Psychological Research (2017) 81:939–946
DOI 10.1007/s00426-016-0798-6

ORIGINAL ARTICLE

Smooth criminal: convicted rule-breakers show reduced cognitive conflict during deliberate rule violations

Aiste Jusyte[1,2] · Roland Pfister[3] · Sarah V. Mayer[2] · Katharina A. Schwarz[3,4] · Robert Wirth[3] · Wilfried Kunde[3] · Michael Schönenberg[2]

Received: 16 December 2015 / Accepted: 11 August 2016 / Published online: 27 August 2016
© Springer-Verlag Berlin Heidelberg 2016

Abstract Classic findings on conformity and obedience document a strong and automatic drive of human agents to follow any type of rule or social norm. At the same time, most individuals tend to violate rules on occasion, and such deliberate rule violations have recently been shown to yield cognitive conflict for the rule-breaker. These findings indicate persistent difficulty to suppress the rule representation, even though rule violations were studied in a controlled experimental setting with neither gains nor possible sanctions for violators. In the current study, we validate these findings by showing that convicted criminals, i.e., individuals with a history of habitual and severe forms of rule violations, can free themselves from such cognitive conflict in a similarly controlled laboratory task. These findings support an emerging view that aims at understanding rule violations from the perspective of the violating agent rather than from the perspective of outside observer.

A. Jusyte and R. Pfister contributed equally.

✉ Roland Pfister
roland.pfister@psychologie.uni-wuerzburg.de

1 LEAD Graduate School and Research Network, University of Tübingen, Tübingen, Germany

2 Department of Clinical Psychology and Psychotherapy, University of Tübingen, Tübingen, Germany

3 Institute of Psychology III, University of Würzburg, Röntgenring 11, 97070 Würzburg, Germany

4 Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Introduction

Rules and social norms are the pillars of society. Although they may feel forced upon us at times, an almost automatic tendency to adhere to group norms not only belongs to the nature of human beings, but also seems to be an inherent and adaptive part of the behavioral repertoire found in many other social animals (de Waal, 2013; de Waal & Ferrari, 2010; van de Waal, Borgeaud & Whiten, 2013). This assumption is supported by converging findings that suggest a sense of social equity and morality to be deeply rooted in the mammalian brain (de Waal & Ferrari, 2010; Fehr & Rockenbach, 2004). For human agents, the drive to follow an established group norm or to comply with an authority can even be so strong as to override objective reality (Asch, 1956; Berns et al., 2005) or an individual's moral principles (Milgram, 1963, 1974). In other words, rules seem to be followed almost blindly, and conformity is sometimes even favored over logical and rational response options.

Even though humans may be wired to follow rules by default, everyday experience still suggests rule violation to be a rather common phenomenon. Violations, such as occasionally running a stop sign, indeed appear quite regularly, and previous research has made strong progress with uncovering situational and personal predictors that render rule violations more or less likely to occur (Dommes, Granié, Cloutier, Coquelet & Huguenin-Richard, 2015; Fehr & Fischbacher, 2004; Kilduff, Galinksy, Gallo & Reade, 2015; Kimbrough & Vostroknutov, 2016; Reason, 1995; Yap, Wazlawek, Lucas, Cuddy & Carney 2013).

What these studies do not address, however, is how rule violations differ from rule-based responding for the individual agent who commits a rule violation (Moore & Gino, 2015; Pfister, 2013). That is: What are the cognitive mechanisms that guide deliberate rule violations at the very moment of their commission? In an attempt to approach this question, we previously used a controlled laboratory setting in which participants either followed or violated a simple stimulus–response mapping rule (Pfister, Wirth, Schwarz, Steinhauser & Kunde, 2016; Wirth, Pfister, Foerster, Huestegge & Kunde, 2016b). The rule in question required movements from a start location to one of two target locations on opposite sides of the screen. Crucially, participants were prompted in some trials to violate the standard rule by moving to the target position on the opposite side of the screen (i.e., akin to the definition of "necessary violations"; Reason, 1990, 1995).

This controlled setup was created to isolate the cognitive mechanisms underlying rule-breaking from other influences such as reward expectancies and possible sanctions or punishment that may often accompany rule-breaking in everyday live. Importantly, rule violations only differed from rule-based behavior in that they were labeled as violations. Even for these arbitrary response-mapping rules, analyses of the participants' movement trajectories documented a continued impact of the rule representation during rule violations, as the corresponding movements were attracted to the rule-based response option (Pfister et al., 2016; Wirth et al., 2016b).

