

Synchrony and the Social Tuning of Compassion

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Although evidence has suggested that synchronized movement can foster cooperation, the ability of synchrony to increase costly altruism and to operate as a function of emotional mechanisms remains unexplored. We predicted that synchrony, due to an ability to elicit low-level appraisals of similarity, would enhance a basic compassionate response toward victims of moral transgressions and thereby increase subsequent costly helping behavior on their behalf. Using a manipulation of rhythmic synchrony, we show that synchronous others are not only perceived to be more similar to oneself but also evoke more compassion and altruistic behavior than asynchronous others experiencing the same plight. These findings both support the view that a primary function of synchrony is to mark others as similar to the self and provide the first empirical demonstration that synchrony-induced affiliation modulates emotional responding and altruism.

Keywords: synchrony, compassion, altruism

Primatologists and animal behaviorists have argued that coordinated action is an important skill of social animals, facilitating learning, affording protection to the group by enabling collective responses to danger, and forming and strengthening alliances among group members (Connor, Smolker, & Bejder, 2006; de Waal, 2008). Although the majority of research on coordinated action in humans has focused on nonconscious mimicry (i.e., instances in which individuals enact movements previously engaged in by others within the context of a social interaction), the importance of instances in which movements occur in a temporally organized fashion, often in unison, outside of the context of interpersonal exchange has begun to receive growing attention (Macrae, Duffy, Miles, & Lawrence, 2008; Miles, Nind & Macrae, 2009; Richardson, Marsh, & Schmidt, 2005; Wiltermuth & Heath, 2009; Valdesolo, Ouyang, & DeSteno, 2010). Such synchronous, as opposed to mimicked, actions are theorized not to constitute a dynamic give-and-take between interaction partners but rather to function as subtle cues that both signify joint purpose and enhance coordinated, goal-directed activities.

In accord with this view, researchers from several disciplines have speculated that synchronous movement may serve as a cooperation-enhancing mechanism, seemingly binding individuals together into a larger whole and, thereby, facilitating reciprocal responses among them (Ehrenreich, 2006; Haidt, Seder, & Kesebir, 2008; McNeill, 1995; Wilson, Van Vugt & O’Gorman, 2008). Supporting this perspective, work by Wiltermuth and Heath (2009) has shown not only that motor synchrony leads to increased cooperation on economic tasks, but also that individuals engaging in such synchrony evidence an increased sense of joint identity, or of being on the “same team.” Work from our own lab, moreover, has shown that the effects of synchrony on identity are not limited to perceptions of team affilia-

tion, but also extend to direct perceptions of interpersonal similarity; synchrony leads individuals to believe that counterparts moving in unison are, in point of fact, increasingly similar to themselves in terms of personal attributes (Valdesolo, Ouyang & DeSteno, 2010). Taken together, these findings suggest that synchrony may function as an implicit marker of similarity by leading individuals, at least for a short time, to perceive themselves as united.

To our minds, such emergent increases in perceived similarity not only provide a rationale for the enhanced cooperation shown to occur among synchronous individuals, but also raise the possibility that synchronous individuals would be likely to engage in greater efforts to protect and aid each other when victimized by external forces. Furthermore, it suggests a possible role in eliciting discrete emotional responses—an as yet untested effect of synchrony. Given past work showing that compassion and altruism are preferentially directed toward similar others (e.g., Burnstein, Crandall, & Kitayama, 1994; Krebs, 1975; Preston & de Waal, 2002; Sturmer, Snyder, & Siem, 2006) we posited that if synchrony acts to indicate increased similarity, it should serve as a dynamic marker of affiliation that would, in turn, increase emotional responding to and altruistic behaviors toward synchronous others in distress.

Similarity and Synchrony-Induced Compassion

Altruistic action is often theorized to stem from a specific, other-oriented emotional response, termed compassion or empathic concern (cf. Goetz, Keltner, & Simon-Thomas, 2010).¹ This emotion represents a fundamental state aimed at motivating direct

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¹ We use the term *compassion* to denote an emotion focused on concern for the wellbeing of another. In this capacity, we are referring to a state quite similar to what Batson (1998) terms *empathic concern*. Given that the term *empathy* is most frequently used to refer to a cognitive process by which individuals simulate the emotional state of another (cf. Bock & Goode, 2006), we have adopted the present terminology to denote that we are not referring to emotional contagion, but rather to a distinct other-oriented moral emotion (cf., Oveis et al., 2010).

relief of another's distress. However, the intensity of compassion to the plight of others should operate under the constraints implied by reciprocal altruism (Trivers, 1971) for it to be adaptive. Aiding others is often costly both in terms of physical and psychological resources; consequently, compassion might be tuned by the social context in order to maximize the potential for reciprocal payoffs where possible. That is, although compassion may be evoked and lead to altruistic action in response to any human suffering, the degree of compassion experienced and, thereby, help offered should track the likelihood that victims will provide subsequent benefits (cf. de Waal, 2008; Krebs, 1975; Preston & de Waal, 2002). Similarity provides an excellent metric for making this assessment as it can be flexibly defined (cf. Tversky, 1977), using both static (e.g., degree of genetic relation) and emergent (e.g., changing group affiliations) criteria.

