Commensality constitutes communalism:

Producing emergent bonds in experimental small groups by sharing food and drink[1]

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Abstract

Relational Models Theory provides an alternative framework to study group and intergroup processes. One of four models people use to constitute groups is communal sharing (CS). Ethnographic and experimental evidence suggests that CS is produced by concrete and symbolic enactments of connections between bodies (cuddling, touching, synchronicity, commensality). We tested the effect of commensality on CS and ingroup favouritism in four Experiments with 3-person groups (total $n = 330$) and found that commensality enhances emergent group communal sharing but does not enhance ingroup favouritism. In Experiment 1, sharing food enhanced ingroup communal sharing but in Experiment 2 this effect was not significant. In Experiments 3 and 4, sharing water enhanced communal sharing, but only when served from the same bottle, implying consubstantial assimilation. Ingroup favouritism was not enhanced by commensality in any experiment, even when explicitly presented as exclusively ingroup (Experiment 2), suggesting non-comparative group formation through ingroup commensality.

Keywords: commensality, relational models theory, communal sharing, ingroup favouritism

Introduction

Most social psychological research on groups over the past 60 years has conceptualized the psychological bond between individuals and groups within two basic theoretical approaches. In the interdependence approach, groups are formed from positive interdependence, mutual influence, and reciprocity between individuals, from which social identity arises (Sherif, 1966; Rabbie et al., 1996; Insko et al., 1998). In the social identity approach, groups are formed from shared representations on how the social world is divided into distinct and meaningful categories of people, derived from comparison processes; based on these categorizations, people mobilize, organize themselves into groups, and interact (Tajfel, 1970; Tajfel & Turner, 1979; Turner, 1987).

Thus, these two approaches have conceptualized how groups are formed based on shared interests and shared social cognition (self-categorization), respectively. In this paper we propose that groups can also be formed based on joint activity due to people's tendency to psychologically establish relations to others when exposed to situations with relationally meaningful clues. That is, notwithstanding the importance of interdependence and social identity processes in (inter-)group dynamics, we intend to shed some light on social and psychological processes capable of producing emergent, positive forms of ingroup bonds that do not necessarily involve intergroup comparisons or expectations of ingroup reciprocity. For that purpose, we adopt the framework of Relational Models Theory (RMT; Fiske, 1991, 1992), which is based on an extensive review of ethnographic, sociological, and psychological literature, and which argues that humans have evolved as an extremely cooperative species equipped with specialized but universal systems of relational cognition and understanding. According

to this argument, complex coordination between humans is only possible because all social interactions and relations (dyadic, group, intergroup, or societal) are enactments of one or more of four basic relational models: communal sharing, authority ranking, equality matching, and market pricing.

Whereas classical approaches to group processes and intergroup relations assume that individual-level self-enhancement motives such as self-esteem or material interest mediate individual involvement in real-world group structures, RMT proposes a more general underlying motivation to engage in meaningful social relations, or sociability (Costa, 2018). In this approach, groups emerge behaviourally from diverse and complex social interactions in which people deploy each of the four models, thereby 'constituting' (i.e., proposing, producing, perceiving, and feeling) meaningful structure – including groups – in social relations.

The four relational models can thus best be defined as templates for social interaction and relations. Communal sharing structures relations and interactions as inclusion or fusion into a common social unit, in which people understand themselves as interchangeable and equivalent, feel attached to each other and share resources communally, satisfying their needs for affiliation and intimacy. Authority ranking structures relations and interactions as linear orderings of social status and respect, in which people feel they are more or less legitimately ranked, and influence and decision-making power are asymmetrical, satisfying complementary motivations for dominance and protected subordination. Equality matching structures interactions and relations as arrangements of dynamic balance between equal but separate peers, satisfying a motivation for equality, and is based on compliance to procedures such as balanced distribution of resources, voting, or turn-taking. Market pricing structures relations and

interactions according to proportionality, that is, equivalent ratios of contributions and gains/outcomes within a social field and satisfies a need for efficiency, equity, and achievement.

As a framework bridging the social and psychological sciences, the interest of relational models theory for social psychology appears self-evident. The theory has been used to address a variety of social psychological questions, such as issues of fairness, efficiency, and harmony in teams and organizations (e.g. Arendt et al., 2022; Poulson, 2005; Vodosek, 2009); morality and violence (Rai & Fiske, 2011; Rai et al., 2017); relational emotions (Simão & Seibt, 2015; Seibt et al., 2018); and political and social values (Biber et al., 2008; Simpson et al., 2015). The theory has, however, not yet been used to test how the models might be used in group formation.

Communal sharing as a form of ingroup bond

Leaving the question open whether and how each of the other relational models might be a unique basis of group formation, in the research presented in this paper we focused on communal sharing.

According to RMT, the most tightly knit social bonds are based on communal sharing (CS). Indeed, CS is used most intensely in kin groups and romantic dyads and, to a lesser extent, friendships (Brito et al., 2011; Fiske, 1991, 2004). However, it also contributes to varying degrees of cohesion in other small groups and can even underpin the plausibility of and emotional commitment to larger social groups such as ethnic communities and nations. Compared to other relational forms, CS is ontogenetically primal, appearing in the mother-infant bond, and easily recognized by infants (Thomsen, 2013) and probably also phylogenetically primal, given similar relational

structures in other species (Fiske, 1992). Because CS underpins strong social bonds, can imply a strong sense of social identity. Likewise, strong identification with a social group may enhance communal bonds withing a group. However, explicit social categorization is not necessary for CS, nor does CS refer only to strong social bonds. It can be easily introduced in emergent social relations and at low intensity by behaviours and interactions that signal and establish the use of the model (e.g., commensality with new acquaintances, courtship, hospitality toward strangers). It is also distinct from identity fusion stemming from shared traumatic or life-altering experiences (Swann et al., 2012); in contrast, CS is an innate model that people recognize in even the most trivial social interactions (Thomsen & Carey, 2013). A related concept, 'thick relations' refer to close kin or romantic relations with intense mutual obligations and intimacy (Thomas et al, 2022), probably defined by intense CS.

Finally, CS is conceptually and empirically distinct from (though often correlated with) equality matching, which is based on equality in decision-making, and distribution and use of resources, etc., and which can be identified in the egalitarian interpersonal reciprocity often assumed to underpin group formation in the interdependence approach. In CS, there is no strict accountability of how much each person takes. It is also easily compatible with Authority Ranking, as is the case of family relations of intense (CS) affection and caring between parents and their children, coupled with asymmetric decision-making and responsibility. On the other hand, it appears often incompatible with Market Pricing, as people have difficulty in calculating a tradeable value for CS social bonds or even objects that embody those bonds (Fiske & Tetlock, 1997).