Thus, previous results suggest that even simple, arbitrary rules are not broken easily, and rule violations seem to entail a perpetual conflict between the agent's intentions and the rule in question. Here, we sought to validate the employed experimental paradigm against an external criterion by investigating individuals with a stable history of severe rule-breaking behavior. We hypothesized that a population with convictions for crimes related to rule-breaking would not show a perpetual influence of the original rule during rule violation in this laboratory task—or at least less so than the average individual. Two arguments support this hypothesis. First, agents with low cognitive conflict during rule violations should be more likely to commit rule violations following theories on effort discounting (e.g., Kool, McGuire, Rosen & Botvinick, 2010). Second, even for agents with similar cognitive conflict during rule violation, more experience with overcoming cognitive conflict is expected to decrease precisely this conflict (e.g., Vu, 2007; Vu, Proctor & Urcuioli, 2003). Thus, both a predisposition for rule-breaking and a continued experience with this behavior should lead to diminished cognitive conflict during rule violation.

This argument presumes that habitual rule-breaking, in fact, is a personal trait that is stable over time. This presumption is supported by extensive research in clinical and developmental psychology demonstrating high maintenance rates of antisocial behaviors throughout the developmental course, with evidence pointing toward particularly high chronicity when conduct problems appear at early age (Moffitt, 1993, 2003; Sampson & Laub, 1992). This early-onset subgroup is particularly resistant to treatment and tends to maintain conduct problems into adulthood, resulting in severe psychopathologies such as antisocial personality disorder and psychopathy as well as substance abuse and delinquency (Disney, Elkins, McGue & Iacono, 1999; Frick & Dickens, 2006; Frick & Loney, 1999; Moffitt, Caspi, Harrington & Milne, 2002). Converging findings from a related field, namely deception research, have also reported "prolific liars" to be a rather stable subgroup of individuals who are both, prone to lie and efficient in doing so (Serota & Levine, 2015). Thus, prior research indicates that behaviors related to rule-breaking are stable over time in some subpopulations that are more prone to rule-breaking regarding both, the frequency as well as the quality of these behaviors.

In the present study, we assessed cognitive conflict during rule-compliant and rule-violating actions in a population of incarcerated criminals convicted for precisely the behavior in question (i.e., persistent and severe rule-breaking) and compared their performance to a sample of matched controls without criminal record. Based on previous methods (Pfister et al., 2016; Wirth et al., 2016b), our task involved a stimulus–response mapping rule that the participants were instructed to either follow or to violate a rule that specified a mouse movement to either a left or a right target area. For the control group without criminal history, we expected violation responses to yield a considerable deviation in movement trajectories relative to rule-based responses. For the group of convicted criminals, by contrast, we expected a smaller and possibly even absent effect of rule violation on movement trajectories.

Materials and methods

Participants

The sample of incarcerated male criminals was recruited from two German correctional facilities (*Justizvollzugsanstalt München*; *Justizvollzugsanstalt Heimsheim*) through notification by psychological services within the facility. The notification specified that we sought participants who were convicted for theft, fraud, swindle or forgery. Based on the effects observed in previous experiments using the employed task (Pfister et al., 2016; Wirth et al., 2016b), the sample size of the group of convicted criminals was determined to include at least 20 usable data sets (and a corresponding number of data sets in the control group). Interested individuals were subsequently contacted by the facility's psychological service workers who arranged the assessments with individuals who did not meet the exclusion criteria. Exclusion criteria were drug-related and violent crimes, as well as insufficient knowledge of the German language. All assessments were conducted by trained psychologists from our research group in designated rooms within the correctional facility. Control participants with no criminal history, no current psychiatric morbidity or a history thereof were recruited via announcements in vocational schools as well as the university's subject databases in order to match for educational status and age. The assessments for the control group were carried out in designated rooms of the schools or the university by members of our research group. Exclusion criteria for the control participants were as follows: self-reported current psychiatric morbidity or a history thereof, as well as a history of criminal or antisocial behavior. A total of 50 participants were recruited and tested, 26 for the group of convicted criminals and 24 for the control group. Five participants of the group of convicted criminals were excluded from further analysis due to non-compliance with the task; the final sample of convicted criminals thus comprised 21 individuals. One participant was excluded from the control group due to a self-reported history of habitual antisocial behaviors, resulting in a final sample of 23 control participants.

The average length of sentence was 45.40 months (SD = 39.58) with the majority of the sample being convicted for two or more crimes ($n = 16$; 76.20 %). The types of crimes committed were as follows: fraud ($n = 19$; 90.48 %), theft ($n = 5$; 23.81 %), forgery ($n = 6$; 28.57 %), embezzlement ($n = 5$; 23.81 %), tax evasion ($n = 2$; 9.52 %), formation of a criminal enterprise ($n = 2$; 9.52 %), CPU fraud ($n = 2$; 9.52 %), theft of services ($n = 1$; 4.76 %), driving without a license ($n = 1$; 4.76 %), burglary ($n = 1$; 4.76 %), credit card/check fraud ($n = 1$; 4.76 %), money laundry ($n = 1$; 4.76 %), lying under oath ($n = 1$; 4.76 %), misuse of titles ($n = 1$; 4.76 %).

