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Shared Plates, Shared Minds: Consuming From a Shared Plate Promotes Cooperation

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Abstract

A meal naturally brings people together, but does the way a meal is served and consumed further matter for cooperation between people? This research (N = 1,476) yielded evidence that it does. People eating from shared plates (i.e., a Chinese-style meal) cooperated more in social dilemmas and negotiations than those eating from separate plates. Specifically, sharing food from a single plate increased perceived coordination among diners, which in turn led them to behave more cooperatively and less competitively toward each other, compared with individuals eating the same food from separate plates. The effect of sharing a plate on cooperation occurred among strangers, which suggests that sharing plates can bring together more than just allies.

Keywords

food consumption, cooperation, coordination, social dilemma, negotiation, open data, open materials, preregistered

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Cultures around the world vary not only in their food traditions but also in how they serve food at the table and, subsequently, share it among diners. For example, a Chinese or an Indian meal is made up of shared dishes (i.e., family style), which prompts diners to serve themselves a single portion of food and coordinate their consumption with others to ensure that everyone receives a fair share. Alternatively, in a French-style meal, diners are served individual plates of food, which could require less coordination with other diners around the table. Is it possible that these different styles of food consumption translate into coordination beyond food sharing? Would diners who share food be more likely to cooperate on other tasks? This research suggests that this is indeed the case—that serving food from a single plate can increase cooperation.

The notion that a meal can bring people together is both intuitive and empirically supported. People prefer to eat together than alone (Ratner & Hamilton, 2015; Rozin, 2005), and eating similar foods is a cue for social connection, with people feeling closer to and cooperating more with others who consume similar foods (Fawcett & Markson, 2010; Liberman, Woodward, Sullivan, & Kinzler, 2016; Woolley & Fishbach, 2017). However, moving beyond getting together and eating similar foods, we asked whether sharing a plate with another person, and the required coordination that follows, influences social interactions.

On the one hand, sharing food with other people may highlight food scarcity and, as a result, suppress cooperation (Herr, 1986; Neuberg, 1988). Indeed, the scarcity–competition association (Bargh & Chartrand, 1999; Morris, Menon, & Ames, 2001; Ramanathan & Menon, 2006) suggests that reminders of resource scarcity activate a competitive orientation, leading people to prioritize their own welfare over that of others (see also Roux, Goldsmith, & Bonezzi, 2015). For example, perceiving food scarcity decreased the likelihood that people shared financial resources with others (Aarøe & Petersen, 2013; Petersen, Aarøe, Jensen, & Curry, 2014). On the other hand, sharing food involves coordination: Diners should attend to other diners' needs—whether and how much others served themselves, as

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well as others' movements—as they wait their turn to reach for the common source of food.

Looking at a typical shared-plate meal, we predicted that sharing plates would increase cooperative behavior among people because coordination over allocation of resources is a more frequent experience than competition over scarce food. Coordination requires sharing another person's perspective—taking his or her actions and needs into account—which then triggers attention to, and a better understanding of, the other person's needs (Sebanz, Bekkering, & Knoblich, 2006; Valdesolo, Ouyang, & DeSteno, 2010). Accordingly, attending to the portion of food that someone takes may lead people to attend to that person's other needs and accommodate those needs with their behavior.

Naturally, sharing a plate is not the only coordinated behavior that people engage in and that can serve to foster cooperation. For example, armies train by marching in step (McNeill, 1995), and religions incorporate coordinated singing and chanting into their rituals, possibly to foster cooperation within the group (Wiltermuth & Heath, 2009). Joint actions such as these involve coordinated behaviors that lead to improved cohesiveness between group members (Haidt, Seder, & Kesebir, 2008). Sharing plates can similarly facilitate group coordination. Further, sharing plates is something that people do starting at an early age, often on a daily basis, and often among people who fundamentally disagree with them on some issues; hence, it could be a useful tool for increasing cooperation.

We accordingly tested our hypothesis that sharing plates increases cooperation in the context of an interaction between strangers who hold opposing interests (e.g., two sides in a negotiation conflict or a bidding war). In these situations (i.e., social dilemmas), people choose how much to compete or cooperate with their counterpart through more or less aggressive behavior. We predicted that having to coordinate food consumption via shared plates would increase cooperation.

Alternatively, consuming food from a shared plate may boost cooperation by increasing closeness, such that people who share plates feel more socially connected. Whereas people who eat together are perceived by others as closer (Kniffin & Wansink, 2012; Miller, Rozin, & Fiske, 1998), we did not expect that eating from a shared (vs. separate) plate would lead people to feel more socially connected or that sharing plates would increase cooperation only among friends. Because there is evidence that coordination drives the increase in cooperation (Knez & Camerer, 2000), we predicted that consuming food from a shared plate improves cooperation without requiring individuals to feel closer to one another. Thus, we predicted that sharing plates would boost cooperation among friends as well as strangers.

General Method

Across our studies, we report results of eating from shared (vs. separate) plates on cooperation, the corresponding effect-size estimate and its 95% confidence interval (CI), and the Bayes factor (BF_{10}), which represents evidence in favor of the alternative hypothesis (i.e., that there are differences between groups; Jeffreys, 1961), calculated using the *BayesFactor* package (Version 0.9.12-4.2; Morey, Rouder, & Jamil, 2018) in the R programming environment. We conducted a meta-analysis synthesizing the main results from eight studies (three main studies reported here and five additional studies reported in the Supplemental Material available online), including three preregistered studies, $d = 0.51$, $SE = 0.10$, 95% CI = [0.30, 0.72], $z = 4.86$, $p < .0001$. Raw data and supplements for all studies are available on the Open Science Framework (osf.io/7tssz).

Study 1: Sharing Plates Increases Cooperation in a Negotiation

Study 1 examined whether eating food from a shared plate, compared with eating food from individual plates, increases cooperation between two individuals. Participants took part in a wage-negotiation simulation (adapted from Sheldon & Fishbach, 2011; modeled after Lax & Weeks, 1985), in which negotiators needed to agree on an hourly wage through the exchange of bids and without talking. They further needed to reach an agreement within a minimal number of negotiation rounds, as each round represented a costly day of strike.