The constitution of communal sharing through social interactions

Complementarity Theory (Fiske, 2000) specifies that social relations are constituted in the flow of social interactions through culturally defined behaviours that complement peoples' model-specific cognitive structures and innate motivations to use each relational model. People are predisposed to use the relational models because each model is both motivationally satisfactory and readily identifiable in social relations. Also, the cognitive structures related to the models are embodied in people's physical interactions with each other (Schubert et al., 2007).

Communal sharing relations are mostly constituted by physical or symbolic bodily connections, or bonds, that implicitly transmit inherent 'essences' through 'consubstantial assimilation': people 'assimilate' common substances that connect them; communal sharing norms (e.g., sharing resources as a commons) can also constitute CS, but do not have the same motivational strength (Fiske, 2004). Enactments of consubstantial assimilation include kissing, cuddling, breast-feeding, sexual intercourse, and spit- or blood-bonding rituals (Fiske, 2004), synchronous movements (e.g., Paladino et al., 2010), touching (e.g., Sekerdej et al., 2018), and commensalism or commensality, that is, the shared consumption of food and drink (Miller et al., 1998). A mix of commensality and implied sharing of saliva via eating utensils and direct feeding is identified by children as distinctive of ´thick´ relationships (Thomas et al. 2022), which are typically structured mostly on CS.

Commensality and communalism

In the current research, we focus on commensality. This is one of the most basic forms of consubstantial assimilation, because sharing the same type of food or drink

implies the ingestion of a common essence or substance (Fiske, 2004). Historical and anthropological evidence shows that eating is for humans an intensely social activity, fundamental for the establishment and nurturing of social relations and group belongingness (Sobal, 2000). From prehistoric to contemporary societies, commensality establishes and defines the degree of social closeness of relationships (Bloch, 1999; Restelli, 2011). In industrial societies, the family remains both the basic commensal unit (Sobal & Nelson, 2003) and the group in which bonds are most based on communal sharing (Brito et al., 2011). People eat more when they eat with others (Higgs & Ruddock, 2020), but especially with family or friends (De Castro, 1994). Commensality outside the family can promote trust (Woolley & Fischbach, 2017), group cohesion and performance (Kniffin et al., 2015). Surprisingly, the study of the psychological role of eating in human sociality has been almost absent from the social psychological literature (Rozin, 1999; 2001). Previous research indicates that people perceive more intimacy between targets who share food from a common source than between targets who simply interact (Miller et al., 1998), but there is no experimental research on the relational effects of people eating together.

In this paper, we test the effects of commensality on the *emergence* of communal (CS) relations in experimental groups. Importantly, neither CS nor any other of the relational models is postulated only as a model that *defines* a fully established relationship: rather, it can emerge and be used to a smaller or greater extent in any relationship. We took advantage of this characteristic of CS for our experimental paradigm, in which we isolate the effects of commensality from the well-established, intensively CS-based relations in families and romantic couples, associated to domestic or segregative forms of well-established commensality (Grignon, 2001). The reasoning

is that in ambiguous situations the presence of clues that represent prototypical modes of constitution of CS, such as commensality, should increase the accessibility of the CS-relational model as a mode of interpreting this situation. As a result, other components of CS that are not part of the experimental demand characteristics imposed on the participant should be 'filled in' by participants' relational cognition, thereby further increasing the use of CS. We will refer to this process in the following as *emergent communalism*. Therefore, even if we did not expect that commensality would automatically create a full fetched CS relationship between participants interacting for some minutes in a lab, our main hypothesis was that - compared to a control condition - commensality should increase perceptions, cognitions and feelings associated with CS with the commensal group, such as warmth, overlap of self and group, and a welcome anticipation of CS relation.

Warmth is one of the two major dimensions in social perception, the other being competence; warmth includes traits such as sociability, good nature, helpfulness, and 'warmth', and is associated to trust, closeness, and communalism in social relations (S. Fiske et al., 2007). It is also an actual social emotion one can feel towards others (Watson et al., 1988), and can be used as a measure of attitude towards people or other objects. Feeling warmth in others and towards others is key to understanding the social world in terms of inclusion or exclusion from a communal-type group (Fiske & Fiske, 2010). 'Warmth' in this sense is used in language as both a set of traits and a perceived relational attitude of others (individuals, groups) towards whom one feels trust and by whom one feels included. The representation of others as warm to oneself and of one's warmth towards others can be based on an actual feeling when people feel socially included, because people help regulate each other's body temperatures by sharing

physical warmth (IJzerman & Semin, 2010; IJzerman et al., 2018a, 2018b). Warmth can even be an intense physical sensation warmth associated to being moved by a sudden surge of salience of communal relations, or *Kama Muta* (Fiske et al., 2019; Zickfeld et al., 2019).

Anticipations of CS relations with a person or group can also indicators of emergent communalism. Anticipating that eventual future interactions with a person or group will be structured according to the CS model (e.g., making decisions by consensus, sharing resources communally, developing similar attitudes). Together with a preference to continue to engage socially with the experimental group, this anticipation is a good indicator that CS is emergent in that social relation. CS is also the most primal of relational models and therefore one that people feel easily and are intrinsically motivated to pursue, if socially appropriate cues are present (Fiske & Fiske, 2007). Thus, a preference to continue to engage in interactions with the group can be an indicator of motivational engagement with the communal model promoted by the social interaction. The degree of perceived overlap of the self with others or a group (Aron et al., 1992) can be an even closer indicator of disposition to engage in the social relation according to the CS model, as fusion of the self and other is the representational structure of communal sharing (Fiske, 1991).

To sum up, we hypothesized that experimentally induced commensalism should increase emergent communalism, measured by a variety of indicators that are conceptually and empirically associated with CS. These indicators also constitute what is often described as cohesion within social groups. Hence our claim that commensalism as a relationally meaningful interaction can be the basis of group formation. Note that

we do not assume that people have to be aware of the relational meaning of their interaction.