Education was comparable in both groups, $U = 223$, $z = -0.22$, $p = .826$ (rank-ordered data for the German school types Gymnasium, Realschule, and Hauptschule), whereas the mean age of the final samples differed ($m_{\text{Convicted Criminals}} = 41.0$ years, $m_{\text{Controls}} = 31.3$ years), $t(42) = 3.68$, $p < .001$. However, it is important to note that age did not correlate with the effects of rule-conformity on the movement trajectories reported below, neither when pooling the data of both groups—$r(\text{Age}, \Delta_{\text{MAD}}) = -0.138$, $r(\text{Age}, \Delta_{\text{AUC}}) = -0.143$—nor when computing the correlations separately for the group of convicted criminals—$r(\text{Age}, \Delta_{\text{MAD}}) = -0.125$, $r(\text{Age}, \Delta_{\text{AUC}}) = -0.132$—and the control group—$r(\text{Age}, \Delta_{\text{MAD}}) = 0.215$, $r(\text{Age}, \Delta_{\text{AUC}}) = 0.246$. Differences in age, thus, do not confound the reported between-group differences (for details regarding the reported measures, see the section "Data treatment").

All participants provided written informed consent and received monetary compensation for participation. The study was approved by the ethics committee of the University of Tübingen and was conducted in accordance with the Declaration of Helsinki.

Materials and procedure

Upon arrival in the designated testing room, participants were informed about the study and signed a written informed consent form. The participants were then instructed to complete the experimental task, which was then followed by questions on demographic information as well as self-report measures.

Data were collected on laptop computers with 14" WXGA displays. Participants operated a standard computer mouse with their right hand and placed their left hand on the space bar of the keyboard with cursor gain being disabled. Target stimuli were two astrological symbols (Aries vs. Gemini) that were mapped to a left and a right response, respectively (counterbalanced across participants). Participants were instructed to follow the original mapping rule in most trials (67 %) but to violate the rule in trials that explicitly prompted them to do so (33 %). We opted for instructed violations rather than freely chosen violations due to the findings of a pilot study, in which the majority of convicted criminals did not commit a single rule violation in the latter setting. This might be due to impression management, seeing that the task clearly shared features with the crimes the prisoners had been convicted for.

Each trial of the present experiment started with a compliance cue. This display featured the correct task mapping in the upper half of the screen. In rule violation trials, this screen additionally featured the word "FEHLER" (error), which prompted the participants to violate the original mapping rule, i.e., to commit an error by intention. Participants terminated the compliance cue at leisure by pressing the space bar. Subsequently, the screen was blanked and three areas appeared: The home area in the bottom center and the two target areas to the upper left and upper right of the screen. From this point onward, the mouse cursor was displayed as a small circle (0.5 cm in diameter), and the program continued only after the participant had moved inside the home area. Each area measured 1.6 cm in diameter and the inter-center distance between the home area and each target area was 12 cm, whereas the two target areas were separated by an inter-center distance of 14.8 cm.

The target stimulus appeared in the upper center of the screen after the cursor had spent a dwell time of 500 ms in the home area. Participants then were to move toward one of the target areas as indicated by the target stimulus and the preceding compliance cue. From this point on, we sampled the coordinates of the mouse cursor at 100 Hz. Initiation time (IT) was defined as the time from onset of the target stimulus until the cursor had left the home area. Movement time (MT) was recorded as soon as the cursor hit one of the target areas. Then, the cursor shrank and faded from the screen. The screen was cleared 500 ms later and the next trial began after an inter-trial interval of 1000 ms.

Each session started with six trials during which the experimenter supervised task execution. These trials consisted of three Aries and three Gemini symbols, two of each with rule-based cues and one of each with rule violation cue. Participants then completed one training block and six experimental blocks of 30 trials (15 trials with Aries and 15 trials with Gemini as target stimulus). In each block, ten trials (33 %) featured rule violation cues, whereas the remaining trials featured rule-based cues.

Data treatment

Trajectory data were preprocessed using custom MATLAB scripts to determine maximum absolute distance (MAD) and area under the curve (AUC) for each trial. Movements to the left were mirrored at the vertical midline. For both measures, we used a straight line from the movement's start point to its final point as a reference. Movement data were time-normalized to 100 points by linear interpolation. MAD was then computed as the (signed) maximum Euclidean distance from each of these points to the reference line (in px) with positive values indicating deviation in direction of the opposite target. Similarly, AUC was computed as the signed area between interpolated points and reference line (in px^2). Trials were discarded as outliers if any measure deviated more than 2.5 standard deviations from the respective cell mean.