Method

Participants. Participants were run in pairs of strangers. We preregistered the study and collected data from 200 undergraduate and graduate students outside a campus café (107 female; age: $M = 23.57$ years, $SD = 8.80$). We originally ran a similar study with a smaller sample (see Study S1 in the Supplemental Material), and the larger sample size of the current study was calculated from the effect size observed in a meta-analysis of Studies 2 and 3 as well as Studies S1 to S3 and Study S5 in the Supplemental Material ($d = 0.61$). A sample size of 200 allowed us to detect an effect size (d) of 0.61 with 85% power at an alpha of .05. Participants received a $3 Amazon gift card for participating and a chance to win $50 on the basis of their performance.

Procedure. The study employed a 2 (consumption: shared vs. separate) × 2 (negotiation role: union vs. management) between-subjects design. A research assistant weighed out food ahead of time into two separate bowls or one

shared bowl, depending on the condition. In the separate-consumption condition, there were two 20-g tortilla chips bowls and two 25-g salsa bowls. In the shared-consumption condition, there was one 40-g tortilla chips bowl and one 50-g salsa bowl. For the separate-consumption condition, bowls were placed across from each other on a square table with individual salsa bowls next to them. For the shared-consumption condition, a chips bowl and a salsa bowl were placed in the center of the table.

A research assistant recruited pairs of strangers and positioned them across the table from each other. As part of our cover story, participants learned that we were studying how hunger impacts decisions and that they would be eating a snack before completing a decision-making game. Participants received instructions to eat the entire snack before starting the game (which all participants did). Participants next received instructions for the negotiation that detailed the negotiation procedure (via electronic PDF on an iPad), which the research assistant read aloud.

Participants learned that they would be negotiating an hourly wage rate during a strike and that they would enter a lottery for a $50 Amazon gift card on the basis of their performance in the negotiation (higher scores corresponded to more entries into the lottery). Within each pair, each participant was randomly assigned to the role of either union or management and learned that the goal was to settle on an hourly wage between $10 and $11 within 22 rounds (each round representing a day in the negotiation), with a strike set to initiate if a deal were not reached by the end of Round 2. All participants learned that union members wanted a higher wage for themselves (maximum set at $11), whereas management wanted a lower wage for the union (minimum set at $10). Both parties wanted to minimize the length of the strike, as each strike day was costly for both parties.

Participants were instructed not to talk during the negotiation. On each round, they silently exchanged bids over the wage. On the round in which management's offer was equal to or higher than the union's offer, an agreement was reached, and the negotiation ended with the final wage as the average between the last two offers (e.g., if the management offered $10.60 and the union offered $10.40, the settlement was $10.50). If an agreement were not reached by Day 20 of the strike (i.e., Negotiation Round 22), the final wage was set as management's final bid.

The main measure of cooperation was the number of strike days before an agreement was reached (i.e., number of rounds of negotiation – 2; range = −1 to 20). We calculated performance outcome scores for each player, which were a function of the wage rate agreed on and the total number of strike days, as a secondary measure of cooperation. In this negotiation simulation, the payoff structure was such that minimizing strike days (i.e., rounds) was equally as important as maximizing wage for union leaders and considerably more important than minimizing wage for managers (see Table 1). After reading the instructions, viewing the strike-cost table, and learning about two negotiation examples, participants began exchanging bids.

Table 1. Cost of Each Day of Striking for Management and for the Union (Study 1)

Round	Number of days on strike[a]	Cost of strike ($)	
		Management	Union
1	0	0	0
2	0	0	0
3	1	115,000	55,000
4	2	260,000	120,000
5	3	435,000	195,000
6	4	640,000	280,000
7	5	875,000	375,000
8	6	1,140,000	480,000
9	7	1,435,000	595,000
10	8	1,760,000	720,000
11	9	2,115,000	855,000
12	10	2,500,000	1,000,000
13	11	2,915,000	1,155,000
14	12	3,360,000	1,320,000
15	13	3,835,000	1,495,000
16	14	4,340,000	1,680,000
17	15	4,875,000	1,875,000
18	16	5,440,000	2,080,000
19	17	6,035,000	2,295,000
20	18	6,660,000	2,520,000
21	19	7,315,000	2,755,000
22	20	8,000,000	3,000,000

[a]The strike started on Round 3, hence no cost was incurred in Rounds 1 and 2.

We calculated the performance outcome scores for management using the following formula (from Lax & Weeks, 1985): (–$50,0000 × [*X* cents] – strike cost), where *X* is the number of cents above $10 that pairs agreed to at the end of the negotiation ($0.50 = 50). We calculated the performance outcome scores for the union using this formula: ($40,0000 × [*X* cents] – strike cost), where *X* is again the number of cents above $10. Participants received the information underlying this formula without being given the exact formula. As an example, if negotiations lasted for 8 days of strike (10 negotiation rounds), with the final negotiated hourly wage equaling $10.50, the payoff or cost to each party would be as follows—management: –$2,500,000 – $1,760,000 (cost of 8-day strike) = –$4.26 million; union: $2,000,000 – $720,000 (cost of 8-day strike) = $1.28 million. Performance outcome scores were consequential, as higher scores corresponded to more entries into the $50 lottery.

After participants reached an agreement on a wage (or after 20 strike days), the negotiation ended. Per our preregistration, we planned to recruit only strangers in our sample and confirmed that we successfully partnered strangers by measuring relationship status with two measures (r = .50, 95% CI = [.38, .59]): "How well do you know your partner in this study?" (0 = *do not know very well*, 6 = *know very well*) and "How close are you to your partner in this study?" (0 = *we are just acquaintances*, 6 = *we are very good friends*). Indeed, all partners were strangers to each other (M = 0.15, SD = 0.53).