Social bonds and ingroup favouritism

The proposal that group formation can emerge from relational interactions, particularly from those suggesting CS, has implications for the role of ingroup favouritism in such group contexts. RMT differs from classical approaches to group psychology in the proposed relation between ingroup bonds and intergroup relations. Ingroup favouritism (treating ingroup members more favourably than outgroup members) is a robust phenomenon across a diversity of experimental and real group settings whether based on interdependence and ingroup reciprocity, or identity and ingroup enhancement (e.g., Balliet et al., 2014; Brewer, 1999; Dovidio & Gaertner, 2010). Significantly, positive ingroup and negative outgroup attitudes are not usually correlated, and ingroup positivity is stronger than outgroup negativity (Brewer, 1979; Brewer & Campbell, 1976; Mummendey & Otten, 1998), indicating a psychological primacy of ingroup over intergroup relations (Allport, 1954; Yzerbyt et al., 2000). Evolutionary perspectives suggest that group living was the primary environmental condition in human evolution (Brewer & Caporeal, 2006) and geographical dispersion was an alternative to intergroup competition (Leakey & Lewin, 1978; Mellars, 2006). In most cultures, affiliation and attachment to couples and families - for which outgroups are largely irrelevant - are more important than other ingroups for people's well-being (Baumeister & Leary, 1995; Leary, 2010). And intergroup comparisons are even less important for group identity and attachment in East Asian than in Western cultures (Yuki, 2003). Some experimental research has also shown that ingroup liking and

attachment can be produced in the absence of any potential comparison outgroup (Gaertner et al., 2006).

We propose that in contrast to group formation based on interdependence or shared comparative social identity, emergent, communal sharing-based group bonds do not create or enhance ingroup favouritism as part of the group formation process, for two reasons. First, although the extent of communal inclusion can be environmentally constrained (Rai & Fiske, 2011) it is not necessarily defined a priori. Second, any combination of relational models for ingroup and intergroup relations is possible (e.g., a family running a business; a clan occupying a high-status social position; equality-based diplomatic relations between authoritarian nations; Fiske, 1992) and depends on cultural complements to the relational models (Fiske, 2000). In other words, there may be conditions that combine ingroup CS with ingroup favouritism or any other kind of relation to outgroups but producing emergent CS by itself should not be enough to produce ingroup favouritism.

The present research

In the studies reported here our main interest was to test commensality as a form of constituting emergent communal sharing. We manipulated commensality between participants in 3-person groups, and measured participants' perception of their groups. Our main hypothesis was that a commensal consumption of a common food or drink with strangers enhances participants' perception of emergent communalism in the group (H1). As a specification of H1, we also tested the hypothesis that this was only the case for sharing from the same source, implying consubstantial assimilation (H1a). Additionally, we tested the hypothesis that commensality does not enhance ingroup

favouritism towards an outgroup for which there are no relational cues (H2), and a specification that it would enhance ingroup favouritism *if* the outgroup is explicitly excluded from commensality (H2a).

Overview of the experiments

In Experiments 1 and 2 we manipulated group commensality with the consumption of a dessert, and in Experiments 3 and 4, with the consumption of water. In all four experiments, participants in three-person sessions were told that they formed a group prior to engaging (or not) in a group activity constituting the manipulation. They were next asked to distribute points between one of the other members of their group and an anonymous outgroup member, and to rate their relations with their ingroup on several measures of emergent communalism. All the experiments were carried out at a Western European university, and participants were recruited on campus. Participants were recruited from different courses and recruiters made sure the participants did not know each other.

In Experiment 1, we tested H1 that commensality produces emergent communalism, as well as H2 that it has no effect on ingroup favouritism in the distribution of resources, by comparing it with two control conditions: a non-ingestible 'common pot' control situation and a no-task condition. In Experiment 2, we attempted to replicate H1, but our main aim was to test H2a that *exclusive* commensality (i.e., reporting that an outgroup had *not* eaten the same food) would enhance ingroup favouritism. In Experiments 3 and 4, we tested Hypothesis 1a, that the effect of commensality on emergent communalism was due to commensality from the same source, (i.e., consubstantial assimilation) and replicated the test of H2.

A Word file with Supplementary Materials (codebooks, syntaxes, G power protocols, verbatim wording of the measures analysed, detailed methods and procedures sections, and supplementary tables) is provided on the Open Science Foundation online repository. Also provided are the SPSS datafiles for each experiment with the original independent and dependent variables, restructured longform datafiles, and an SPSS Syntax file with the models tested, as well as an Excel file with power conversions. All files can be found here: https://osf.io/zmexf/?view_only=6563025366a049a6a6c6f004ee8d0dd7.

Sample sizes

We had no way of predicting the effect sizes a priori, as there is a lack of experimental research on this topic. We therefore settled for an initial pragmatic approach of recruiting as many participants as would be possible within a reasonable timespan of (c. 1 month) to have them participate in similar conditions in the experiment and given that we had to recruit three participants at the same time, who did not know each other, for each session. In Experiment 1 this resulted in a sample size of $N = 72$ ($n = 24$ per condition) We then stuck to similar sample sizes per condition throughout the studies. We did not look at the data before stopping data collection for each study.

We ran post-hoc sensitivity power analyses using G*Power (Faul et al., 2007) for the single regression coefficient of the critical contrast analyses of each experiment, considering the $k = 7$ of simple and interaction predictors. We had 80% power to detect effects above .53 < Cohen's d < .59 ($p = .05$, one-tailed), depending on the power and given the respective sample sizes. These analyses are an approximation that do not take into account the random effects models. Specific analyses using G*Power are provided

in the respective results sections. We also carried out meta-analyses of the four studies separately for emergent communalism and intergroup favouritism.

Statistical analyses

Because we could not assume responses of participants in the same session to be independent from each other, and because we used several interrelated measures of emergent communalism and of ingroup favouritism, we used linear mixed models to analyse the effect of commensality on emergent communalism and ingroup favouritism. Using the MIXED command in SPSS, we first modelled the random effects to control for possible interdependence of the data depending on participant, group (i.e., session), and measure (codes for sessions were added as a grouping variable; participants in each session were coded 1-3), allowing the intercepts to vary randomly between groups, between participants nested in groups, and between measures nested in participants.

We also included for exploratory purposes self-report measures of emotions (all experiments), perceived essentialism (experiments 1, 2, and 4), social identification (experiments 2, 3, and 4[8]), and social values (experiment 3), which are not relevant for the current analysis.

Because the session group had only a significant effect in one of the eight models analysed and the Inter-class correlation was lower than 5% in all the studies, we dropped it from the full models to gain parsimony. We added to the full models the fixed effects of condition, gender, and measure. We used Restricted Maximum Likelihod (REML) as the estimation method. We then used contrast analyses to test custom hypotheses specific to each experiment, in which we gave the same weight to

[8] Although we would not expect our designs to produce effects on explicit measures of social identification, we did check if there were any effects of commensality on identity, and found none, despite positive correlations between those measures and emergent communalism measures; we also found no simple or moderation effects of identification on ingroup favouritism.

each measure, condition, and gender. All measures were *z*-standardized to facilitate comparability and estimation of β values as effect sizes for these tests. Degrees of freedom are reported with the Satterthwaite (1946) approximation for multiple linear models.

