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

Kaitlin Woolley[1] & Ayelet Fishbach[2]

[1]*Cornell University*; [2]*University of Chicago*

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The raw data and supplemental material for all studies are available at OSF: bit.ly/2nxqNXu

Corresponding Author:
Kaitlin Woolley
Cornell University
322 Sage Hall
Ithaca, NY 14853-6201
E-mail: krw67@cornell.edu

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* = 1476) yielded evidence that it does. People eating from shared plates (i.e., 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 not only allies, but strangers as well.

Keywords: food consumption, cooperation, coordination, social dilemma, negotiation

Cultures around the world vary not only by their food traditions, but also by how food is served at the table and subsequently, shared 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 everyone receives a fair share. Alternatively, in a French-style meal, diners are served individual plates of food, which could require less coordination with others 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 argues 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 those who consume similar foods to them (Fawcett & Markson, 2010; Liberman, Woodward, Sullivan, & Kinzler, 2016; Woolley & Fishbach, 2017). However, moving beyond getting together and eating similar foods, we ask whether sharing a plate with another person, and the required coordination that follows, influences social interactions.

On the one hand, sharing food with others 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 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 et al., 2014). On the other hand, sharing food involves coordination: diners should attend to other diners' needs–whether and how much others served themselves, as well as others' movements, as diners wait their turn to reach for the common source of food.

In a typical shared-plate meal, because coordination over allocation of resources is a more frequent experience than competition over scarce food, we predicted that shared plates would increase cooperative behavior among people. Coordination requires sharing another person's perspective—taking their 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 food portion 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 like 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 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 versus 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 those who share plates feel more socially connected. Whereas those 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 leads people to feel more socially connected, or that shared plates only increase cooperation between 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. As such, we predicted that shared plates 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 in R. We conducted a meta-analysis synthesizing the main results from eight studies (three main studies reported here and five additional studies in the supplements), including three pre-registered studies, d = .51, SE = .10, 95% CI = [.30, .72], z = 4.86, p < .0001. Raw data and supplements for all studies available at OSF (bit.ly/2nxqNXu).

Study 1: Shared Plates Increase Cooperation in a Negotiation

Study 1, preregistered at bit.ly/2MUgQgi, examined whether eating food from a shared plate increases cooperation between two individuals compared with eating food from individual plates. 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 (management wanted a low wage, union wanted a high one) 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 collected data from 200 undergraduate and graduate students outside a campus cafe (107 females; M_{age} = 23.57, SD = 8.80). We originally ran a similar study with a smaller sample (Study 1 in supplements) and the current study's (larger) sample size was calculated from the effect size observed in a meta-analysis of Studies 2-3 and Supplemental Studies 1-3 and 5, d = .61. A sample size of 200 allowed us to detect an effect of d = .61 with 85% power at alpha = .05. Participants received a $3 Amazon gift card for participating and a chance to win $50 based on 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 condition. In the separate-consumption condition, there were two 20g tortilla chip bowls and two 25g salsa bowls. In the shared-consumption condition, there was one 40g tortilla chip bowl and one 50g 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 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 (electronic pdf on an iPad), which the research assistant read aloud, detailing the negotiation procedure.

Specifically, participants learned they would be negotiating an hourly wage rate during a strike period and that they would enter a lottery for a $50 Amazon gift card based on their performance in the negotiation (i.e., higher scores corresponded to more entries into the lottery). Within each pair, they were randomly assigned to either the role of union or management and learned their 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 the union wanted a higher wage for themselves (maximum set at $11), whereas the 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 the 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 minus two; range: -1 to 20). As a secondary measure of cooperation, we calculated performance outcome scores for each player, which were a function of the wage rate agreed upon and the total number of strike days. In this negotiation simulation, the payoff structure was such that minimizing strike days (i.e., rounds) was equally 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. *Union-management negotiation: cost of each day of strike.*

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

We calculated the performance outcome scores for management based on 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 (i.e., $0.50 = 50). We calculated the performance outcome scores for the union based on 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 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/cost to each party would be: Management: -$2,500,000 - $1,760,000 [cost of 8-day strike]) = - $4.26MM; Union: $2,000,000 - $720,000 (cost of 8-day strike) = $1.28MM. Performance outcome scores were consequential, as higher scores corresponded to more entries into the $50 lottery.

