood and colleagues, as cited in Bradley and Lang [1]). Second, considerable research has shown that the valence of the patient plays a significant role into pain estimation. For example, Chibnall and Tait [2] and Tait and Chibnall [29,30] found that less likable patients are attributed lower pain scores, lower distress and lower disability scores. Also, De Ruddere and colleagues [8] found that observers attribute lower pain scores to patients expressing high pain when they dislike rather than like them. Moreover, our results indicate that observers' evaluation of the patients' valence not only influences observers' cognitive responses (i.e., pain estimation), but also observers' emotional responses (i.e., sympathy felt for the sufferer), as well as the willingness to take the self-reported pain of the patient into consideration.

There are several possible explanations for why patients were evaluated less positively when observers were primed with social deception. A first explanation may relate to the 'cheating detection mechanism' [7,17,34]. Participants who have read the text about social deception, might have been alerted to social deception of the patients, making them more

prone to evaluate the patients less positively. It is reasonable to assume that observers' belief in cheating behavior of others co-occurs with viewing the other as less positively. A second, related mechanism stems from social psychology. Reading the text about misuse may have prompted participants to perceive the patients as part of their 'social out-group'. Following Turner and colleagues [33] individuals favor others with whom they can identify (the 'social in-group') and reject others with whom they cannot identify (the 'social out-group'). Evaluating the valence of the patients as less positively may be part of considering these patients as being part of the 'social out-group'. Finally, a third potential mechanism is assimilation to the context in which the participants evaluated the valence of the patients. According to Tesser and Martin [32], contextual elements have the most important influence upon evaluations, especially when people are instructed to make an evaluation of a stimulus or target. Individuals tend then to assimilate their evaluation to the valence of the context in which the target is presented, when, at least, this context is relevant and accessible for the individual [32]. In our study, evaluating the patient less positively may be explained by the assimilation to the negative context in which the target was presented (i.e., social deception).

Although the effect of priming upon the valence of the patients is clear, one puzzling question remains. Why did we not observe a direct effect of the priming upon participant's ratings of pain and sympathy? Previous research has indicated that when the cheating detection mechanism is activated, people attribute less pain to patients [16,17,23]. Further, research revealed that observers feel less empathy and less altruistic motivation for members of one's social out-group [12,22]. As yet, we have no full explanation. One reason may be that the priming had only a small effect on observers' evaluation of the valence of the patient, leaving insufficient power to detect other changes. Another explanation may be that also other variables, which we did not take into account, had an impact upon the effect of priming on the ratings. As our priming manipulation occurred on an more implicit level than previous studies

in the context of pain [16,17,23], we may assume that the participants in the present study were less certain about the faking behavior of the patients, leaving room for different factors to influence the pain estimations. Indeed, according to Tait and colleagues [31], observers who feel *uncertain* about their pain judgments, are more prone to contextual information. For example, participants in the social deception condition might have felt compassion towards patients who are the victims of the misuse by others. Concurrent feelings of compassion might have suppressed the punishing behavior (i.e., attributing lower pain, feeling less sympathy and taking the self-reported pain less into account) towards the 'cheating' patients in our study. Accordingly, Condon and DeSteno [6] indicate that when compassion is induced in participants, the likelihood that those participants will punish a 'cheater' is reduced.

Our findings may have some clinical implications. First, the results of the present study are in support of previous research demonstrating the crucial role of observers' evaluation in terms of valence of the patient in observer responses towards (the person in) pain [2,8,29,30]. Taking the pain of less positively evaluated patients less seriously may have detrimental consequences for the patient as lower pain estimates may lead to inadequate pain management, and less sympathy to less actual helping behavior. Second, taking the patient's pain report less into consideration may make pain sufferers feel disbelieved and misunderstood. All this may impact treatment outcome.

This study has some limitation and indicate some important suggestions for future research. First, we used an experimental procedure to prime participants with social deception. It may well be that in everyday situations, individuals are primed with social cheating in other ways (e.g., hearing that someone got a sick note, but does not seem to be sick at all; hearing colleagues reporting incidences of social deception). It is yet unknown which situations give rise to a priming with social deception. Further research may identify these triggers in natural situations. Second, although the current study indicated one particular

factor affecting observers' evaluation of the valence of the patient, i.e., an (implicit) priming of the observers with social deception, research about other factors that may prime observers with social deception and induce less positive evaluations is needed. For example, it would be interesting to examine whether the absence of medical evidence for the pain may function as a prime towards social cheating and whether the relation between the absence of medical evidence for the pain and lower ratings of pain [2,3,29,30] is mediated by observers' evaluation of the valence of the patient. Another example that may function as a cue for social cheating has been suggested by MacLeod and colleagues [20], who found that observers judge adaptive copers who claim compensation as less deserving compensation than patients with maladaptive coping styles. Third, behavioural measures (e.g., approach-avoidance behaviour measures) may complement our self-report measures and strengthen the validity of our results. Self-reports may be prone to social desirability. Fourth, participants were recruited from the community and our results may not generalize towards professional caregivers. Future research may examine the effect of implicit priming in professional caregivers. Although Kappesser and colleagues [16] found an effect of the explicit activation of the cheating detection mechanism in professional caregivers, we do not know whether such effect will be found with regard to a more implicit manipulation. Fifth, videos of four actual patients with chronic low back pain were used for this study. An incongruence was found between the self reports and the displayed pain behavior of two of these patients. Future research may focus upon different patients/patient groups in order to investigate the generalizability of the results.

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Table 1. Means (and standard deviations) for pain, help, sympathy, discrepancy and (patient) valence per condition

	pain	help	sympathy	discrepancy	Valence*
control condition	4.37 (1.21)	4,09 (1.66)	4.91 (1.56)	1.28 (1.39)	33.58 (21.92)
social deception condition	4.49 (1.32)	4.19 (1.51)	5.18 (1.51)	1.51 (1.63)	21.03 (19.74)

*$p < .05$

Figure Captions

Fig. 1. The effects and their corresponding weights in the mediation model.

Note$_1$. The total effect (c) consists of both the direct effect (c') and the indirect effect (ab). *Note*$_2$. The figure is applicable for the outcomes sympathy, help and discrepancy in pain ratings as well.