
BRIEF REPORT

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Sequential Effects in Important Referee Decisions: The Case of Penalties in Soccer

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In a study on penalty decisions in soccer, 115 participants made decisions as referees for each of 20 videotaped scenes from an actual match. In three scenes, defenders committed potential fouls in their penalty area. The first two scenes involved the same team and the third scene occurred in the opposite penalty area. Consistent with the assumption that judges' initial decisions have an impact on later decisions, we found a negative correlation between participants' successive penalty decisions concerning the same team, and a positive correlation between successive penalty decisions concerning first one and then the opposing team.

Key words: applied social cognition, judgment biases in sports, concession decisions

Whether or not to award a penalty in a given situation is a very important decision in soccer matches. For example, Germany won the World Cup Final in 1990 against Argentina, 0:1, by scoring the only penalty-kick of that match. According to the rules of the Fédération Internationale de Football (FIFA), a penalty should be awarded against a team that commits an offense inside its own penalty area, for example tripping an opponent. Earlier decisions in the match should have no influence on a penalty decision. In media reports, however, it has frequently been alleged that referees tend to make so-called concession decisions. Most intriguing is the claim that the probability of awarding a penalty to a team in an ambiguous foul situation increases if no penalty has been awarded to the same team in a similar situation before.

This phenomenon, which constitutes a type of contrast effect in a sequence of important decisions, also seems to be obvious to those who frequently view sports games. Still, media reports and sports fans could be wrong and it may be that this contrast effect does not really exist. To the best of our knowledge, to date there has been no empirical evidence for such an effect. Although there is some research on the specific tasks of judges, umpires, and referees in sports (Ford,

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Gallagher, Lacy, Bridwell, & Goodwin, 1997; Mohr & Larsen, 1998; Oudejans, Verheijen, Bakker, et al., 2000; Plessner, 1999; Ste-Marie & Lee, 1991), the possibility that sequential effects could make their way through the repetition of similar decisions has been almost completely neglected.

Some researchers have argued that decisions of officials in sports can be understood as a product of social information processing (Frank & Gilovich, 1988; Plessner & Raab, 1999). From a social psychological point of view, it is not surprising that people's judgments can be influenced by their earlier decisions (Festinger, 1957). Some models in social cognition have even tried to predict the exact circumstances that lead to divergent contrast and assimilation effects in social judgments (Schwarz & Bless, 1992; Stapel & Winkielman, 1998). According to these theoretical approaches, such effects can occur spontaneously, without the possibility of being consciously controlled by the individual. However, most of these models would predict—to the extent that they are applicable to the present context—an assimilation (i.e., a positive correlation) rather than a contrast effect (i.e., a negative correlation) in a sequence of penalty decisions.

The goal of the present study was to answer the following questions: (a) Are there, in general, contingencies between successive penalty decisions? (b) Does the probability of awarding a penalty to a team increase if no penalty has been awarded to that team in a similar situation before? (c) If contingencies were to be found, are they specific to penalty decisions or are they but a general phenomenon of decisions made by referees in a soccer match?

Method

Participants

A total of 115 German male participants, 58 licensed referees and 57 soccer players, took part in the experiment. The mean age of the referees was 31.6 years ($SD = 12.1$) and they averaged 5.7 years of experience as referees ($SD = 9.6$). The players averaged 23.5 years of age ($SD = 8.2$) and had some experience as referees in training matches but were not licensed referees. Data were collected at different sport locations, such as soccer clubs. At each location the participants were randomly assigned to one of four experimental conditions, always including the two focused in this report (see below). As a reward for their participation, they took part in a lottery. The prize of the lottery was a subscription to the German soccer journal *Kicker*, which had a value of approximately \$150 at the time.

Materials and Design

Participants had to make decisions for each of 20 videotaped scenes from a soccer match in the Spanish Primera Division (Rayo Vallecano vs. Real Madrid, 2:3, November 6, 1999). We had chosen this match from a pool of about 50 videotaped matches according to several criteria such as good visibility in different scenes and the likelihood that German participants were not familiar with it. Indeed, none of our participants indicated that he was familiar with the match before the experiment. Most important, the match contained two successive ambiguous foul scenes inside the penalty area of one team and a third ambiguous foul scene inside the

penalty area of the opposing team.¹ It also contained a similar sequence of potential free-kick scenes.

On the videotape, both sequences—potential penalty and free-kick situations—were filled with scenes in which the ball was kicked outside the field and participants had to decide, for example, which team was to continue the match. Further ball-out and free-kick situations were included on the tape to dilute the salience of the target sequences. Each scene was announced by showing the minute of play. The scene continued until a question mark appeared on the screen. All scenes were stopped before the decision of the original referee became clear. No score was visible in any scene, and no goal was shown.

For about one-third of the participants ($n = 43$), the videotape was edited so that instead of the first foul scene inside the penalty area, a ball-out situation appeared on the screen. We expected the remaining participants ($n = 72$) to divide into two groups based on their decisions: (a) those who award a penalty in the first scene, and (b) those who do not. Therefore, we would be able to compare the probability of awarding a penalty in the second scene under three conditions: no prior penalty decision; penalty awarded in a prior situation; or no penalty awarded in a prior situation.

Before the test phase began, participants had to make decisions in three practice trials in which scenes were presented from different European league matches (one free-kick and two ball-out situations).