Once participants reached an agreement on a wage (or after 20 strike days), the negotiation ended. We pre-registered that we only planned to recruit strangers in our sample and confirmed that we successfully partnered strangers by measuring relationship status (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 = .15, SD = .53).

Results

As pre-registered, we analyzed the effect of condition on total strike days using a t-test analysis. If shared food consumption increased cooperation, this should lead to a faster resolution of the negotiation. As 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]), $t(98) = 3.24$, $p = .002$, $d = .65$, 95% $CI_{\text{effect size}}$ = [.24, 1.05], $BF_{10} = 19.50$ (Figure 1).

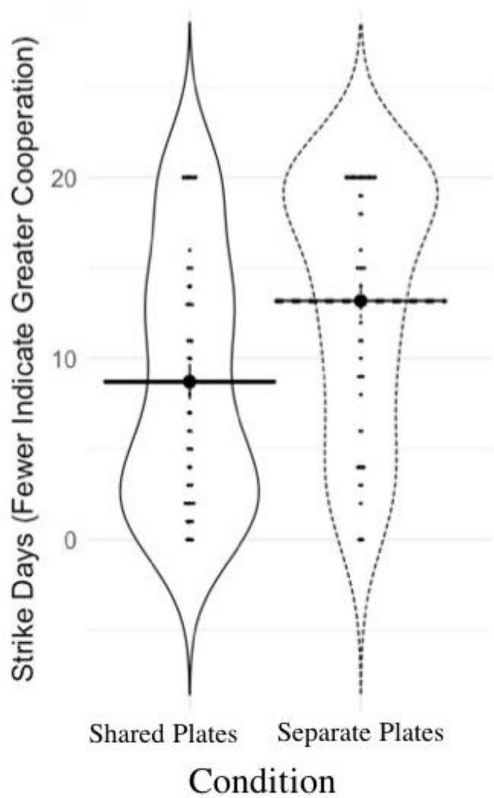

Figure 1. Sharing plates reduced number of strike days (range: -1 to 20) in a wage negotiation compared with eating from separate plates (Study 1). Violin plots indicate the distribution of strike days (with dots for individual participants). Horizontal lines indicate means as a function of condition.

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 condition and role as fixed factors and pair as a random factor. As 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 (M_{shared} = -$2.16MM, 95% CI = [-$2.71MM, -$1.60MM]; $M_{separate}$ = -$3.46MM, 95% CI = [-$4.01MM, -2.90MM]), $F(1, 98) = 10.81$, $p = .001$, $\eta_p^2 = .10$, 95% $CI_{effect\ size}$ = [.02, .22] (Figure 2). There was 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% $CI_{effect\ size}$ = [.89, .93]. There was also an unpredicted significant interaction, $F(1, 98) = 5.99$, $p = .016$, $\eta_p^2 = .06$, 95% $CI_{effect\ size}$ = [.002, .16], such that the effect of shared plates was stronger for management (M_{shared} = -$5.41MM, 95% CI =[-$6.20MM, -$4.62MM]; $M_{separate}$ = -$7.24MM, 95% CI = [-$7.98MM, -$6.49MM], $t(98) = 3.39$, $p = .001$, $d = .68$, 95% $CI_{effect\ size}$ = [.27, 1.08], than for union (M_{shared} = $1.10MM, 95% CI =[$0.66MM, $1.54MM]; $M_{separate}$ = $0.32MM, 95% CI = [-$0.20MM, $0.85MM]), $t(98) = 2.30$, $p = .024$, $d = .46$, 95% $CI_{effect\ size}$ = [.06, .86]. Levene's test for equality of variances was not significant (cost to management: $F = .003$, $p = .957$; cost to union: $F = 2.98$, $p = .087$) and equal variances are assumed. The pattern of results remains unchanged if equal variances are not assumed (management: $t(97.69) = 3.39$, $p = .001$, $d = .68$, 95% $CI_{effect\ size}$ = [.27, 1.08]; union $t(94.78) = 2.30$, $p = .024$, $d = .46$, 95% $CI_{effect\ size}$ = [.06, .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.