Although work on the links between compassion and social perception is just beginning, recent work by Oveis and colleagues (Oveis, Horberg, & Keltner, 2010) offers support for the notion that compassion and perceived similarity are indeed linked. In a series of studies, Oveis et al. demonstrated that experimentally induced increases in compassion resulted in corresponding increases in the judged similarity of others to oneself. In essence, feelings of compassion lead people to believe that others were more like them. The reverse, we suspect, is likely true as well: individuals experiencing the same misfortunes may nonetheless evoke different levels of compassion as a function of their perceived similarity to the observer.

Given the import of directing costly social efforts in ways that are likely to maximize reciprocation, we suspected that the mind would be attuned to even the most subtle and dynamic indicators of social cohesion. Consequently, we suspected that synchrony should lead individuals to feel more compassion for synchronized others and that this compassion would mediate subsequent altruistic acts to assist them. Confirmation of this finding would provide the first evidence that synchrony can directly modulate emotional responding, and in so doing, open a new avenue by which to examine its effects not only on altruism but also on other fundamental interpersonal behaviors.

Overview of Experiment

To examine this hypothesis, we designed a paradigm in which participants observed a moral transgression against an individual with whom they had previously engaged in synchronous or asynchronous hand tapping.² Immediately after viewing the transgression, participants provided their impressions of the victim, including assessments of perceived similarity and liking. They also reported the compassion they felt for the victim, and, at the end of the experiment, were presented with an opportunity to assist the victim anonymously in completing the onerous tasks she had been assigned. Those who chose to assist the victim were seated in a separate room and provided with tasks whose completion they believed would benefit the victim. They were then left alone and surreptitiously timed with respect to how long they worked to assist the victim. We predicted that individuals would feel more compassion and thus evidence more altruistic behavior toward synchronous as opposed to asynchronous others, and that this increased compassion would be mediated by increased perceptions of similarity.

Method

Participants

Sixty-nine individuals took part in the experiment and were randomly assigned to one of two conditions: synchronous or asynchronous movement with the victim.

Procedure

At the outset, the participant was brought into the laboratory along with two confederates. The experimenter informed one of the confederates that their first experimental task would occur in a separate lab, and the experimenter escorted the confederate out of the main laboratory. The experimenter returned and informed the participant and second confederate that the first part of the study would examine the relationship between rhythmic ability and decision making. As part of the supposed measure of rhythmic ability, participants and confederates sat across from each other at a table and in front of a computer with two sensors presumably measuring their ability to keep tempo with recorded tones. They were instructed to tap the beats that they would hear through their individual headphones by tapping on individual sensors placed on the table surface. They were told that at times they could be listening to the same tone sequence or to entirely different sequences. Then they either listened to the same audio clip and kept synchronous beats, or listened to different audio clips and kept asynchronous beats. The confederate was under specific instructions to synchronize his tapping with the participant's in the synchrony condition. Participants engaged in this task for three minutes, with the tones varying in frequency from 60 to 120 beats per minute (BPM).

After the synchrony manipulation, the participant and confederate returned to their individual computer workstations in order to complete several computerized questionnaires. Embedded in these questionnaires were similarity and liking measures. In order to measure perceptions of similarity, participants were told that the experimenters were interested in their impressions of others based on thin slices of behavior. Participants then answered several questions regarding the two confederates including the following two target questions. They were asked "To what extent do you feel similar in personality to the participant with whom you completed the rhythmic ability task?" Responses were made using a 7-point scale from "not at all similar" to "extremely similar." Participants also were asked to indicate how much they liked the other participant using a 7-point scale from "not at all" to "very much." After this section had been completed, the experimenter returned and escorted the confederate to a lab down the hall.