For the covariance matrix structure of the repeated measures factor in the analyses of the effects on emergent communalism, we used Autoregression 1, as the measures were always presented in the same order and could have affected each other. In the ingroup favouritism analyses, because we presented the measures in random order, we used a diagonal covariance structure for the repeated measures when it fit the data and Toeplitz, AR1 or ARH when it did not.

Tables with full reports of the random and fixed effects model are provided in the Supplementary materials on the OSF website. We report here all measures and manipulations used in the studies, including measures not analysed in the results. There were no exclusions of participants.

Experiment 1

This experiment tested the effect of commensality on emergent communalism and ingroup favouritism. We expected commensality to enhance emergent communalism but not ingroup favouritism, compared to both sharing a non-ingestible substance from a 'common pot' and to non-sharing. This is a critical test because our main hypothesis implies that commensality has a unique effect on emergent communalism beyond the possible effect of sharing a resource as a commons.

Method

Participants and design

Seventy-two undergraduate students (51 female) aged between 18 and 33 years (M = 20.33, SD = 2.63) were recruited on campus and participated in 3-person same-gender sessions in exchange for 5€ gift vouchers. Sessions were randomly assigned to three conditions: group commensality (n = 24; $n_{sessions}$ = 8), non-food group-sharing control (n = 24; $n_{sessions}$ = 8), and non-sharing control (n = 24; $n_{sessions}$ = 8). G*Power sensitivity power analysis indicated that we had 80% power to detect effects above d = .59 (p = .05, one-tailed).

Procedure and materials

Participants sat at a round table and read a cover story stating that the purpose of the experiment was to study the influence of different activities on visual perception. In the 'commensality' condition participants were asked to eat a dessert (mango mousse) that they served themselves from a common bowl onto individual bowls. In the non-food group-sharing control condition, they were asked to take paint from a common bowl onto individual bowls and use it to colour a sheet of paper. In both conditions, no order of serving was specified, and participants were told to take as much food/paint as they wanted. This was followed by a bogus perceptual paper-and-pencil test. In the non-sharing control condition, participants started the experiment directly with this bogus test. They next performed a resource distribution task with a separate booklet containing the ingroup favouritism measures. Finally, the measures of emergent communalism were presented in a separate questionnaire ostensibly as a pre-test for an unrelated study. Participants were told they would carry out a group task after the second questionnaire, but after they had finished it they were debriefed and told that they would not be carrying out a group task after all.

Measures

Emergent communalism: The measures were presented in the following order. Participants were asked to imagine that they would participate with the same group of participants in a subsequent group situation on a different day, and asked to rate on a 7-point scale (not at all-absolutely) the degree to which they thought they would relate to the other group members on eight items adapted from the Communal Sharing scale of the Modes of Relationships Questionnaire (MORQ, Haslam & Fiske, 1999), e.g., "If you would have to make decisions you would tend to do it by consensus"; "If one of you needed something, the others would give it without expecting anything in return" (*Prospective Ingroup Communal Sharing*, $\alpha = .88$, $M = 3.71$, $SD = 1.10$). Participants were next asked to rate the other group members as to how "*warm*", and "*nice*" they were, ($r = .91$, $M = 3.32$, $SD = 0.99$). Previous research suggests that warmth, as a social trait, is related to communal bonds (Ijzerman & Semin, 2010). Participants rated their representation of their relationship with their group on a pictorial measure of *Self-Group Overlap* (Schubert & Otten, 2002) based on the Inclusion of Other in the Self Scale (Aron et al., 1992): 5 pictures depict a smaller circle (Self) and a larger circle (Group) placed in progressively closer proximity to each other ($M = 3.01$, $SD = 1.38$). Participants rated their *Attitude* towards their ingroup on a bipolar thermometer scale (0 'cold' - 100 'warm'). Warmth indicates a more positive attitude ($M = 48.69$, $SD = 23.01$). Finally, we included a *behavioural measure* of group vs. individual orientation: participants had to respond to a bogus question on whether they would like to complete the next task individually (coded 1, $n = 7$) or with their group (coded 2, $n = 65$; $M = 1.90$, $SD = .30$). The five indicators of emergent communalism were all inter-correlated ($\alpha = .79$).

Ingroup favouritism: We used the Tajfel matrices, consisting of several forced-distribution choices between anonymous ingroup and outgroup members from which different indicators of ingroup favouritism can be derived (Tajfel et al., 1971; Bourhis et al., 1994). Participants were instructed to think of themselves as a group and to allocate points to another unidentified member of their group and to an unidentified member of a different group ostensibly performing the same experiment in a different room. Each point would be converted into money (1 point = 1 cent) and distributed in the form of rewards for participation in the experiment. We used matrices A1, A2, B1, B2, C1, and C2, which allow choices to be scored in terms of the different psychological pulls assumed to be exerted by conflicting strategies implied in the forced-choice options: maximum joint profit (MJP), maximum ingroup profit (MIP), maximum (intergroup) differentiation (MD), and equal outcomes, or 'parity' (P); MIP and MD together pitted against either P or MJP are designated ingroup favouritism (FAV). We used three pull scores (-12 – +12) that express ingroup favouritism (α= .87): FAVonP (*M* = 5.10, *SD* = 5.52), FAVonMJP (*M* = 4.96, *SD* = 5.37), and MDonMIP_MJP (*M* = 2.66, *SD* = 4.20). One participant (in the 'paint' condition) did not respond to the ingroup favouritism measures.

Results

Emergent communalism

In the random effects model, group-level variance was not significant, Wald *Z* = 1.848, *p* = .065, and accounted for <1% of total variance, so we removed it. In the final full model, emergent communalism varied significantly between participants, the variance of measures was significant (AR1 diagonal) and responses to each measure had

a positive impact on responses to the subsequent measure (AR1 rho). The person-level intercept had an estimated $M = 0.10$ (95% CI [-0.39, 0.59], $SE = 0.25$. In addition to the random factors, the full model included the fixed effects of the experimental manipulation (commensality vs. non-food sharing control vs. non-sharing control) and gender as between-participants factors and of measure as within-participant factor. The main effects of condition and gender were significant, as well as the interaction betw een gender and measure. However, we were not theoretically interested in the gender-related effects.