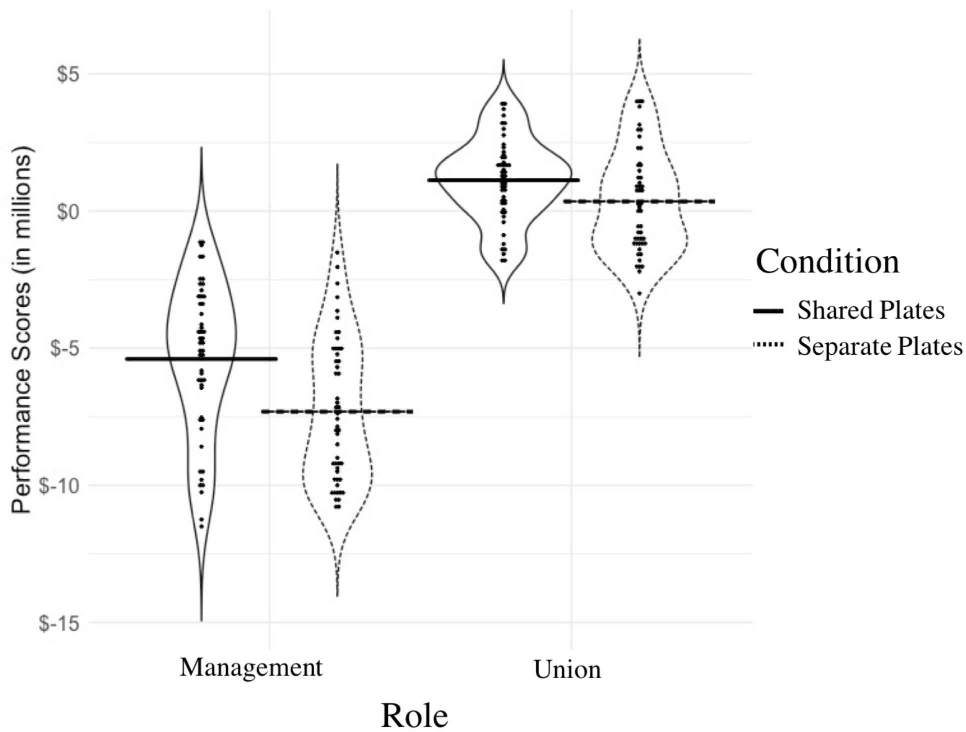

Figure 2. Sharing plates improved negotiation performance outcome scores compared with eating from separate plates in Study 1. Violin plots indicate the distribution of performance outcome scores (with dots for individual participants). Horizontal lines indicate means as a function of consumption condition and role.

Study 2: Shared Plates Increase 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 based on a medium-large effect size (f = .33), and collected data from 104 undergraduate and graduate students outside a campus cafe (56 females; M_{age} = 20.45, SD = 3.16; 4 participants failed to complete demographic questions). Participants received $5 and had a chance to earn $50 based on their study performance.

Procedure. The study employed a 2 (consumption: shared vs. separate) between-subjects design. A research assistant approached participants to take part in a study, supposedly on how hunger impacts decisions. Participants received goldfish crackers to eat before they completed a 20-round version of a 2-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 (24g of crackers) and in the separate-consumption condition, each person in the pair received their own Ziploc bag (12g of crackers). Participants finished their food before receiving instructions about the airline-pricing game.

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

	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**

Figure 3. Payoff matrix for iterated Prisoner's Dilemma game provided to participants (Study 2).

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 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.