Results

Results of the control group ($n = 23$) replicated previous findings in terms of an attraction of the mouse trajectory towards the alternative response when participants violated the stimulus–response mapping (Fig. 1). This apparent bias was qualified by higher maximum absolute distances (MADs) for rule violations than for rule-based responses ($\Delta_{MAD} = 9.88$ px), $t(22) = 5.03$, $p < .001$, $d = 1.05$, as well as larger areas under the curve (AUCs; $\Delta_{AUC} = 1836$ px^2), $t(22) = 4.63$, $p < .001$, $d = 0.97$. Similarly, rule violations took longer to be initiated than rule-based responses (initiation time, IT; $\Delta_{IT} = 90$ ms), $t(22) = 7.95$, $p < .001$, $d = 1.66$, and were also executed more slowly (movement time, MT; $\Delta_{MT} = 14$ ms), $t(22) = 2.90$, $p = .008$, $d = 0.60$ (Fig. 2). Thus, the results of the control group confirm that a rule violation is associated with a considerable deviation in the movement trajectories, suggesting that the participants were compelled to abide by the rule instead of breaking it.

A different picture emerged for the group of convicted criminals (Fig. 1). Even though rule violations took longer to be initiated than rule-based responses ($\Delta_{IT} = 118$ ms), $t(20) = 9.84$, $p < .001$, $d = 2.15$, execution of both types of responses was equally fast ($\Delta_{MT} = 10$ ms), $t(20) = 1.01$, $p = .325$, $d = 0.22$. Most importantly, no significant differences were observed for AUCs ($\Delta_{AUC} = 454$ px^2), $t(20) = 0.93$, $p = .364$, $d = 0.20$, or MADs ($\Delta_{MAD} = 3.64$ px), $t(20) = 1.83$, $p = .083$, $d = 0.40$. In sum, there was no evidence for violation-related effects on the movement trajectories (i.e., after responses had been initiated) in contrast to the pronounced effects observed in the control participants.

To further substantiate these apparent differences between convicted criminals and controls, we compared the results of both groups with mixed-model analyses of variance (ANOVAs) with rule compliance (rule-based vs. rule violation) as within-subjects factor and group (convicted criminals vs. controls) as between-subjects factor. These analyses yielded significant interactions of rule compliance and group for both, MADs, $F(1,42) = 4.96$, $p = .031$, $\eta_p^2 = 0.11$, and AUCs, $F(1,42) = 4.89$, $p = .033$, $\eta_p^2 = 0.10$. Similarly, the main effect of group was significant for both variables, because the group of convicted criminals showed overall smaller MADs, $F(1,42) = 7.60$, $p = .009$, $\eta_p^2 = 0.15$, and AUCs than the control group, $F(1,42) = 5.69$, $p = .022$, $\eta_p^2 = 0.12$ (for reasons of brevity, the main effect of rule compliance is not reported separately in these or the following analyses, all $ps \leq .029$). A significant main effect of group further emerged for ITs, $F(1,42) = 10.35$, $p = .002$, $\eta_p^2 = 0.20$, whereas the interaction of rule compliance and group showed a non-significant trend here, $F(1,42) = 2.94$, $p = .094$, $\eta_p^2 = 0.07$. MTs, by contrast, did not differ between groups and showed no interaction of rule compliance and group ($ps \geq .241$). Thus, whereas response planning was similarly affected by rule compliance in both groups, the trajectories of the executed movements were affected differentially with more pronounced effects of rule violations for the control group than for the group of convicted criminals.

Discussion

This study set out to validate previous experimental findings of cognitive conflict during deliberate rule violations. We hypothesized that convicted criminals with a stable history of severe, habitual rule-breaking behavior