Procedure

Participants were asked to make decisions for several scenes as if they were real referees in a soccer match. Starting with a training phase, a scene was shown on the television screen until the experimenter stopped the videotape. Then participants immediately had to announce their decisions (e.g., free-kick for the team in blue), which were recorded by the experimenter. Then the next scene appeared on the screen. After the practice phase, participants were told the test phase would now begin and that all following scenes were from the same match in which they would have to act as referee. Following the decisions for all 20 scenes, participants were given a small booklet with questions concerning personal data, including questions about their experience as referees. Furthermore, they were asked if they had previously seen the scenes used in the experiment or knew anything about that particular match.

Results

Initial analyses showed that decisions (e.g., relative frequency of free-kicks or penalties awarded) did not depend on whether the judges were referees or players. Indeed, there were no significant differences between referees' and players' decisions for any of the 20 scenes of both videotapes. Therefore, the data for referees and players were collapsed for the following analyses.

¹As a single case of evidence for the assumed contrast effect, the original referee awarded a penalty only in the second situation, although slow-motion video show that in comparison to the first scene, the defender's offense was less clear in the second scene.

Penalty Decisions

Participants' decisions for the three foul scenes inside the penalty areas were each categorized as "penalty awarded" (e.g., penalty and warning) and "no penalty awarded" (e.g., corner).

We found that the penalty decisions of participants who had to decide for the first two penalty scenes that involved the same team were negatively correlated, $\Phi = -.29$, $p = .023$. In fact, not a single participant awarded a penalty in both situations. Compared to those who saw a ball-out situation instead of the first foul scene in the penalty area (no prior penalty decision), the probability of awarding a penalty in the second scene decreased when they had awarded a penalty before (penalty awarded in a prior situation) and increased when they had not (no penalty awarded in a prior situation), $F(2, 112) = 4.12$, $p = .019$, as shown below:

- No prior penalty decision ($n = 43$): 18.6%
- Prior penalty decision—
 - Penalty awarded ($n = 13$): 0%
 - No penalty awarded ($n = 59$): 33.9%

Because of the negative correlation between the decisions concerning the first two scenes, we calculated a score for all participants that indicated whether they awarded a penalty at all in one of the first two scenes. Thus we were able to compare the penalty decisions concerning first one and then the opposing team over all experimental conditions. In contrast to the decisions concerning the same team, we found a positive correlation between this score and the decisions made for the foul scene inside the opposite penalty area, $\Phi = .30$, $p = .029$. Therefore, awarding a penalty to one team increased the probability of giving a penalty to the opposing team, $t(113) = 2.21$, $p < .029$, as shown below:

- No penalty awarded ($n = 62$): 22.6%
- Penalty awarded ($n = 53$): 41.5%

Taken together, whereas the finding concerning successive penalty decisions about the same team suggests a contrast effect, the finding concerning successive penalty decisions about first one and then the opposing team suggests an assimilation effect.

Free-Kick Decisions

Analogous to the analyses of the penalty decisions, we calculated correlation coefficients for the sequence of three free-kick decisions. Neither successive decisions concerning the same team nor successive decisions concerning first one and then the other team correlated significantly, $\Phi = .05$, $p = .59$, and $\Phi = .06$, $p = .49$, respectively. Hence, decisions in free-kick situations were independent of earlier decisions in similar situations.

Discussion

This study provides empirical evidence for the claim that important referee decisions, such as awarding a penalty in a given situation, are influenced by previous decisions in similar situations. The probability of awarding a penalty increased if no penalty had been awarded to the same team before. Moreover, we found a negative contingency between successive penalty decisions concerning the same team and a positive contingency between successive penalty decisions concerning first one and then the other team. In contrast to what is prescribed by the FIFA rules, when evaluating a given situation, referees, as well as soccer players acting as referees, were biased by their own earlier decisions. Nonetheless, these findings held only for penalty decisions. Decisions in less important free-kick situations were not influenced in the same manner, as is evident from the absence of significant correlations between them.

An obvious difference between penalty and free-kick decisions is the fact that the latter are much more frequent in a match than penalty decisions. Furthermore, the consequences of penalty decisions are much more significant because they can determine the winner and loser of a game. In light of the importance of penalty decisions, referees' judgments may reflect a compromise between actual observations and some "unwritten rules" associated with penalties. It has been shown in other sport contexts that such unwritten rules can bias the judges' decisions (Plessner & Raab, 1999). For example, gymnastics judges were found to be systematically influenced by the unwritten rule that gymnasts are typically placed in rank order from poorest to best for a team competition (Scheer, 1973).

In the present context, it is likely that the possibility of awarding a penalty is perceived as an option that one should not take too often. This unwritten rule could partly explain the contrast effect in successive penalty decisions concerning the same team. That is, once participants awarded a penalty to a team, they are assumed to shift their criterion for awarding a penalty to the same team to a higher level in subsequent situations. This process corresponds to predictions for successive judgments that can be derived from Martin's (1986) set-reset model of impression formation. Moreover, penalty situations may result in decisions that are somewhat equality-oriented (Van Lange, 1999). This orientation could lead to a concession decision, as a kind of summary response to repeated offenses, as well as to the assimilation effect we found when both teams were involved. These assumptions, however, are only speculative so far. The present study provides a useful setting for further studies of sequential effects, or biases, and their underlying cognitive mechanisms in important decisions on the part of referees.

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