Our theory predicts that shared-plates increase cooperation without increasing closeness. Alternatively, shared plates increase cooperation by increasing interpersonal closeness. To test for this alternative, after the game ended, participants rated experienced closeness to their partner: (1) “To what extent does your partner seem likable?” (2) “To what extent does it seem you could get along with this person in the future?” (3) “Could you see yourself becoming close to this person?” and (4) “Could you see yourself becoming friends with this person?” (0 = *not at all*, 6 = *very much*). In order to confirm consumption was not aversive to participants, we also asked about snack enjoyment (1) “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 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% $CI_{\text{effect size}}$ = [.002, .27], $BF_{10} = 3.73$ (Figure 4).

We collapsed the four items measuring closeness (α = .89) and found a nonsignificant effect of consumption, $F(1, 48) = .90$, $p = .347$, $\eta_p^2 = .02$, 95% $CI_{\text{effect size}}$ = [.00, .15], consistent with our theory that shared consumption increases cooperation among strangers and, does not rely on a corresponding increase in interpersonal closeness. To test for a null effect of shared (vs. separate) plates on closeness, we report $BF_{10} = 0.40$ to provide evidence in favor of the alternative model ($BF_{10} > 1$) and $BF_{01} = 2.53$ to provide evidence in favor of the null model ($BF_{01} > 1$), which revealed anecdotal evidence that shared consumption did not significantly increase closeness (Jeffreys, 1961).

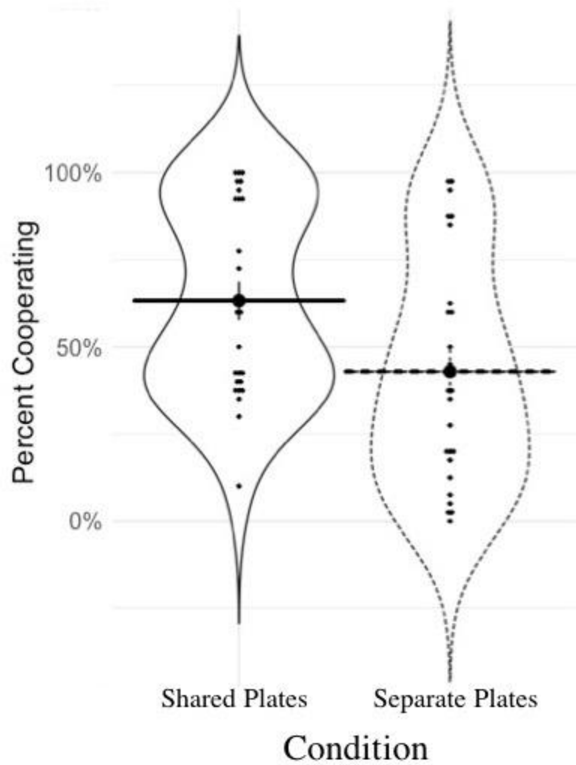

Figure 4. Sharing plates increased individuals' rate of cooperation compared with eating from separate plates (Study 2). Violin plots indicate the distribution of cooperation rates (with dots for individual participants). Horizontal lines indicate means as a function of condition.

Study 3: Shared Plates Increase Cooperation in a Negotiation for 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, (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 supplemental Study 1 (η_p^2 = .07, alpha = .05, power = 80%). We collected data from 240 undergraduate students, graduate students, and staff (115 females; M_{age} = 23.23, *SD* = 7.50). Participants received $3 for participating and a chance to earn a $50 Amazon gift card, based on 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, 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 (link to examples of videos: bit.ly/2w1MFPO) to confirm that sharing plates increased actual coordination.

Next, a research assistant randomly assigned participants to negotiation role (union vs. management) and verbally explained to participants the negotiation procedure from Study 1. Participants learned 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 based on their performance in the negotiation (i.e., higher scores would award them more entries into the lottery).