Next, the experimenter returned to the participant to give the participant instructions on the next task. The experimenter explained that the researchers were pretesting a new experimental design and were interested in obtaining objective feedback. More specifically, participants were told that in order to help remove any experimenter bias, certain participants would be assigning themselves and others to tasks. Participants were informed that their

² This paradigm is adapted from one we developed to examine responses toward moral transgressors (Valdesolo & DeSteno, 2007).

role was to act as impartial observer, providing feedback to experimenters regarding their views of the new experimental protocol. They were informed that they would be surreptitiously observing one of the other confederates as he went through this assignment procedure. To accomplish this goal, participants were told that one of the other participants would be brought back to the lab and seated at an adjacent computer. The participant would then be able to observe the confederate's actions and responses to the experimental protocol through the use of a yoked computer. That is, participants would be able to see on their screen what the confederate was reading and deciding in real time. Participants received the following instructions on their screen:

Your computer is connected to the adjacent computer. Another participant will be completing an experiment on that computer and you will be asked to follow along and observe on your screen everything that he or she reads and does. Note that the other participant will be unaware that this is happening. After approximately five minutes of observing, you will be asked to rate the new assignment protocol in terms of clarity and design as well as answer some questions concerning the performance of the participant.

Participants then were asked to click the mouse to connect the two computers. From this point forward, they were presumably observing the other participant's screen and were asked not to touch their computer until it disconnected and automatically moved them along to the evaluations.

After the computers had "connected," the participant waited while the experimenter brought in the confederate who had not participated in the synchrony manipulation to be observed (i.e., the transgressor). The transgressor was told that all instructions would be on the computer and to begin the experiment by clicking the mouse. The transgressor then simultaneously clicked his mouse as well as a second mouse surreptitiously connected to the back of the participant's computer. The mouse clicks set off a timed presentation which created the illusion that the participant was observing, on her own monitor, the transgressor go through the new experimental design.

Participants then "observed" the transgressor go through the following procedure. The transgressor was told that the experimenter was examining performance on two different tasks. The "green" task consisted of a brief survey combined with a short photo hunt that would take 10 minutes to complete. The "red" task consisted of a series of logic problems combined with a longer, tedious mental rotation measure taking 45 minutes to complete. Transgressors were then informed that, in accord with a newly developed assignment procedure meant to remove experimenters from direct awareness of assignment conditions, they would make decisions about which of the two tasks they and the participant in the other lab (i.e., the victim) would complete. Specifically, transgressors were told that they would assign either themselves or the victim to the green condition; the one not assigned to green would necessarily complete the red task. They were given the choice of using a computerized randomizer or assigning tasks according to preference. As part of these instructions, they were informed that most people felt using the randomizer was the fairest way to make assignments. At this point, the transgressor always opted to assign himself the green task and the victim the red task by personal preference (i.e., without using the randomizer). This constituted the fairness transgression.

After the transgression, the actual participant's computer "disconnected" from the transgressor's and, after a brief delay during which time the transgressor left the room and the experimenter brought back the victim, continued to the evaluation section which contained a series of questions regarding their views of the assignment procedure. Embedded in this section were items meant to assess participants' feelings regarding the situation of the victim who had to complete the red task. Compassion was measured as the mean response to a three-item measure using 7-point response scales (Cronbach's $\alpha = .71$): (a) sympathy for victim, (b) pity for victim, and (c) compassion for victim (embedded among distracters).

Finally, participants were informed on screen that they had completed their participation. They were also informed that, as they were aware, one of the two other participants had to complete a long and arduous task. They were told that it did not matter who completed this task, but that the work simply needed to be done. If they wished to assist the other participant, they should find the experimenter and tell him. They would then be given some of the task to do in private—the other participant would remain unaware of their efforts, but have less work to do. If they did not wish to help, they could simply leave with an easy and nonpublic escape, thereby marking choices to stay and anonymously assist as altruistic in nature (cf. Batson, 1998).

If participants notified the experimenter that they wanted to help, the experimenter escorted them out of the lab to a desk in a separate room. They were then given a packet of math and logic problems and were told the following:

You can just do as much as you have time for. Whatever you do not complete will be completed by the other participant after they have finished what they are working on now. Once you are done, just leave everything on the desk; the experimenter will pick it up later.

The experimenter then left the participant at the desk, while a hidden video camera recorded the time the participant spent working on the task.

Results

Results confirmed that prior engagement in motor synchrony with a victim led individuals to perceive him as more similar to themselves, $M_{\text{synchronous}} = 3.83$, $M_{\text{asynchronous}} = 3.03$, $t(67) = 2.26$, $p = .03$. Also as predicted, participants experienced more compassion for synchronized victims, $M_{\text{synchronous}} = 4.67$, $M_{\text{asynchronous}} = 3.88$, $t(67) = 4.06$, $p < .001$, chose to help synchronized victims more frequently, $f_{\text{synchronous}} = 17$ of 35, $f_{\text{asynchronous}} = 6$ of 34, $\chi^2(1) = 7.42$, $p = .006$, and did so for significantly longer periods of time, $M_{\text{synchronous}} = 407\text{s}$, $M_{\text{asynchronous}} = 93\text{s}$, $t(67) = 3.16$, $p = .002$ in comparison to unsynchronized victims.