Results

As per our preregistration, we analyzed the effect of condition on total strike days using a t-test analysis. If shared food consumption increases cooperation, this should lead to a faster resolution of the negotiation. As we predicted, pairs sharing food from the same bowl went into fewer days of strike (M = 8.72, 95% CI = [6.75, 10.69]) than pairs eating from separate bowls (M = 13.20, 95% CI = [11.24, 15.16]), $t(98) = 3.24$, $p = .002$, $d = 0.65$, 95% CI = [0.24, 1.05], $BF_{10} = 19.50$ (see Fig. 1).

We next analyzed our secondary measure of cooperation, the effect of condition and role on negotiation-performance outcome scores using a mixed-model analysis with consumption condition and role as fixed factors and pair as a random factor. As we predicted, we found a main effect of consumption condition, suggesting that, on average, participants in the shared-consumption condition performed better than those in the separate-consumption condition (shared: M = −$2.16 million, 95% CI = [−$2.71 million, −$1.60 million]; separate: M = −$3.46 million, 95% CI = [−$4.01 million, −2.90 million]), $F(1, 98) = 10.81$, $p = .001$, $\eta_p^2 = .10$, 95% CI = [.02, .22] (see Fig. 2). There was also a main effect of role: Union leaders received higher scores than managers, which was a feature of this exercise, $F(1, 98) = 1084.50$, $p < .001$, $\eta_p^2 = .92$, 95% CI = [.89, .93]. There was also a significant, unpredicted interaction, $F(1, 98) = 5.99$, $p = .016$, $\eta_p^2 = .06$, 95% CI = [.002, .16], indicating that the effect of shared plates was stronger for management (shared: M = −$5.41 million, 95% CI = [−$6.20 million, −$4.62 million]; separate: M = −$7.24 million, 95% CI = [−$7.98 million, −$6.49 million]), $t(98) = 3.39$, $p = .001$, $d = 0.68$, 95% CI = [0.27, 1.08], than for the union (shared: M = $1.10 million, 95% CI = [$0.66 million, $1.54 million]; separate: M = $0.32 million, 95% CI = [−$0.20 million, $0.85 million]), $t(98) = 2.30$, $p = .024$, $d = 0.46$, 95% CI = [0.06, 0.86]. Levene's test for equality of variances was not significant (cost to management: $F = 0.003$, $p = .957$; cost to union: $F = 2.98$, $p = .087$), and equal variances were assumed. The pattern of results remained unchanged if equal variances were not assumed—management: $t(97.69) = 3.39$, $p = .001$, $d = 0.68$, 95% CI = [0.27, 1.08]; union: $t(94.78) = 2.30$, $p = .024$, $d = 0.46$, 95% CI = [0.06, 0.86].

These results provide initial evidence that shared consumption increases cooperation among strangers. Participants who ate from shared (vs. separate) plates had fewer strike days and improved performance outcome scores as a result.

Fig. 1. Number of strike days (range = −1 to 20) in a wage negotiation, separately for pairs who shared plates and who ate from separate plates (Study 1). Fewer strike days indicate greater cooperation. Violin plots show the distribution of strike days (with dots for individual participants). Horizontal lines indicate means for each consumption condition, and error bars indicate standard errors.

Study 2: Sharing Plates Increases Cooperation in an Iterated Prisoner's Dilemma Game

Study 2 extended the previous finding using another measure of cooperation: performance in an iterated prisoner's dilemma game.

Method

Participants. Participants were run in pairs of strangers. We predetermined a sample size of 100 for the study on the basis of a medium-large effect size (f = .33) and collected data from 104 undergraduate and graduate students outside a campus café (56 female; age: M = 20.45 years, SD = 3.16; 4 participants failed to complete demographic questions). Participants received $5 and had a chance to earn $50 on the basis of their study performance.

Procedure. The study employed a single-factor (consumption: shared vs. separate) between-subjects design. A research assistant approached participants to take part

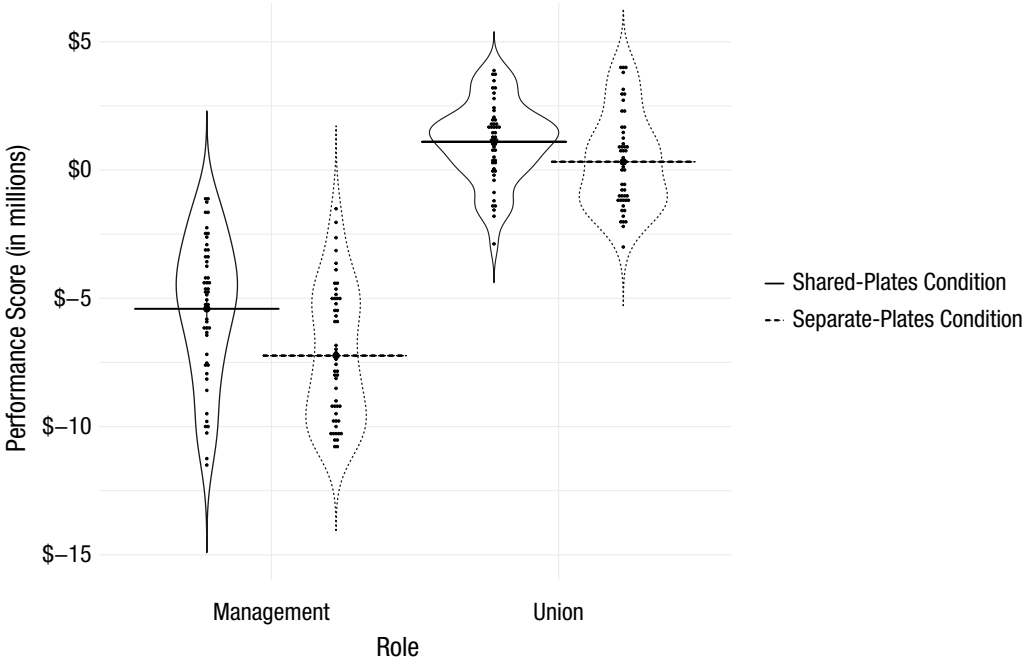

Fig. 2. Negotiation-performance outcome score as a function of role, separately for pairs who shared plates and who ate from separate plates (Study 1). Violin plots indicate the distribution of performance outcome scores (with dots for individual participants). Horizontal lines indicate means for each combination of consumption condition and role, and error bars indicate standard errors.

in a study that was supposedly on how hunger impacts decisions. Participants received Goldfish crackers to eat before they completed a 20-round version of a two-person prisoner's dilemma game, designed to simulate an airfare-pricing war (see Sheldon & Fishbach, 2011). In the shared-consumption condition, pairs received one Ziploc bag to share (24 g of crackers), and in the separate-consumption condition, each person in the pair received his or her own Ziploc bag (12 g of crackers). Participants finished their food before receiving instructions about the airfare-pricing game.