Once participants reached an agreement on a wage (or after 20 strike days), the negotiation ended. We collected two measures of coordination: 1. Consumption-coordination: "When you were eating the Goldfish snack, how coordinated did you feel you were with your partner?" and 2. Negotiation-coordination: "When you were bidding over an hourly wage, how coordinated did you feel you were with your partner?" (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*). As part of our cover story, participants answered "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 friends were more connected than strangers (M_{friends} = 5.82, 95% CI = [5.55, 6.10]; $M_{\text{strangers}}$ = 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 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% $\text{CI}_{\text{effect size}}$ = [.01, .17], BF_{10} = 11.08 (Figure 5). There was also an effect of relationship, with friends having fewer strike days than strangers (M_{friends} = 6.59, 95% CI = [5.15, 8.03]; $M_{\text{strangers}}$ = 9.58, 95% CI = [7.83, 11.32]), $F(1, 116) = 6.10$, $p = .015$, $\eta_p^2 = .05$, 95% $\text{CI}_{\text{effect size}}$ = [.002, .14], with no significant interaction, $F(1, 116) = .26$, $p = .612$, $\eta_p^2 = .002$, 95% $\text{CI}_{\text{effect size}}$ = [.000, .05]. The nonsignificant interaction implies a similar effect of shared plates on increasing cooperation for friends and strangers, as we expected.

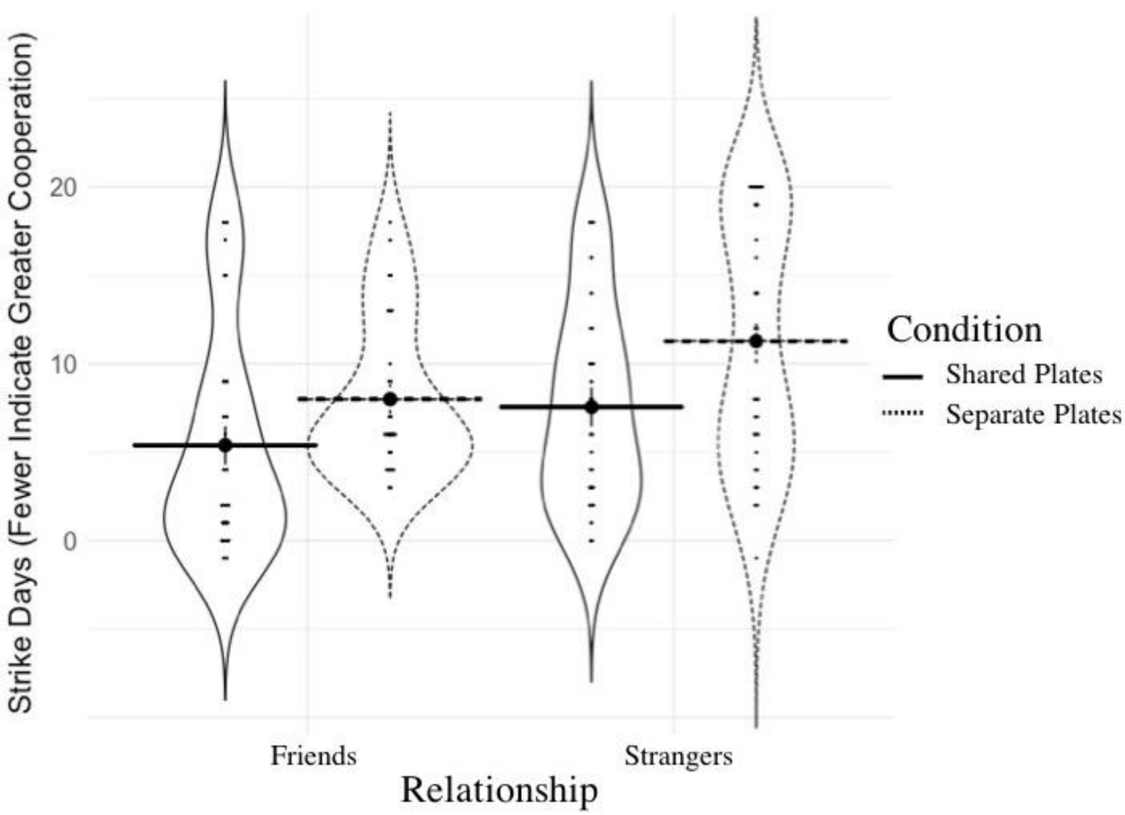

Figure 5. Friends as well as strangers cooperated more (fewer strike days; range: -1 to 20) after first consuming food from shared (vs. separate) plates with their partner (Study 3). Violin plots indicate the distribution of strike days (with dots for individual pairs). Horizontal lines indicate means as a function of consumption condition and relationship.