As a more precise test of our hypothesis, we replaced the omnibus test with two orthogonal contrasts, one comparing commensality to the two control conditions, and one comparing the two control conditions to each other. These contrasts also require specification of weights for the interactions; both genders and all measures were given equal weight. The first contrast was significant, indicating that intragroup relations were perceived as significantly more communal in the commensality condition than in the two control conditions combined, $t(66.79) = 2.31$, $p = .024$, $\beta = .28$, 95% CI [.04, .52], $SE = .12$, $d = 0.58$. The residual contrast testing the difference between the two control conditions was nonsignificant, $t(66.79) = -1.48$, $p = .144$, $\beta = -.15$, 95% CI [-.35, .05], $SE = .10$, $d = 0.30$ (Table 1).

Ingroup favouritism

We ran the same type of MIXED model analyses that we had run for ingroup communalism, but with a diagonal covariance structure for the repeated measures factor, because we could not fit the data to AR1 or Toeplitz covariance structures. We first ran the random effects model, which showed that there was no session group-level variance, Wald's $Z = 0.19$, $p = .846$. In the final model (Table 1), from which we

dropped the group-level factor, the participant-level and indicator-level variances were all significant. The person-level intercept has an estimated *M* = -0.23 (95% CI [-0.81, 0.35]) and an estimated *SE* = 0.29. We found a theoretically irrelevant effect of measure and an effect of the manipulation; there were no other significant effects.

We ran the same contrast analyses that we had ran for communalism, and found that ingroup favouritism was actually *lower* in the commensality condition than in the other two conditions, $t(64.86) = -2.17$, $p = .034$, $\beta = -.36$, 95% CI [-.69, -.03], *SE* = .15, $d = 0.77$. The orthogonal contrast also indicated that ingroup favouritism was higher in the non-food group-sharing control (paint task) than in the no-task control, $t(64.86) = 2.92$, $p = .005$, $\beta = .42$, 95% CI [.13, .70], *SE* = .10, $d = .93$ (Table 1).

Discussion

The results of Experiment 1 were consistent with our main hypothesis that commensality enhances ingroup bonds of a communal type in emergent groups. Importantly, this was not due to the sharing procedure (from a common pot), used also in the non-food sharing control condition. We also found support for our secondary hypothesis: ingroup favouritism was not enhanced by commensality; indeed, it was *lower* in the commensality condition than in the two controls, particularly the non-food sharing control condition.

Experiment 2

In Experiment 1, participants had not been informed about whether outgroup members were also eating something and could have assumed the outgroup ate the same food as they did (a form of intergroup inclusive commensality), driving down the effect

of ingroup favouritism. To rule out this possibility, in Experiment 2 we manipulated perceived intergroup inclusive commensality in two otherwise similar ingroup commensality conditions. We expected that, as in Experiment 1, there would be more ingroup emergent communalism in the commensality conditions than in the control condition (H1); but we also tested whether there was more ingroup favouritism in the exclusive commensality condition than in the inclusive commensality condition and the control condition (H2a).

Method

Participants and design

Ninety undergraduate students (48 female) aged between 18 and 27 years (M = 20.00, SD = 1.91) participated in same-gender experimental sessions in exchange for 5€ gift vouchers. Sessions were randomly assigned to the inclusive commensality (n= 30, $n_{sessions}$ = 10), exclusive commensality (n = 27; $n_{sessions}$ = 9), and control (no ingroup commensality; n = 33, $n_{sessions}$ = 11) conditions. G*Power sensitivity power analysis indicated that we had 80% power to detect effects above d = .53 (p = .05, one-tailed).

Procedure, materials, and measures

The procedure in the control condition was the same as in the no-task control condition in Experiment 1. In the two commensality conditions it was mostly the same as in the commensality condition in Experiment 1. However, before being given the separate booklet in which participants were asked to perform the same resource distribution task as in Experiment 1, participants in these two conditions were either told that the outgroup had also consumed mango mousse (inclusive commensality) or

had eaten nothing (exclusive commensality). In the control condition they were simply told that the outgroup was another group participating in the experiment.

Measures of emergent communalism were presented in the same order as in Experiment 1 and also in a separate questionnaire, and were all intercorrelated (α=.70): *Prospective Communal Sharing* (eight items rated 0-6; α=.84; *M* = 3.50, *SD* = 0.98); rating of other group members as *warm* and *nice* (1-7; *r* = .70; *M* = 4.50, *SD* = 1.35); perceived *Self-Group Overlap* (1-5; *M* = 2.81, *SD* = 1.25); thermometer measure of *Attitude* toward the ingroup (0-100; *M* = 40.87, *SD* = 20.19); and the *behavioural measure* of preference for participating again with the group (1-9; *M* = 5.89; *SD* = 2.04). The ingroup favouritism measures were the same as in Experiment 1: FAVonP (*M* = 5.10, *SD* = 5.50), FAVonMJP (*M* = 4.96, *SD* = 5.35), and MDonMIP_MJP (*M* = 2.66, *SD* = 4.18), which were also all intercorrelated (α=.78).

Results

Emergent communalism

In the random effects model, group-level variance was not significant, Wald *Z* = 1.47, *p* = .141. In the final model, emergent communalism varied significantly between participants, and the variance of measures was significant, (AR1 diagonal), but responses to each measure did not have an impact on responses to the subsequent measure (AR1 rho). The person-level intercept had an estimated mean of -0.03 (95% CI [-0.49, 0.43]) and an estimated *SE* of 0.23. The fixed main effect of gender as well as the interaction between gender and measure were significant, although theoretically irrelevant.

The orthogonal planned contrast effect testing H1 showed that intragroup relations were not significantly perceived as more communal in the two commensality conditions combined than in the control condition, $t(83.89) = 1.24$, $p = .219$, $\beta = .12$, 95% CI [-.07, .31], $SE = .10$, $d = 0.24$. The residual contrast testing the difference between the two commensality conditions was also nonsignificant, $t(83.89) = 1.58$, $p = .118$, $\beta = .14$, 95% CI [-.04, .31], $SE = .09$, $d = 0.28$ (Table 2).

Ingroup favouritism

The random effects model showed that the session group-level variance was significant, Wald's $Z = 2.00$, $p = .046$. We decided however to drop the group-level factor from the full model, because we were more concerned with Type II than Type I error for ingroup favouritism and it would be easier to compare to the other studies. In the full model, ingroup favouritism varied significantly between participants, and the variance of each of the three measures was significant. The person-level intercept has an estimated mean of -0.07 (95% CI [-0.60, 0.46]) and an estimated *SE* of 0.27. We found a theoretically irrelevant effect of measure, but no other significant effects.