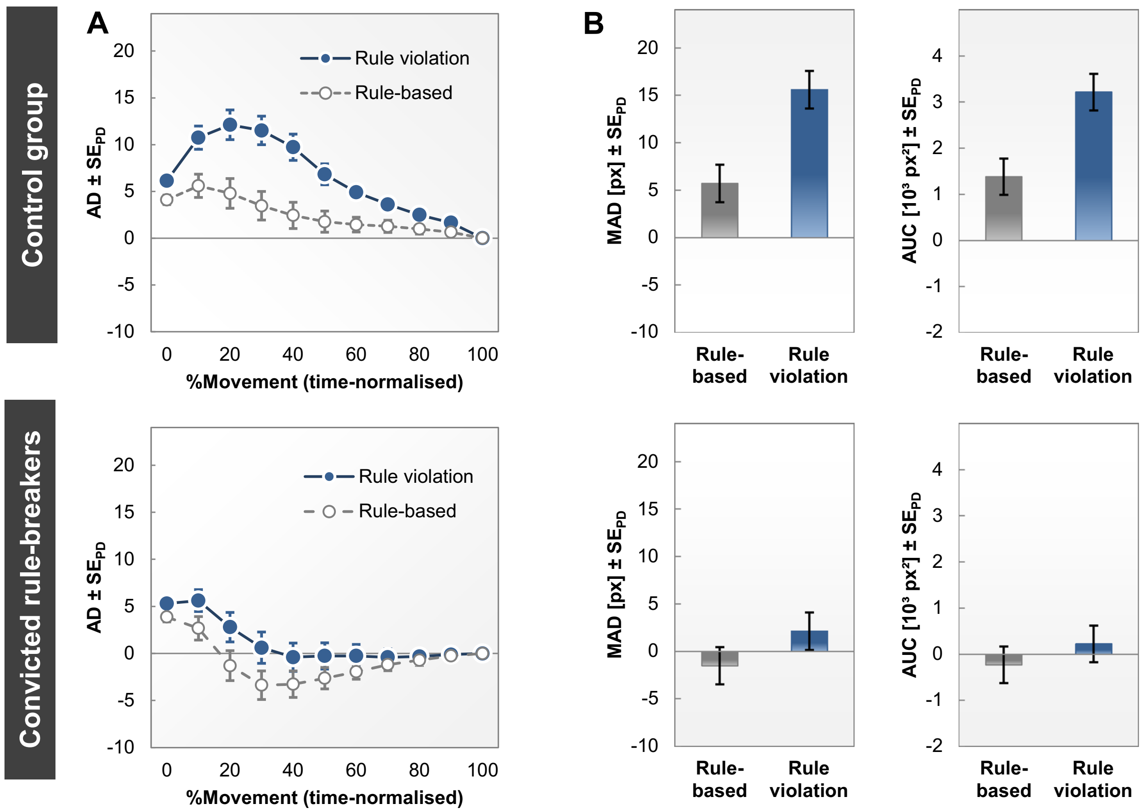

Fig. 1 Trajectory data of the control group without criminal history (*upper row*) and the group of convicted rule-breakers (*lower row*). In a simple two-choice classification task, participants were to make smooth mouse movements that were either in line with the instructed mapping rule (i.e., rule-based responses) or violated it. **a** Absolute distances (ADs) between the actual movement trajectory and a straight line from the movement start point to its end. ADs are plotted as a function of normalized movement time and rule compliance (rule-based responses vs. rule violations) with higher values for ADs indicating stronger deviations of the trajectory to the alternative target. **b** Corresponding descriptive statistics for maximum absolute distances (MADs) and areas under the curve (AUCs). *Error bars* indicate standard errors of paired differences (SE_{PD}; Pfister & Janczyk, 2013), computed separately for each group

would show less cognitive conflict during rule violations than control participants without criminal history. Indeed, the results replicated previous findings by showing that overriding an arbitrary rule is associated with an increased cognitive effort in average individuals (Pfister et al., 2016; Wirth et al., 2016b). A noticeable fingerprint on planning processes prior to action initiation (i.e., processes that are captured by ITs) was also evident in convicted criminals, but there was no impact of rule violations on the trajectory of the actually executed actions. Thus, our results show that previously documented markers of cognitive conflict during deliberate rule violations are differentially altered in a population that is characterized by objective, severe and habitual rule-breaking behavior.

But what is it that sets the performance of convicted rule-breakers apart? In average individuals, the cognitive mechanisms underlying rule-breaking have been described as a two-step process in which rule-based action tendencies are activated automatically in a first step and inhibited afterward to allow for the intended behavior (Pfister, 2013; Wirth et al., 2016b; for corresponding theoretical positions in the literature on deception, see, e.g., Debey, De Houwer & Verschuere, 2014; Foerster, Wirth, Kunde & Pfister, 2016; Walczyk, Roper, Seemann & Humphrey, 2003). Thus, more efficient inhibition of such rule-based action tendencies in convicted rule-breakers is one likely candidate mechanism that may underlie the observed data. Future studies could test this hypothesis by employing empirical measures of response inhibition such as the stop-signal reaction time task (Verbruggen & Logan, 2008). Relatedly, rule-breakers might better be able to represent rule violation actions as a separate task set without any connection to the original rule (see Wirth et al., 2016b, for corresponding discussion). Another possible explanation could be that convicted rule-breakers employ a more controlled mode of processing in violation-related situations (i.e., a more conservative decision threshold). This assumption is supported by the generally longer ITs of convicted criminals in comparison to the control participants, though further experimental studies would be necessary to substantiate this speculation. Finally, convicted criminals might differ from control participants in