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 as well (i.e., averaging the individual ratings within each dyad).

An ANOVA of perceived coordination when eating on consumption condition × relationship yielded the predicted effect on consumption condition. Pairs in the shared-consumption condition perceived greater coordination than pairs in the separate-consumption condition (M_{shared} = 5.36, 95% CI = [5.04, 5.68]; $M_{separate}$ = 4.11, 95% CI = [3.68, 4.53]), F(1, 116) = 20.93, p < .001, η_p^2 = .15, 95% $CI_{effect\ size}$ = [.05, .27], BF_{10} = 2457.48. There was also a main effect of relationship; pairs of friends perceived greater consumption-coordination than pairs of strangers ($M_{friends}$ = 5.10, 95% CI = [4.69, 5.50]; $M_{strangers}$ = 4.36, 95% CI = [3.97, 4.74]), F(1, 116) = 6.03, p = .016, η_p^2 = .05, 95% $CI_{effect\ size}$ = [.002, .14], with no significant interaction, F(1, 116) = .05, p = .824, η_p^2 < .001, 95% $CI_{effect\ size}$ = [.00, .02].

An ANOVA of perceived negotiation-coordination on consumption condition × relationship yielded a predicted, though marginal effect of consumption condition. Pairs in the shared-consumption condition perceived marginally greater coordination during the negotiation than pairs in the separate-consumption condition (M_{shared} = 4.71, 95% CI = [4.37, 5.05]; $M_{separate}$ = 4.28, 95% CI = [3.94, 4.61]), F(1, 116) = 2.81, p = .096, η_p^2 = .02, 95% $CI_{effect\ size}$ = [.00, .10], with no significant effect of relationship, F(1, 116) = 1.75, p = .188, η_p^2 = .01, 95% $CI_{effect\ size}$ = [.00, .08], or significant interaction, F(1, 116) = 1.54, p = .218, η_p^2 = .01, 95% $CI_{effect\ size}$ = [.00, .08].

We next tested for serial mediation, finding 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 (Figure 6; PROCESS Model 6, Hayes, 2012). Specifically, consumption condition had a significant, positive effect on consumption-coordination, which had a significant, positive effect on negotiation-coordination, which reduced strike days (β = -.33, SE = .15, 95% CI = [-.71, -.10]). This suggests that sharing plates increased perceptions of coordination when eating, which increased perceptions of coordination when negotiating, leading to reduced strike days.

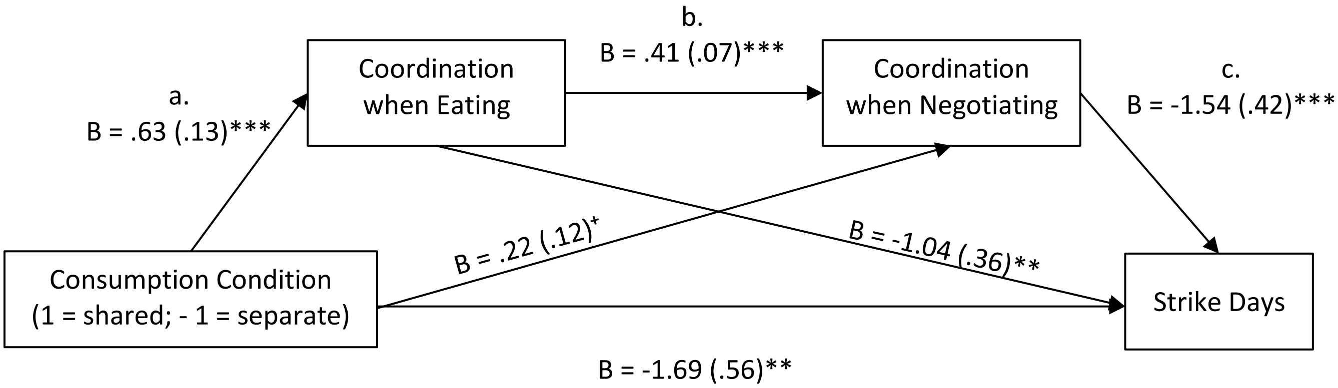

Figure 6. A serial multiple mediation of consumption condition (1 = shared; -1 = separate) on reduced strike days through perceived coordination when eating and negotiating. Parentheses indicate *SE*; $^{+} p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