To test the specific hypothesis (H2a) that *exclusive* commensality, but not inclusive commensality, would enhance ingroup favouritism, we ran a planned contrast analysis pitting exclusive commensality against the other two conditions. We found no effect, $t(79.80) = 0.56$, $p = .575$, $\beta = .08$, 95% CI [-.19, .35], $SE = .14.$, $d = 0.16$, nor of the residual contrast pitting inclusive commensality against the control condition, $t(79.80) = -0.55$, $p = .583$, $\beta = -.06$, 95% CI [-.27, .16], $SE = .11$, $d = 0.12$. (Table 2).

Discussion

We found no effect of exclusive commensality on ingroup favouritism, irrespective of whether participants were informed that the outgroup also ate mango mousse, which suggests that possible implied consubstantial assimilation with an outgroup (i.e., eating the same kinds of foodstuff) did not dampen ingroup favouritism in the commensality condition in Experiment 1. Contrary to what we expected, however, commensality did not have a significant effect on emergent communalism, either, although the pattern of means would indicate greater ingroup commensality in the inclusive commensality condition than either in the exclusive commensality or control conditions. It is possible that in the condition in which the outgroup was presented as not having eaten, the artificiality of the experimental situation in which participants were placed was made salient, and the consequences of commensality for perceived emergent communalism were partly neutralized. Also, considering the statistical power of each of these studies, it is not wholly unsurprising that the first replication attempt of the result from study 1 was unsuccessful. We therefore ran another follow-up study to Experiment 1, but this time addressing a number of confounds between different components of commensalism that were present in the first two Experiments.

Experiment 3

In this experiment, we aimed to disentangle the specific contributions of three different components of commensality on emergent communalism and ingroup favouritism, which were confounded in experiments 1 and 2: (a) simple co-action, or consumption of food or drink in the company of others doing the same; (b) perceived equivalency due the consumption of the same type of food or drink (e.g., increasing the

structural fit of the group membership, see Turner, 1987); and (c) the additional impact of consuming from a common source, which implies consubstantial assimilation. We were also concerned that there could have been a confound effect of caloric intake enhancing better mood and more positive attitudes towards both ingroup and outgroup. To rule this out, we manipulated commensality using water rather than food. We expected the highest levels of emergent communalism in a commensality condition with consubstantial assimilation and lowest in the control condition.

Method

Participants and design

Eighty-four undergraduate students (42 female) aged between 18 and 28 years (M = 20.57; SD = 1.80) participated in exchange for the chance to win a 100€ shopping voucher in a lottery among participants. They were recruited to participate in 28 3-person same-gender group sessions randomly distributed across four conditions (all with n = 21 and $n_{sessions}$ = 7): control, simple commensality, equivalence commensality, and consubstantial assimilation commensality. G*Power sensitivity power analysis indicated that we had 80% power to detect effects above d = .55 (p = .05, one-tailed).

Procedure, materials, and measures

Participants were recruited individually on campus immediately prior to a session and taken to a small room with a round table in the middle. They were told this was a market research study on brands of water. They were seated at a hexagonal table equidistantly from each other and given time to read and sign the informed consent form. The sessions were run by two different female experimenters (balanced over

conditions) and several recruiters. None of the participants in each group knew each other beforehand.

In the control condition, each participant was asked to evaluate the attractiveness of an image of a different empty bottle (of a different brand). In the simple commensality condition, participants were each given a 33cl bottle of water of a different brand from each other and asked to drink from it and to respond to a short survey in which they evaluated the water. In the equivalency commensality condition, the water bottles were of the same brand. In the commensality with consubstantial assimilation condition participants were asked to serve themselves from a common 1.5l bottle of water onto individual plastic cups.

After evaluating the bottles or water, participants responded to an allegedly unrelated questionnaire, in which they first responded to ingroup favouritism measures and then to communal sharing-related measures. They did *not* complete a bogus perceptual task as in Experiments 1 and 2. The questionnaire was opened for them in the Qualtrics online platform on individual laptops. Participants were seated and laptops were placed so that they would not be able to see how others responded to the questionnaire.

We used the same measures as in Experiments 1 and 2 to measure emergent communalism (α=.74): *prospective ingroup communal sharing* (adapted MORQ CS 8-item subscale, α = .75; 1-7, *M* = 4.45, *SD* = .95), *self-group overlap pictorial measure* (rated 1-5; *M* = 2.27, *SD* = 1.10), *attitude towards the ingroup on a temperature scale* (0-100; *M* = 50.37, *SD* = 20.47), ratings of ingroup members as *warm* and *nice* (1-7; *M* = 5.05, *SD* = 1.29, and degree of preference for remaining with the group for a subsequent experiment (1-7; *M* = 4.25, *SD* = 1.24). We used only four of the six

matrices for resource distribution used in Experiments 1 and 2 to measure *ingroup favouritism*: the A1/A2, and C1/ C2 Tajfel (1970) matrices, from which we computed the pull scores for FAVonMJP (M = 0.49; SD = 3.66) and FAVonP (M = 0.62; SD = 3.82) (r = .64).

Results

Emergent communalism

In the random effects model, group-level variance was not significant, Wald Z = 1.61, p = .108, so we removed the random effect of group membership from the final model. In the final model (without the group-level random effect), emergent communalism varied significantly between participants, the variance of measures was significant, and responses to each measure did not have a significant impact on responses to the subsequent measure (AR1 rho). The person-level intercept has an estimated mean of -0.27 (95% CI [-0.29, 0.83]) and an estimated *SE* of 0.28. There were no significant fixed effects except a theoretically irrelevant interaction between gender and measure.

The orthogonal planned contrast testing H1a, however, showed that intragroup relations were significantly perceived as more communal in the commensality with consubstantial assimilation condition than in the other three conditions combined, t(76.09) = 2.05, p = .044, β = .28, 95% CI [.01, .54], SE = .13, d = 0.58. The residual contrast testing the difference between commensality with same-brand separate bottles and the simple commensality and the control condition combined was not significant, t(76.37) = 0.06, p = .955, β= .01, 95% CI [-.26, .27], SE = .13, d = 0.02; the residual contrast testing the difference between the simple commensality condition with bottles

of different brands and the control condition was also not significant, $t(76.44) = 0.96$, $p = .338$, $\beta = .10$, 95% CI [-.11, .32], $SE = .11$, $d = 0.20$ (Table 3).