In the airfare-pricing game, both participants assumed the role of an airline executive. One person was assigned to Midwest Airways and the other to Air Chicago, and identical instructions were given for each role. Participants read that their job was to set weekly route prices for their specific airline, and they learned that their counterpart in the game would be setting prices for another airline. Participants were presented with two choices—a competitive choice and a cooperative choice—and the outcome depended on the decisions of both individuals (see Fig. 3).

The standard rate represented the cooperative choice, and the discounted rate represented the competitive choice. We took the frequency with which participants chose the standard rate as an indication of their cooperative behavioral tendency (total number of individual cooperation choices out of 20 rounds). Participants learned that players with the best performance outcome scores would be entered into a lottery for $50. Participants further learned that after each decision, both players would be informed of the other player's decision for a given round. Participants played the game for 20 rounds, indicating in each round whether they wanted to cooperate or defect.

	If your partner chooses "Standard Rate"	If your partner chooses "Discounted Rate"
If you choose "Standard Rate"	Your partner gets: **$5 MM** / You get: **$5 MM**	Your partner gets: **$7 MM** / You get: **$2 MM**
If you choose "Discounted Rate"	Your partner gets: **$2 MM** / You get: **$7 MM**	Your partner gets: **$3 MM** / You get: **$3 MM**

Fig. 3. Payoff matrix provided to participants in the iterated prisoner's dilemma game (Study 2). MM = million.

Our theory was that sharing plates would increase cooperation without increasing closeness. Alternatively, sharing plates would increase cooperation by increasing interpersonal closeness. To test for this alternative, we asked participants to rate experienced closeness to their partner after the game ended: (a) "To what extent does your partner seem likable?" (b) "To what extent does it seem you could get along with this person in the future?" (c) "Could you see yourself becoming close to this person?" and (d) "Could you see yourself becoming friends with this person?" (0 = *not at all*, 6 = *very much*). To confirm that consumption was not aversive to participants, we also asked about snack enjoyment: (a) "Do you think Goldfish crackers are tasty and are a good snack?" (0 = *not at all*, 6 = *very tasty; M* = 4.05, 95% CI = [3.69, 4.40]).

Results

We first analyzed the rate of cooperation for each individual using a mixed-model analysis, with food consumption as a fixed factor and pair as a random factor. As we predicted, sharing a single source of food increased the likelihood of cooperation in the 20-round prisoner's dilemma game (M = 63.27%, 95% CI = [55.32%, 71.22%]), compared with separate consumption (M = 42.88%, 95% CI = [33.00%, 52.77%]), $F(1, 50) = 5.83$, $p = .019$, $\eta_p^2 = .10$, 95% CI = [.002, .27], $BF_{10} = 3.73$ (see Fig. 4).

We collapsed the four items measuring closeness ($\alpha = .89$) and found a nonsignificant effect of consumption, $F(1, 48) = 0.90$, $p = .347$, $\eta_p^2 = .02$, 95% CI = [.00, .15], consistent with our theory that shared consumption increases cooperation among strangers and does not rely on a corresponding increase in interpersonal closeness. Testing for a null effect of shared (vs. separate) plates on closeness, we found a BF_{10} of 0.40, which provides evidence in favor of the alternative model ($BF_{10} > 1$), and a BF_{01} of 2.53, which provides evidence in favor of the null model ($BF_{01} > 1$). These BFs revealed anecdotal evidence that shared consumption did not significantly increase closeness (Jeffreys, 1961).

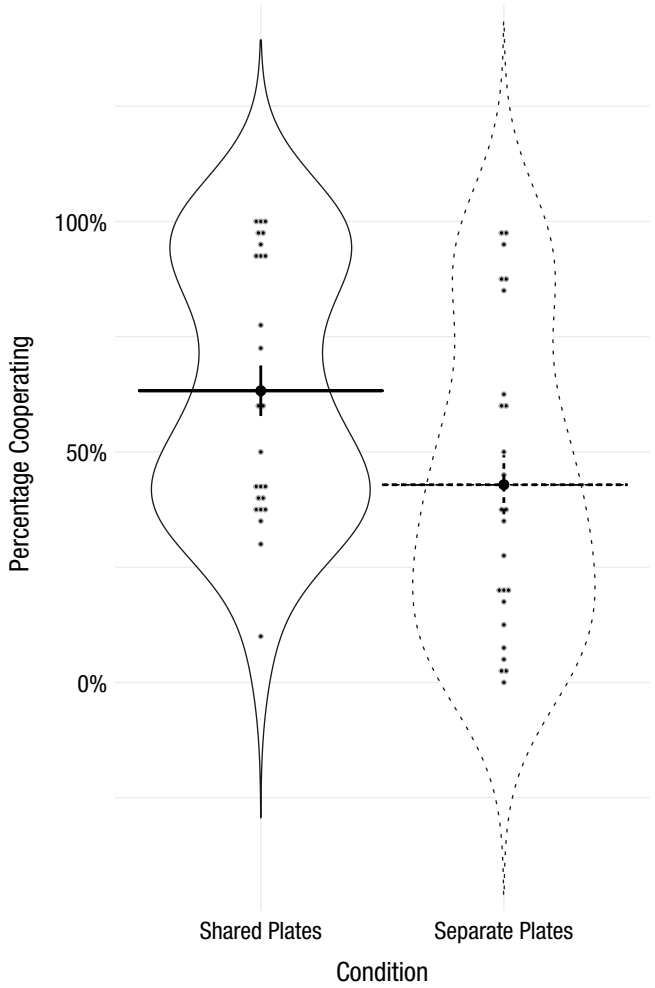

Fig. 4. Rate of cooperation, separately for pairs who shared plates and who ate from separate plates (Study 2). Violin plots indicate the distribution of cooperation rates (with dots for individual participants). Horizontal lines indicate means for each consumption condition, and error bars indicate standard errors.