We also analyzed our secondary measure of cooperation—negotiation performance outcome scores— using a mixed model analysis with condition, relationship, and role as fixed factors and pair as a random factor. As 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% $CI_{\text{effect size}}$ = [.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% $CI_{\text{effect size}}$ = [.003, .15], and no significant condition × relationship interaction, $F(1, 116) = 1.75$, $p = .189$, $\eta_p^2 = .01$, 95% $CI_{\text{effect size}}$ = [.00, .08]. As in Study 1, there was a main effect of role; union received higher scores than managers, which was a feature of this exercise, $F(1, 116) = 888.98$, $p < .001$, $\eta_p^2 = .88$, 95% $CI_{\text{effect size}}$ = [.85, .91], and no significant condition × role interaction, $F(1, 116) = 1.10$, $p = .298$, $\eta_p^2 = .009$, 95% $CI_{\text{effect size}}$ = [.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). As further evidence for coordination, we calculated the proportion of time both members in a dyad ate during the eating period. Specifically, given that dyads always started to eat at the same time, we recorded the time each member finished eating, and divided the faster member's total eating time by the slower member's total eating time to calculate a proportion of simultaneous eating for the pair. Confirming participants' subjective reports of cooperation, pairs who shared plates ate simultaneously during 92.12% of their eating period (95% CI = [88.60%, 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 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), $t(118) = 3.34$, $p = .001$, $d = .61$, 95% $CI_{\text{effect size}}$ = [.24, .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 Supplemental Studies (in Supplemental Material), which comprises all the studies we ran to test our hypothesis, using the R package metafor (Viechtbauer, 2010) (see Table S2 in supplemental material). We computed Cohen's *d* and the variance of *d* for continuous (Studies 1-3; Supplemental Studies 1-2 and 5) and dichotomous outcome variables (Supplemental Studies 3-4) based on Borenstein et al. 2011 (pp. 28, 47).

A random-effects model resulted in a significant point estimate, $d = .51$, $SE = .10$, 95% CI = [.30, .72], $z = 4.86$, $p < .0001$, $Q(7) = 18.16$, $p = .011$, suggesting a medium effect (Cohen, 1992). We thus found converging evidence across these eight studies that sharing plates increased cooperation (Figure 7). We note however that the measure of inconsistency across studies is moderate, $I^2 = 53.79\%$ (Green & Higgins, 2005). Running the meta-analysis removing Supplemental Study 4, which unlike the other studies was conducted on a non-American sample, resulted in an effect of $d = .62$, $SE = .08$, 95% CI = [.45, .78], $z = 7.33$, $p < .0001$, with no significant heterogeneity, $Q(6) = .40$, $p = .999$, $I^2 = 0$.