Ingroup favouritism

We ran the same mixed models as for communalism. In the random effects model, using any type of covariance structure we could not fit any model including a group level random effect to the data, so we removed it from the analysis. In the full model, the variance of both measures of ingroup favouritism and the variance associated to the participant level were all significant. We found a theoretically irrelevant interaction of gender and manipulation. There were no other significant effects.

The person-level intercept had an estimated mean of -0.03 (95% CI [-0.49, 0.43]) and an estimated *SE* of 0.23. The contrast testing the effect of commensality with consubstantial assimilation against the other three conditions was nonsignificant, $t(75.87) = 1.16$, $p = .249$, $\beta = .20$, 95% CI [-.14, .53], $SE = .17$, $d = 0.41$. The residual contrast testing the difference between commensality with same-brand separate bottles and the simple commensality and control condition combined was also nonsignificant, $t(75.93) = -1.42$, $p = .160$, $\beta = -.24$, 95% CI [-.56, .10], $SE = .17$, $d = 0.49$, as was the residual contrast testing the difference between the simple commensality condition with bottles of different brands and the control condition, $t(76.26) = -1.77$, $p = .081$, $\beta = -.16$, 95% CI [-.33, .02], $d = 0.32$. (Table 3).

Discussion

In sum, we confirmed that commensality with water had the same positive effect on emergent communalism that we had found with a dessert in Experiments 1 and 2, and no effect on ingroup favouritism. However, our results also suggested that eating food and drink together was not sufficient to produce a perceived communality with

other members of the group. In support of H1a, the effect of commensality on emergent communalism required sharing water from the same bottle, thus signaling the idea of sharing the same substance from the same source.

Experiment 4

In Experiment 4 we wanted to replicate the main finding of Experiment 3 in support of H1a (commensality enhances emergent communalism only when coupled with sharing from a common source), as well as to test the effect of commensality orthogonally to the 'common pot' rule implied in situations of commensality with consubstantial assimilation from the same source. Because in Experiment 3 there was no difference between drinking the same vs. different brands of water, we used the same brand for all participants. The dependent variables were mostly the same that were used in Experiments 1-3.

Method

Participants and Design

Eighty-four university students (45 female and 39 male; aged 18-28 years, *Mage* = 20.74, *SDage* = 2.59 years) were recruited to participate in 28 3-person same-gender group sessions, randomly distributed across four conditions (each, $n = 21$, $n_{sessions} = 7$): commensality with consubstantial assimilation, commensality with equivalence, control with common bottle, control with equivalent bottle. G*Power sensitivity power analysis indicated that we had 80% power to detect effects above $d = .55$ ($p = .05$, one-tailed).

Procedure, materials, and measures

The sessions were run over a period of three weeks by one experimenter, one assistant experimenter, and two recruiters (all female). Procedures were the same as in Experiment 3 except for the differences in the manipulations: In the two commensality conditions, participants were given bottles of water to drink and asked to evaluate its taste just like in the commensality conditions in Experiment 3 (equivalence vs consubstantial assimilation conditions), but in the non-commensality condition they were given empty bottles to evaluate their attractiveness, instead of viewing images of bottles. The common vs equivalent bottle manipulation consisted of placing one 1.5-litre bottle in the middle of the table vs three 33cl bottles, one in front of each participant in the session.

To measure Ingroup Favouritism we used the six Tajfel (1970) matrices used in Experiments 1 and 2 to measure three pull scores (α = .72): FAVonMPJ (*M* = 1.92; *SD* = 4.04), FAVonP (*M* = 1.11; *SD* = 4.56), and MDonMIP/MJP (*M* = 1.38; *SD* = 4.90). To measure emergent communalism, we also used the same measures as in experiments 1 to 3, in the same order (α = .83): the 8-item MORQ CS subscale for *prospective communal sharing relations*, (scored 1-7; α = .85; *M* = 4.34; *SD* = 1.11); *Self-group Overlap pictorial measure* (scored 1-5; *M* = 3.61; *SD* = 1.27), *attitude towards the ingroup* (thermometer scale; scored 1-100; *M* = 64.80; *SD* = 23.04), ratings of ingroup members as *warm* and *nice* (scored 1-7; *M* = 5.26; *SD* = 1.20) and the *behavioural intention* measure asking them to what extent they would like to remain with the group in a subsequent experiment vs alone (scored 1-9; *M* = 6.79; *SD* = 1.93).

Results

Emergent communalism

In the random effects model, group-level variance was not significant, Wald Z = 1.86, p = .063, so we removed the random effect of group membership from the models with the fixed effects. In the full model, emergent communalism varied significantly between participants, the variance of measures was significant (AR1 diagonal) and responses to each measure had a significant positive impact on responses to the subsequent measure (AR1 rho). The person-level intercept had an estimated mean = -0.06 (95% CI [-.86, .74]) and an estimated SE = 0.40. The manipulation factor was non-significant (p = .095) and no other factor reached significance.

Importantly, however, the planned contrast testing H1a showed that intragroup relations were perceived as significantly more communal in the commensality with consubstantial assimilation condition (taking water from the same bottle) than in the other three conditions combined, t(76.50) = 2.27, p = .026, β = .35, 95% CI [.04, .65], SE = .15, d = 0.75. The residual contrast testing the difference between commensality with separate bottles and the two non-commensality conditions was not significant, t(76.50) = 0.97, p = .335, β= .15, 95% CI [-.15, .45], SE = .15, d = 0.30; the residual contrast testing the difference between single vs separate bottles without commensality was also not significant, t(76.50) = -1.34, p = .185, β= -.20, 95% CI [-.50, .10], SE = .15, d = 0.40 (Table 4).

Ingroup favouritism

We ran the same mixed model as for communalism and tested the effect of the commensality with consubstantial assimilation on ingroup favouritism with planned contrasts for the three pull scores that we computed (FAVonP, FAVonMJP, and MDonMIPMJP). For the repeated measures factor of the random effects model, neither the Diagonal nor the Toeplitz structure fit the data; the AR1 covariance structure also

did not fit the data, but the ARH, which adds parameters by calculating different variances for each of the three measures, did fit the data. This model indicated that the group-level variance was not significant, Wald's $Z = 0.04$, $p = .965$, so we removed the random effect of group from the model. In the final model, we used AR1 rather than AR1 heterogenous because it *did* fit the data and has less parameters and is thus more parsimonious. The participant-level variance was significant and so was the variance of the measures of ingroup favouritism (AR1 Diagonal), but the relation between each measure of ingroup favouritism with the adjacent measure in the data file was not significant (AR1 rho). The person-level intercept had an estimated mean of -0.08 (95% CI [-0.90, 0.75]) and an estimated *SE* of 0.42. We found no effects of manipulation, measure, gender, or interactions.