Study 3: Sharing Plates Increases Cooperation in Negotiations Among Friends and Strangers

Our theory predicts that sharing plates increases coordination, which underlies the effect on cooperation for both friends and strangers. We tested this prediction in Study 3 by comparing cooperation among pairs of either strangers or friends who ate from shared versus separate containers. We expected that sharing plates would similarly increase cooperation for friends (who are close) and strangers (who are not close). Specifically, we predicted a serial mediation: (a) Sharing plates increases the experience of coordination when eating, (b) the experience of coordination when eating increases the experience of coordination when subsequently negotiating, and (c) the experience of coordination while negotiating improves negotiation performance.

Method

Participants. We predetermined a sample size of 240 using the effect size from our main measure of cooperation (strike days) from Study S1 ($\eta_p^2 = .07$, $\alpha = .05$, power = 80%). We collected data from 240 undergraduate students, graduate students, and staff (115 female; age: M = 23.23 years, SD = 7.50). Participants received $3 for participating and a chance to earn a $50 Amazon gift card on the basis of their study performance.

Procedure. The study employed a 2 (consumption: shared vs. separate) × 2 (negotiation role: union vs. management) × 2 (relationship: friends vs. strangers) between-subjects design. Research assistants approached participants on campus to take part in a study that was supposedly on how hunger impacts decisions. Friends were pairs of individuals already sitting together, and strangers were individuals recruited separately who did not know one another.

Participants first completed the eating manipulation for shared versus separate plates from Study 2. We videotaped participants as they were eating (for examples of videos, see https://osf.io/x8sv6/ to confirm that sharing plates increased actual coordination.

Next, a research assistant randomly assigned participants to negotiation roles (union or management) and verbally explained the negotiation procedure from Study 1. Participants learned that their goal was to settle on an hourly wage between $10 and $11 within 22 rounds, with a strike set to initiate if a deal were not reached by Round 2. Participants learned that they would enter a lottery for a $50 Amazon gift card on the basis of their performance in the negotiation (i.e., higher scores would award them more entries into the lottery).

After participants reached an agreement on a wage (or after 20 strike days), the negotiation ended. We collected two measures of coordination: (a) "When you were eating the Goldfish snack, how coordinated did you feel you were with your partner?" (consumption coordination) and (b) "When you were bidding over an hourly wage, how coordinated did you feel you were with your partner?" (negotiation coordination; 1 = *not at all coordinated*, 7 = *very coordinated*).

Finally, to confirm that we partnered pairs of friends and pairs of strangers, we asked two questions assessing relationship status: "How well do you know your partner in this study?" (1 = *do not know very well*, 7 = *know very well*) and "How close are you to your partner in this study?" (1 = *we are just acquaintances*, 7 = *we are very good friends*). To maintain our cover story, we asked participants, "How hungry are you right now?" (1 = *not at all*, 7 = *very much; M* = 2.23, 95% CI = [2.02, 2.45]).

Results

We first confirmed our manipulation of friend versus stranger, collapsing the two items measuring relationship status (r = .96, 95% CI = [.95, .97]). A t test of self-reported relationship status on relationship (friends vs. strangers) confirmed that friends were more connected than strangers (friends: M = 5.82, 95% CI = [5.55, 6.10]; strangers: M = 1.36, 95% CI = [1.19, 1.53]), $t(238)$ = 27.29, $p < .001$, d = 3.52, 95% CI = [3.12, 3.93].

Moving to hypothesis testing, we first analyzed our main measure of cooperation—total strike days—as a function of consumption condition (shared vs. separate) and relationship status (friends vs. strangers). As we predicted, pairs sharing food went into fewer strike days (M = 6.37, 95% CI = [4.80, 7.93]) than pairs eating from separate bags (M = 9.75, 95% CI = [8.15, 11.35]), $F(1, 116) = 8.25$, $p = .005$, $\eta_p^2 = .07$, 95% CI = [.01, .17], BF_{10} = 11.08 (see Fig. 5). There was also an effect of relationship, with friends having fewer strike days than strangers (friends: M = 6.59, 95% CI = [5.15, 8.03]; strangers: M = 9.58, 95% CI = [7.83, 11.32]), $F(1, 116) = 6.10$, $p = .015$, $\eta_p^2 = .05$, 95% CI = [.002, .14]. There was no significant Consumption Condition × Relationship interaction, $F(1, 116) = 0.26$, $p = .612$, $\eta_p^2 = .002$, 95% CI = [.000, .05]. The nonsignificant interaction implies a similar effect of shared plates on increasing cooperation for friends and strangers, as we expected.

Because our main variable of cooperation was strike days, a dyadic variable, we analyzed the next two measures (our proposed mediators)—perceived coordination when eating (r = .41, 95% CI = [.24, .58]) and perceived coordination when negotiating (r = .41, 95% CI = [.24, .56])—at the pair level (i.e., averaging the individual ratings within each dyad).

An analysis of variance (ANOVA) of perceived coordination when eating on the Consumption Condition × Relationship interaction yielded the predicted effect of consumption condition. Pairs in the shared-consumption condition perceived greater coordination than pairs in the separate-consumption condition (shared: M = 5.36, 95% CI = [5.04, 5.68]; separate: M = 4.11, 95% CI = [3.68, 4.53]), $F(1, 116) = 20.93$, $p < .001$, $\eta_p^2 = .15$, 95% CI = [.05, .27], BF_{10} = 2,457.48. There was also a main effect of relationship; pairs of friends perceived greater consumption coordination than did pairs of strangers (friends: M = 5.10, 95% CI = [4.69, 5.50]; strangers: M = 4.36, 95% CI = [3.97, 4.74]), $F(1, 116) = 6.03$, $p = .016$, $\eta_p^2 = .05$, 95% CI = [.002, .14], and there was no significant Consumption Condition × Relationship interaction, $F(1, 116) = .05$, $p = .824$, $\eta_p^2 < .001$, 95% CI = [.00, .02].