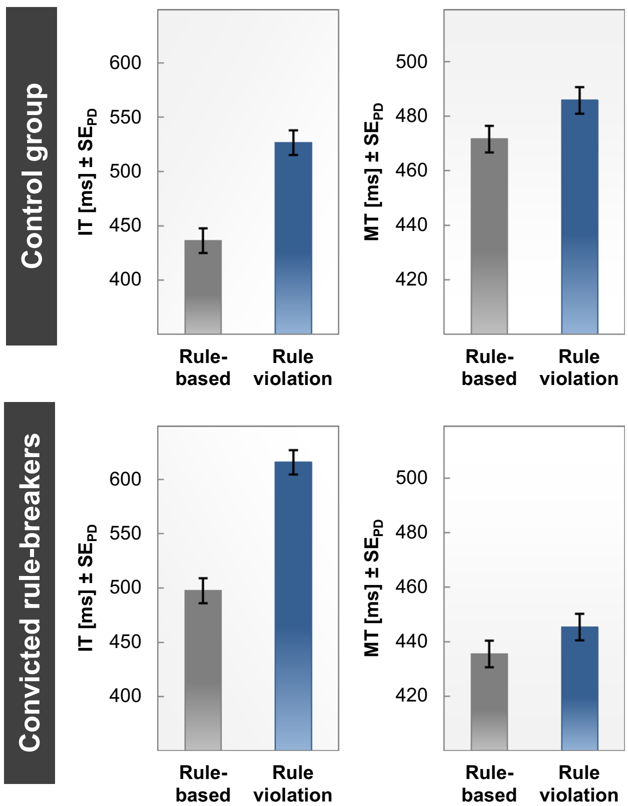

Fig. 2 Initiation times (ITs) and movement times (MTs) of the control group without criminal history (*upper row*) and the group of convicted rule-breakers (*lower row*). *Error bars* indicate standard errors of paired differences (SE_{PD}; Pfister & Janczyk, 2013), computed separately for each group

additional processes that are triggered by rule violations. For instance, recent findings suggest that even violations of simple stimulus–response mapping rules prime the processing of authority-related stimuli (Wirth, Foerster, Rendel, Kunde & Pfister, 2016a). It is conceivable that convicted criminals have a weaker association of rule violations and authority than average individuals and are, therefore, less affected during rule violations. Delineating these potential factors in incarcerated populations would be an important goal for future research to better understand the processes that are related to habitual rule-breaking behavior.

It must also be noted that the experimental design of both, previous studies and the present setup, obviously differs in several ways from rule violations that occur in everyday life. Most rule violations are unsolicited and occur mainly because the agent deliberately behaves as he or she intends rather than following a particular rule. The present setup is more related to "necessary violations" instead (Reason, 1990, 1995), which occur whenever following one rule implies to break another rule. Such necessary violations are also common in daily life, for example if a worker is urged to ignore a safety protocol by his or her superordinate or co-workers. On closer inspection, however, unsolicited and necessary violations still share a critical feature: In both situations, the agent performs an action that runs counter to a rule. The only difference is that this action is driven by a higher-order intention that derives either from own deliberation or from external events.

These considerations further highlight the potential and the importance to better understand the phenomenon of deliberate rule-breaking from a first-person perspective that focuses on the cognitive processes underlying conformity and non-conformity (cf. Moore & Gino, 2015; Kim & Hommel, 2015; Pfister et al., 2016). In addition to studying the above-mentioned factors that might differentiate between convicted criminals and average individuals, it will also be interesting to delineate the neural correlates and their interaction with motivational factors that may underlie individual differences observed in the present study. Recent evidence suggests that posterior medial frontal cortex may be a potential neural correlate (Klucharev, Munneke, Smidts & Fernández, 2011), as down-regulation of its activity was related to reduced conformity. In this context, it is important to note that rule-conformity and violations were neither sanctioned nor reinforced in the present study; nevertheless, the observed effects may still be influenced by motivational factors. For instance, it is possible that the differences between habitual rule-breakers and controls reported in this study are related to intrinsic factors, such as the inherent hedonic motivation for rule violations in habitual rule-breakers. Relatedly, rule violations can be guided by altruistic purposes and provide the basis for acts of civil courage, and it is yet to be determined whether individuals prone to these acts may exhibit similar alterations.