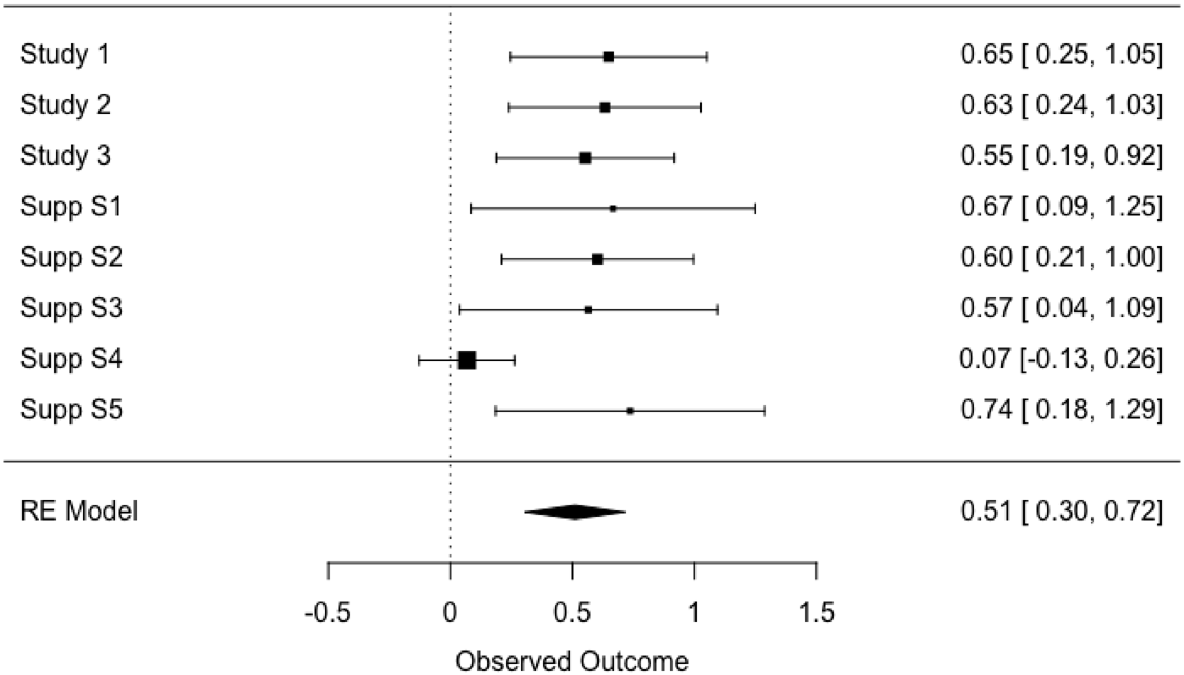

Figure 7. Forest plot for meta-analysis of effect of shared (vs. separate) consumption on cooperation for Studies 1-3 and Supplemental Studies 1-5.

General Discussion

Across our studies, we consistently found that eating style influenced behavior toward a potential rival, leading those who shared plates to be more cooperative. Specifically, eating food served centrally, off 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 people engage in that can foster cooperation. However, studying the psychology of sharing plates is useful because it is an activity that people engage in daily, often with strangers and which 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 shared plates are 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, those from more collectivist, Asian cultures, have been found to be more cooperative than those from individualistic, Western cultures, who focus mainly on their own outcomes and less on others' welfare (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, use shared, central platters. Based on this analysis, it is possible that the effect of shared plates would have a greater influence on those 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, 101 MTurk workers (44 female; $M_{age} = 32.43$, $SD = 10.89$) 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 ($M_{shared} = 1.72$, 95% CI = [1.44, 2.00]; $M_{separate} = .55$, 95% CI = [.16, .94]), $t(99) = 4.94$, $p < .001$, $d = .98$, 95% $CI_{effect\ size}$ = [.56, 1.39]. Hence, when we directed people's attention to the shared plates (which we did not do in our studies), they recognized 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 sharing plates with a stranger improves cooperation (when explicitly directing their attention to it), most are reluctant to implement this behavior themselves, or may even resist putting themselves in a cooperative mindset, 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 experiments with actual food consumption (i.e., those reported here vs. in supplements) involved experimenters not blind to condition when interreacting with participants, which possibly contributed to the effect of consumption. To limit this concern, we ensured experimenters were blind to hypothesis, and suggest future research further minimize the role of experimenters or use double-blind procedures to limit experimenter beliefs as an artifact where possible.

As a final note, we anticipate that some styles of shared-plate eating are more likely to require coordination, and therefore lead to improved cooperation, than others. Meals that require sharing plates, such as Asian or tapas style, where 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 who comes. 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 provide empirical support that eating style influences cooperation. We found 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 is does not require interaction partners to feel closer. These results suggest that to increase cooperation, serve food from shared plates (e.g., family style) rather than from individual plates.

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