An ANOVA of perceived negotiation coordination on the Consumption Condition × Relationship interaction yielded a predicted yet marginal effect of consumption condition. Pairs in the shared-consumption condition perceived marginally greater coordination during the negotiation than did pairs in the separate-consumption condition (shared: M = 4.71, 95% CI = [4.37, 5.05]; separate: M = 4.28, 95% CI = [3.94, 4.61]), $F(1, 116) = 2.81$, $p = .096$, $\eta_p^2 = .02$, 95% CI = [.00, .10]. Further, there

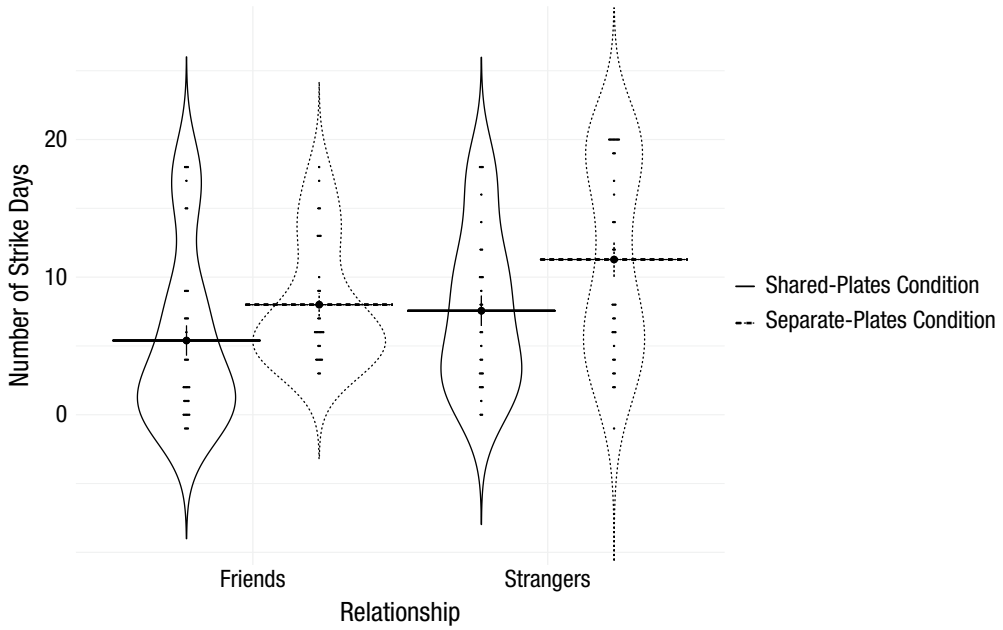

Fig. 5. Number of strike days (range = −1 to 20) as a function of relationship, separately for pairs who shared plates and who ate from separate plates (Study 3). Fewer strike days indicate greater cooperation. Violin plots indicate the distribution of strike days (with dots for individual pairs). Horizontal lines indicate means for each combination of consumption condition and relationship, and error bars indicate standard errors.

was no significant effect of relationship, $F(1, 116) = 1.75$, $p = .188$, $\eta_p^2 = .01$, 95% CI = [.00, .08], or significant Consumption Condition × Relationship interaction, $F(1, 116) = 1.54$, $p = .218$, $\eta_p^2 = .01$, 95% CI = [.00, .08].

We next tested for serial mediation and found that (a) shared consumption increased coordination when eating, (b) coordination when eating increased coordination when negotiating, and (c) coordination when negotiating reduced number of strike days, collapsing across relationship status (see Fig. 6; PROCESS Model 6; Hayes, 2013). Specifically, consumption condition had a significant, positive effect on consumption coordination, which had a significant, positive effect on negotiation coordination, which reduced strike days ($\beta = -0.33$, $SE = 0.15$, 95% CI = [−0.71, −0.10]). This suggests that sharing plates increased perceptions of coordination when eating, which increased perceptions of coordination when negotiating, leading to reduced strike days.

We also analyzed our secondary measure of cooperation—negotiation-performance outcome scores—using a mixed-model analysis with consumption condition, relationship, and role as fixed factors and pair as a random factor. As we predicted, we found a main effect of consumption condition; participants in the shared-consumption condition performed better than those in the separate-consumption condition, $F(1, 116) = 5.69$, $p = .019$, $\eta_p^2 = .05$, 95% CI = [.001, .14]. There was a main effect of relationship, with friends performing better than strangers, $F(1, 116) = 6.69$, $p = .011$, $\eta_p^2 = .05$, 95% CI = [.003, .15], and no significant Consumption Condition × Relationship interaction, $F(1, 116) = 1.75$, $p = .189$, $\eta_p^2 = .01$, 95% CI = [.00, .08]. As in Study 1, there was a main effect of role; union received higher scores than management, which was a feature of this exercise, $F(1, 116) = 888.98$, $p < .001$, $\eta_p^2 = .88$, 95% CI = [.85, .91], and there was no significant Consumption Condition × Role interaction, $F(1, 116) = 1.10$, $p = .298$, $\eta_p^2 = .009$, 95% CI = [.00, .07].