A further variable that likely affects rule-breaking behavior is the agent's cultural background. This study as well as previous studies on the cognitive mechanisms underlying rule violation exclusively addressed individuals from a Western culture. Findings from cross-cultural studies indicate, however, that Eastern cultures might promote adherence to social rules and norms (Cheung et al., 2001). Following previous research on deception (e.g., Seiter & Bruschke, 2007; Zhou & Lutterbie, 2005), it would be informative to compare rule-breaking behavior across cultures while also addressing the motives underlying different acts of violation (e.g., egoistic vs. pro-social; Fu, Lee, Cameron & Xu, 2001; Dmytro et al., 2014). Finally, an investigation of the relationship between cognitive conflict during rule violations and personality characteristics is an important avenue for future research attempts, such as addressing the role of the dark triad and callous-unemotional traits (Paulhus & Williams, 2002), as well as psychopathology, such as Antisocial Personality

Disorder. In light of these considerations, the present findings underscore the promising potential of understanding the phenomenon of deliberate rule violations from the perspective of the rule-breaker.

Acknowledgments We are grateful to Ryan Dutton for language editing and inspiring discussions. We thank Sandra Christian and Katharina Louis for the support in data collection.

Compliance with ethical standards

Funding This research was funded by the Promotion of Junior Researchers Program at the University of Tübingen and the LEAD Graduate School [GSC1028], a project of the Excellence Initiative of the German Federal and State Governments.

Conflict of interest The authors declare that there is no conflict of interest.

Ethical approval All procedures were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments.

Informed consent Informed consent was obtained from all individual participants included in the study.

References

Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs: General and Applied, 70*(9), 1–70.

Berns, G. S., Chappelow, J., Zink, C. F., Pagnoni, G., Martin-Skurski, M. E., & Richards, J. (2005). Neurobiological correlates of social conformity and independence during mental rotation. *Biological Psychiatry, 58*(3), 245–253.

Cheung, F. M., Leung, K., Zhang, J. X., Sun, H. F., Gan, Y. Q., Song, W. Z., & Xie, D. (2001). Indigenous Chinese personality constructs: Is the five-factor model complete?. *Journal of Cross-Cultural Psychology, 32*(4), 407–433.

de Waal, F. (2013). Animal conformists. *Science, 340*, 437–438.

de Waal, F., & Ferrari, P. F. (2010). Towards a bottom-up perspective on animal and human cognition. *Trends in Cognitive Sciences, 14*(5), 201–207.

Debey, E., De Houwer, J., & Verschuere, B. (2014). Lying relies on the truth. *Cognition, 132*(3), 324–334.

Disney, E. R., Elkins, I. J., McGue, M., & Iacono, W. G. (1999). Effects of ADHD, conduct disorder, and gender on substance use and abuse in adolescence. *American Journal of Psychiatry, 156*, 1515–1521.

Dmytro, D., Lo, J., O'Leary, J., Fu, G., Lee, K., & Cameron, C. A. (2014). Development of cultural perspectives on verbal deception in competitive contexts. *Journal of Cross-Cultural Psychology, 45*(8), 1196–1214.

Dommes, A., Granié, M.-A., Cloutier, M.-S., Coquelet, C., & Huguenin-Richard, F. (2015). Red light violations by adult pedestrians and other safety-related behaviors at signalized crosswalks. *Accident Analysis and Prevention, 80*, 67–75.

Fehr, E., & Fischbacher, U. (2004). Social norms and human cooperation. *Trends in Cognitive Sciences, 8*, 185–190.

Fehr, E., & Rockenbach, B. (2004). Human altruism: economic, neural, and evolutionary perspectives. *Current Opinion in Neurobiology, 14*, 784–790.

Foerster, A., Wirth, R., Kunde, W., & Pfister, R. (2016). The dishonest mind set in sequence. *Psychological Research*. doi:10.1007/s00426-016-0780-3 (In press).

Frick, P. J., & Dickens, C. (2006). Current perspectives on conduct disorder. *Current Psychiatry Reports, 8*(1), 59–72.

Frick, P. J., & Loney, B. R. (1999). Outcomes of children and adolescents with oppositional defiant disorder and conduct disorder. In H. C. Quay & A. E. Hogan (Eds.), *Handbook of disruptive behavior disorders* (pp. 507–524). Heidelberg: Springer.

Fu, G., Lee, K., Cameron, C. A., & Xu, F. (2001). Chinese and Canadian adults' categorization and evaluation of lie- and truth-telling about prosocial and antisocial behaviors. *Journal of Cross-Cultural Psychology, 32*(6), 720–727.

Kilduff, G., Galinksy, A., Gallo, E., & Reade, J. (2015). Whatever it takes to win: Rivalry increases unethical behavior. *Academy of Management Journal,*. doi:10.5465/amj.2014.0545.

Kim, D., & Hommel, B. (2015). An event-based account of conformity. *Psychological Science, 26*, 484–489.