In order to demonstrate the causal impact of perceived similarity on compassion and subsequent helping, we conducted the path analysis depicted in Figure 1. As noted above, synchrony resulted in increased perceptions of similarity with the victim. Of import, the magnitude of the causal path linking synchrony to compassion through enhanced similarity was reliable, thereby demonstrating partial mediation of compassion via synchrony-induced alterations in perceived similarity (MacKinnon products of coefficient $Z' = 4.97$, $p = .05$). Also as predicted, increased compassion directly led to greater altruism; the more compassion individuals felt for

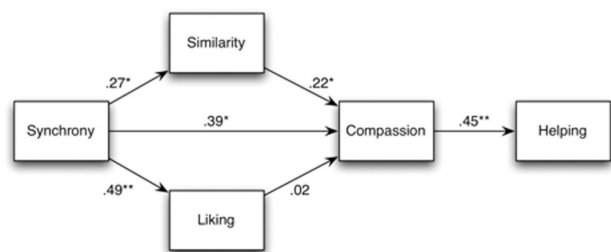


Figure 1. Path model depicting effects of synchrony on potential mediators for altruism. Parameters were estimated simultaneously. Synchrony is dummy-coded with higher values indicating synchrony. * $p < .05$. ** $p < .01$.

the victim, the longer they spent helping him. We considered the possibility that similarity might impact helping behavior outside of compassion as well, but this path proved negligible.

Finally, we examined liking for the victim as an alternative mediator by which synchrony might influence compassion. Although synchrony did increase liking for synchronized victims, differential liking did not directly influence compassion or helping. Within the current context, therefore, it appears that the ability of synchrony to increase altruism only occurs through similarity-induced variation in compassion.³

Conclusion

This experiment provides the first empirical demonstration of the effect of synchrony on altruism. In so doing, it offers the first indication that synchrony can differentially engage socially oriented emotions, thereby adding to the existing literature on the contextual sensitivity of compassion and prosocial behavior. Researchers have theorized about the potential influence of synchronous action on moral emotions (Ehrenreich, 2006; Haidt et al., 2008; Wilson et al., 2008), but, to date, there has been little evidence supporting this claim. Indeed, past research on cooperation has found no evidence that emotional states may be necessary for synchrony to elicit prosocial behavior (Wiltermuth & Heath, 2009).

In line with this view, previous work on synchrony has primarily focused on its ability to shape rapport and connectedness (Bernieri, 1988; Bernieri, Davis, Rosenthal & Knee, 1994; Cappella, 1997; Grahe & Bernieri, 1999; Tickle-Degnen & Rosenthal, 1990). We also found that synchrony enhances liking, but of import, we show that its influence on prosocial behavior can operate outside of this effect. In the present experiment, this could stem from the context of the interaction. Perhaps rapport and liking generated by coordinated action influenced subsequent prosocial responses only in instances where a meaningful social interaction has occurred and individuals can interpret that interaction as a legitimate basis for their feelings. Absent such grounds, prosocial responses to synchronous others might be determined by more automatic appraisals (e.g., similarity) that drive target-specific emotional responding. Furthermore, the present findings show that the processes by and conditions under which synchrony can evoke altruism are quite distinct from those elicited by mimicry. Mimicry effects do not occur under conditions of simultaneous actions explicit awareness, and lack of communicative interaction that characterizes the pres-

ent situation (cf. Chartrand & Bargh, 1999). Accordingly, synchrony may constitute a more basic signal by which the mind interprets similarity or unity and, consequently, tunes subsequent emotional responses and moral behaviors in line with adaptive pressures (cf. de Waal, 2008). In sum, by eliciting perceptions of similarity with con-specifics, synchronous action functionally directs the experience of compassion in response to the plight of those around us, interests us in their well-being, and motivates us to help on their behalf.

³ Apart from its effects through increased perceived similarity, synchrony also maintained a distinct effect on compassion. Whether this reflects the impact of phenomena separate from perceived similarity or the limitations of the employed measure to capture the full domains along which similarity manifests remains an open question. Our measure of similarity specifically assessed similarity with respect to personality characteristics. It may be that the manipulation resulted in enhanced perceptions of similarity along other dimensions or domains not captured by this instrument.

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