Recall that we also assessed coordination directly by recording participants as they ate. As we expected, in the shared-consumption condition, 66.7% of participants physically handed the bag of food to their partner at least once, and 88.3% actively waited for their partner to take food before reaching for food themselves (i.e., had their hand poised in the air to take food). To find further evidence for coordination, we calculated the percentage of time that both members in a dyad spent eating during the eating period. Specifically, given that dyads always started to eat at the same time, we recorded the time at which each member finished eating and divided the faster member's total eating time by the slower member's total eating time to calculate a percentage of simultaneous eating for the pair. Confirming participants' subjective reports of cooperation, results showed that pairs who shared plates ate simultaneously during 92.12% of their eating period (95% CI = [88.60%,

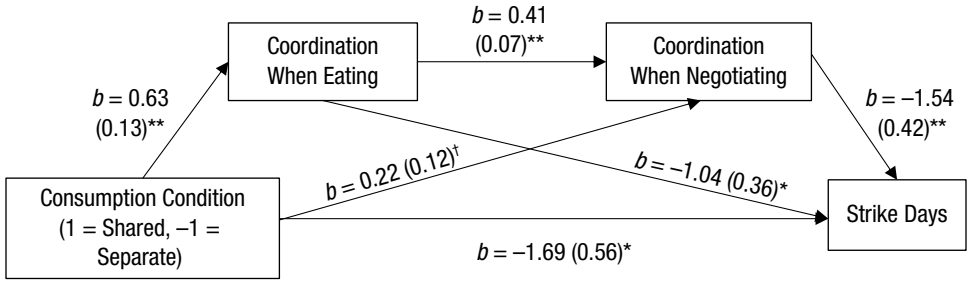

Fig. 6. Schematic showing results from a serial multiple mediation of consumption condition on reduced strike days through perceived coordination when eating and when negotiating (Study 3). Standard errors are given in parentheses. Asterisks indicate significant paths ($^{\dagger}p < .10$, $^{*}p < .01$, $^{**}p < .001$).

95.64%]; i.e., during 7.88% of this period, only the slower-to-finish person ate), which was greater than pairs in the separate-consumption condition, who ate simultaneously during 81.57% of their eating period (95% CI = [76.32%, 86.82%]; i.e., during 18.43% of this period, only the slower-to-finish person ate), $t(118) = 3.34$, $p = .001$, $d = 0.61$, 95% CI = [0.24, 0.97].

Meta-Analyses

To examine the overall effect of shared (vs. separate) consumption on cooperation, we conducted an internal meta-analysis on the three studies reported here and five additional studies in the Supplemental Material, which includes all the studies we ran to test our hypothesis, using the R package *metafor* (Viechtbauer, 2010; see Table S2 in the Supplemental Material). We computed Cohen's *d* and the variance of *d* for continuous outcome variables (Studies 1–3; Studies S1, S2, and S5) and dichotomous outcome variables (Studies S3 and S4) on the basis of work by Borenstein, Hedges, Higgins, and Rothstein (2011, pp. 28, 47).

A random-effects model resulted in a significant point estimate, $d = 0.51$, $SE = 0.10$, 95% CI = [0.30, 0.72], $z = 4.86$, $p < .0001$, $Q(7) = 18.16$, $p = .011$, suggesting a medium-sized effect (Cohen, 1992). We thus found converging evidence across these eight studies that sharing plates increased cooperation (see Fig. 7). We

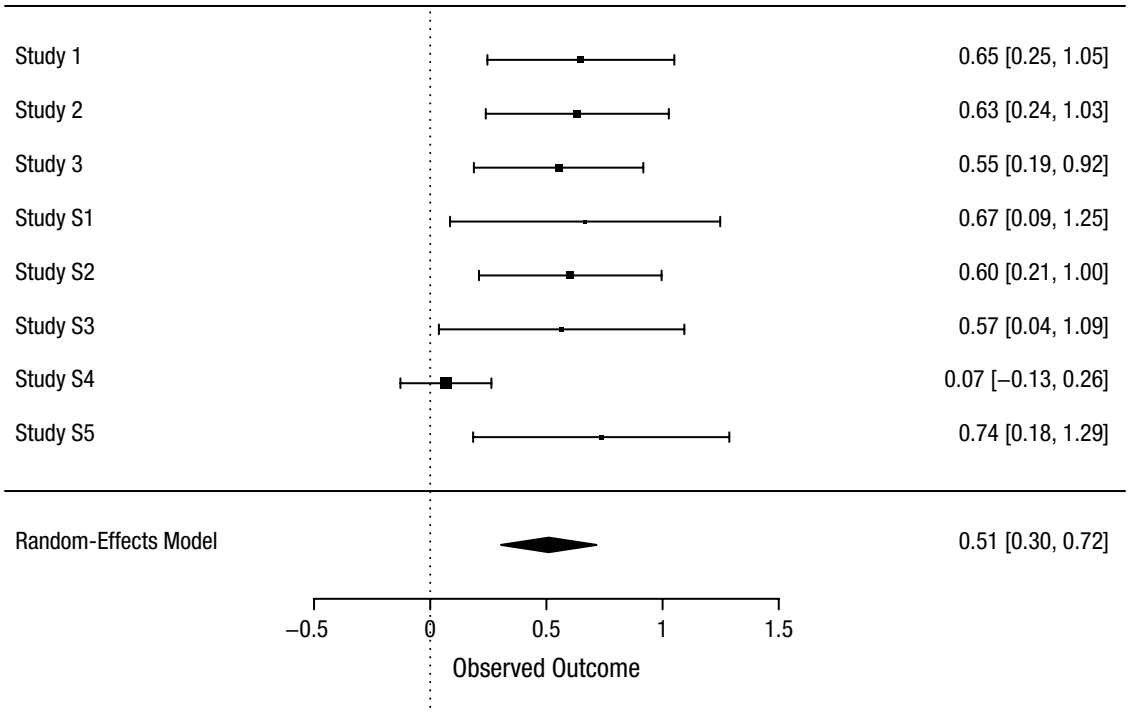

Fig. 7. Forest plot for the meta-analysis on the effect of shared (vs. separate) consumption on cooperation for Studies 1 to 3 as well as Studies S1 to S5 in the Supplemental Material available online. Squares show effect-size estimates (Cohen's *d*s). The size of each square gives a representation of each study's sample size. Error bars show 95% confidence intervals (CIs). The diamond represents the point estimate and 95% CI averaged across studies.

note, however, that the measure of inconsistency across studies is moderate, I^2 = 53.79% (Higgins & Green, 2011). Running the meta-analysis without Study S4, which unlike the other studies was conducted on a non-American sample, resulted in an effect size (d) of 0.62 (SE = 0.08, 95% CI = [0.45, 0.78], z = 7.33, $p < .0001$), with no significant heterogeneity, $Q(6)$ = 0.40, $p = .999$, $I^2 = 0$.