Kimbrough, E. O., & Vostroknutov, A. (2016). *Journal of the European Economic Association*. doi:10.1111/jeea.12152 (In press).

Klucharev, V., Munneke, M. A., Smidts, A., & Fernández, G. (2011). Downregulation of the posterior medial frontal cortex prevents social conformity. *The Journal of Neuroscience, 31*, 11934–11940.

Kool, W., McGuire, J. T., Rosen, Z. B., & Botvinick, M. M. (2010). Decision making and the avoidance of cognitive demand. *Journal of Experimental Psychology: General, 139*(4), 665–682.

Milgram, S. (1963). Behavioral study of obedience. *The Journal of Abnormal and Social Psychology, 67*, 371–378.

Milgram, S. (1974). *Obedience to authority: An experimental view*. New York: Harper & Row.

Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*(4), 674–701.

Moffitt, T. E. (2003). Life-course-persistent and adolescence-limited antisocial behavior: a 10-year research review and a research agenda. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), *Causes of conduct disorder and juvenile delinquency* (pp. 49–75). New York: Guilford Press.

Moffitt, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course-persistent and adolescence-limited antisocial pathways: Follow-up at age 26 years. *Development and Psychopathology, 14*(1), 179–207.

Moore, C., & Gino, F. (2015). Approach, ability, aftermath: A psychological process framework of unethical behavior at work. *The Academy of Management Annals, 9*(1), 235–289.

Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality, 36*(6), 556–563.

Pfister, R. (2013). *Breaking the rules: Cognitive conflict during deliberate rule violations*. Berlin: Logos.

Pfister, R., & Janczyk, M. (2013). Confidence intervals for two sample means: Calculation, interpretation, and a few simple rules. *Advances in Cognitive Psychology, 9*, 74–80.

Pfister, R., Wirth, R., Schwarz, K., Steinhauser, M., & Kunde, W. (2016). Burdens of non-conformity: Motor execution reveals cognitive conflict during rule violation. *Cognition, 147*, 93–99.

Reason, J. (1990). *Human error*. New York: Cambridge University Press.

Reason, J. (1995). Understanding adverse events: Human factors. *Quality in Health Care, 4*, 80–89.

Sampson, R. J., & Laub, J. H. (1992). Crime and deviance in the life course. *Annual Review of Sociology, 18*, 63–84.

Seiter, J. S., & Bruschke, J. (2007). Deception and emotion: The effects of motivation, relationship type, and sex on expected feelings of guilt and shame following acts of deception in United States and Chinese samples. *Communication Studies, 58*(1), 1–16.

Serota, K. B., & Levine, T. R. (2015). A few prolific liars: Variation in the prevalence of lying. *Journal of Language and Social Psychology, 34*(2), 138–157.

van de Waal, E., Borgeaud, C., & Whiten, A. (2013). Potent social learning and conformity shape a wild primate's foraging decisions. *Science, 340*, 483–485.

Verbruggen, F., & Logan, G. D. (2008). Response inhibition in the stop-signal paradigm. *Trends in Cognitive Sciences, 12*(11), 418–424.

Vu, K.-P. L. (2007). Influences on the Simon effect of prior practice with spatially incompatible mappings: Transfer within and between horizontal and vertical dimensions. *Memory & Cognition, 35*(6), 1463–1471.

Vu, K.-P. L., Proctor, R. W., & Urcuioli, P. (2003). Transfer effects of incompatible location-relevant mappings on a subsequent visual or auditory Simon task. *Memory & Cognition, 31*, 1146–1152.

Walczyk, J. J., Roper, K. S., Seemann, E., & Humphrey, A. M. (2003). Cognitive mechanisms underlying lying to questions: Response time as a cue to deception. *Applied Cognitive Psychology, 17*(7), 755–774.

Wirth, R., Foerster, A., Rendel, H., Kunde, W., & Pfister, R. (2016a). Looking for trouble, then looking for cops: Rule violations sensitize towards authority-related stimuli (Manuscript under review).

Wirth, R., Pfister, R., Foerster, A., Huestegge, L., & Kunde, W. (2016b). Pushing the rules: Effects and aftereffects of deliberate rule violations. *Psychological Research, 80*(5), 838–852.

Yap, A. J., Wazlawek, A. S., Lucas, B. J., Cuddy, A. J. C., & Carney, D. R. (2013). The ergonomics of dishonesty: The effect of incidental posture on stealing, cheating, and traffic violations. *Psychological Science, 24*(11), 2281–2289.

Zhou, L., & Lutterbie, S. (2005). Deception across cultures: Bottom-up and top-down approaches. In P. Kantor, et al. (Eds.), *Intelligence and security informatics* (pp. 465–470). Berlin: Springer.