General Discussion

Across our studies, we consistently found that eating style influenced behavior toward a potential rival, leading individuals who shared plates to be more cooperative. Specifically, eating food served centrally, from one plate, improved coordination, which positively predicted cooperation for both friends and strangers.

Of course, sharing food is not the only type of coordination behavior that can foster cooperation. However, studying the psychology behind sharing plates is useful because it is an activity that people engage in daily—often with strangers—and that is rooted in almost every culture. Whereas previous research examined the benefits of shared attention on increasing cooperation (Shteynberg, 2015), we found effects of eating style above and beyond shared attention, as all pairs in our studies ate the same food and performed the same tasks.

Although sharing plates is not uncommon in the United States, the tendency to eat from a shared plate is most prevalent in Asian countries. One possibility is that greater cooperation in Asian cultures is related to the shared style of eating. That is, people from more collectivist, Asian cultures have been found to be more cooperative than people from individualistic, Western cultures, who focus mainly on their own outcomes and less on the welfare of others (Hemesath & Pomponio, 1998; Kagan & Knight, 1979; McClintock, 1974; Parks & Vu, 1994; Probst, Carnevale, & Triandis, 1999). Potentially, people who always coordinate their food consumption with others learned to cooperate as a result. Of course, the opposite causal direction is also possible—that cultures that were naturally more cooperative developed food practices that involved more coordination. This latter direction, from cooperation to style of serving food, is consistent with the observation that family-style meals, which bring together people who are already well coordinated, involve shared, central platters. Given this analysis, it is possible that the effect of shared plates would have a greater influence on people from individualistic cultures who are less accustomed to this shared style of eating.

A remaining question is whether directing people's attention to the effect of shared plates on improving interactions with strangers would lead them to prefer sharing food. To answer this, we had each of 101 Amazon Mechanical Turk workers (44 female; age: M = 32.43 years, SD = 10.89) read about one of two negotiations. Negotiators were first required to eat chips and salsa from either the same bowl or separate bowls. We asked, "How likely do you think it is that these strangers cooperated in their negotiation to settle on an outcome?" (−3 = *less likely to cooperate*, 3 = *more likely to cooperate*). We found that people expected strangers consuming from the same bowl to be more likely to cooperate than strangers consuming from separate bowls (shared: M = 1.72, 95% CI = [1.44, 2.00]; separate: M = 0.55, 95% CI = [0.16, 0.94]), $t(99) = 4.94$, $p < .001$, d = 0.98, 95% CI = [0.56, 1.39]. Hence, when we directed people's attention to the shared plates (which we did not do in our studies), they recognized that it facilitates cooperation. Despite this, the majority of participants (73.3%, $z = 4.58$, $p < .001$, 95% CI = [63.5%, 81.6%]) still preferred to eat from separate plates. It appears that although people can recognize that sharing plates with a stranger improves cooperation (when their attention is explicitly directed to it), most people are reluctant to implement this behavior themselves or may even resist putting themselves in a cooperative mind-set, expecting (often falsely) to perform better if they compete instead of cooperate.

An additional question pertains to the role of demand characteristics and experimenter expectancy effects on the observed results (Gilder & Heerey, 2018). Our studies with actual food consumption (i.e., those reported here vs. those reported in the Supplemental Material) involved experimenters not blind to condition when interacting with participants, which possibly contributed to the effect of consumption. To limit this concern, we ensured that experimenters were blind to the hypothesis, and we suggest that future research further minimize the role of experimenters or use double-blind procedures to limit experimenter beliefs as an artifact, where possible.

Finally, we anticipate that some styles of shared-plate eating are more likely to require coordination, and therefore lead to improved cooperation, than other styles. Meals that require sharing plates, such as Asian or tapas style, in which portions are selected from a central bowl, require coordination to consume and share. And more involved meals, requiring coordination over multiple plates, are likely to intensify the effect. However, when the quantity of food being shared is large, such as buffet-style meals, coordination is less likely to occur because the resource is unlimited; people may take as much as they want and do not need to think about whether there will be food for the next person. Similarly, less coordination is required when

there is a clear portion being divided, such as eating a single slice of cake. Finally, if the quantity of food is very small, sharing plates may induce competition by highlighting food scarcity (Herr, 1986; Neuberg, 1988), and again, sharing is unlikely to activate coordination and cooperation.

Overall, we provided empirical support that eating style influences cooperation. We found that eating from shared plates requires coordination, leading people to cooperate more with their food-consumption partner than when eating from individual plates. This increase in cooperation occurred among friends and strangers, suggesting that it does not require interaction partners to feel closer. These results suggest that to increase cooperation, one should serve food from shared plates (e.g., family style) rather than from individual plates.

Action Editor

D. Stephen Lindsay served as action editor for this article.

Author Contributions

Both authors developed the study concept and design. K. Woolley supervised the data collection by research assistants and analyzed the data. Both authors wrote the manuscript and approved the final manuscript for submission.

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Declaration of Conflicting Interests

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

Supplemental Material

Additional supporting information can be found at http://journals.sagepub.com/doi/suppl/10.1177/0956797619830633

Open Practices

All data and materials have been made publicly available via the Open Science Framework and can be accessed at osf.io/7tssz. The design and analysis for the studies were preregistered: https://osf.io/av6yj/ (Study 1), https://osf.io/cbu9d (Study 2), https://osf.io/4t4tm (Study 3). The complete Open Practices Disclosure for this article can be found at http://journals.sagepub.com/doi/suppl/10.1177/0956797619830633. This article has received the badges for Open Data, Open Materials, and Preregistration. More information about the Open Practices badges can be found at http://www.psychologicalscience.org/publications/badges.

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