We ran the same contrast analyses that we had ran for communal sharing, but found no difference between the commensality with consubstantial assimilation condition and the three others, $t(76.69) = 0.32$, $p = .750$, $\beta = .05$, 95% CI [-.28, .38], $SE = .17$, $d = 0.11$. The orthogonal contrasts between commensality with separate bottles and non-commensality conditions combined, $t(76.69) = 0.37$, $p = .712$, $\beta = .06$, 95% CI [-.26, .38], $SE = .16 = .12$ and between single-bottle and separate-bottles non-commensality conditions, $t(76.69) = -0.15$, $p = .884$, $\beta = -.02$, 95% CI [-.35, .30], $SE = .16$, $d = 0.04$, were also nonsignificant (Table 4).

Discussion

This experiment replicated the results of Experiment 3, but also allowed for testing whether referring to the same source without commensality could explain results of the previous experiments. The results of Experiment 4 confirm that the effect of

commensality on emergent communalism is limited to sharing from the same source and vice versa, implying consubstantial assimilation, and that this has no effect on ingroup favouritism.

Meta-analysis

Because we were concerned that each of the studies had low statistical power on its own due to small sample sizes, we ran two meta-analyses of the effects of commensality on emergent communalism and ingroup favouritism, respectively (meta-analysis command of SPSS). Meta-analysis is appropriate for this as long as its interpretation is qualified by the fact that it represents the results of a small number of studies from the same research team and understanding the results does not require using study characteristics as moderator variables, in which case integrative analysis is more appropriate (Goh et al., 2016). We introduced the regression coefficients (Betas) of the planned contrast analyses as effect sizes and the standard errors as weights for each study, using a random effects model with Restricted Maximum Likelihood estimation. Results showed that the mean overall effect size of the effect of commensality on emergent communalism was $\beta = .23$, $SE = .06$, $Z = 3.85$, $p < .001$, CI [0.11; 0.35], $d = .48$; effect sizes were not significantly heterogeneous across studies, $Q(3) = 2.17$, $p = .538$, $Tau^2 = .000$; $I^2 = 0\%$ (Figure 1). As expected, the overall effect of commensality on ingroup favouritism was not significant, $\beta = -.01$, $SE = .12$, $Z = -0.11$, $p = .916$, CI [-0.26; 0.23], $d = .02$. Although effect sizes were not significantly heterogeneous across studies, $Q(3) = 7.49$, $p = .058$, we must note that the Q statistic is prone to Type II error with small k of samples and the % of variation due to heterogeneity rather than chance was moderate, $Tau^2 = .036$; $I^2 = 59.8\%$ (Figure 2).

General Discussion

Our research introduces a novel approach to understand the emergence of psychological groups, based on Relational Models Theory (Fiske, 1992). This theory assumes that people are generally motivated to engage in building social bonds for their own sake, and that these emerge through interactions that constitute these bonds according to specific models. In the current work we focus on communal sharing. This paper offers the first experimental evidence to support the hypothesis that commensality enhances emergent communalism, that is, feelings, cognitions and perceptions usually associated with communal sharing relations, and the disposition to engage in communal sharing as a form of relating to others within a group, but only when commensality implies consubstantial assimilation, that is, sharing from the same source (Fiske, 2004). This was shown with artificially created groups in the lab, stripped of all previous social bonds or meaning, rendering any occurring communalism emergent. We ruled out an explanation based on a resource-sharing norm (Experiment 1) and found that the effect was only present when commensality was from a common source, indicating consubstantial assimilation (Experiments 3 and 4). The results across the four experiments also support our hypothesis that, contrary to the classical ethnocentrism hypotheses that whatever enhances ingroup bonds also enhances ingroup favouritism (Sumner, 1906), commensality does *not* enhance ingroup favouritism, which we derived from the assumption of humans' intrinsic, non-competitive motives for sociability (Fiske, 1992; Costa, 2018). In Experiment 2 we ruled out implicit (intergroup) inclusive commensality as an alternative explanation. This suggests that the constitution of group bonds need not be seen as a necessary precursor to negative intergroup relations, a

biased view of groups that is common to, and has been criticized also, in other social sciences (Pisor & Surbeck, 2019). Although each of the four studies was somewhat underpowered for even a medium effect size of Cohen's $d = 0.5$, which could explain that we found a significant effect of commensality on emergent communalism in only three of the four studies, the meta-analyses of results suggest that commensality has a homogeneous and medium size effect on emergent communalism, and no effect on ingroup favouritism.

These studies explicitly focused on social interactions in controlled experimental conditions in the laboratory, stripped of any history of interpersonal or group relations, and thus offer some insight into the minimal conditions for constituting emergent communal relations through commensality, but not necessarily into how established communal relations function. Normative variations in the appropriateness of commensality between people belonging or not to the same groups (e.g., families, colleagues, friends; same-or-different gender, class, or ethnicity), constrain people's engagement in commensal situations, as well as shape the social meaning of those situations. Likewise, the effect of commensality on relations say, within families, probably depends on baseline social norms as well as on the increase or decrease of commensality within that family over time.

Importantly, our experimental setting involved participants interacting with each other, which implies that they not only perceived the same situation of sharing (or not) food from a common source with strangers, but also that their nonverbal behaviour could have been affected by the manipulations, thus mediating the effects of the manipulation on each other's perceptions of the ingroup. It is plausible that participants at the same time feel more disposed towards communalism, communicate that

disposition, project it onto others, and accurately perceive some of that disposition on the part of the other participants (Lemay & Clark, 2008). Further research is needed to separate the direct effects of commensality and the indirect effects of nonverbal behaviour in a commensal situation on the disposition for communalism.

As for the results showing no effects of commensality on ingroup favouritism, we also do not conclude that either commensality or communal sharing relations in general are unrelated to intergroup relations. We assume that although commensality is a universal human behaviour, cultural norms on who can eat or drink with whom, and on which food or drink is appropriate to share, place social limits on this behaviour and thus on its ability to produce communal sharing in groups. Replications of these experiments should therefore assume cultural variation in social barriers on commensality. Ethnic or class segregation may limit with whom people accept to share meals (Bailey, 2017). Food or drink taboos place even more stringent intergroup barriers on commensality. Understanding the social norms governing the limitations on commensality is therefore just as important as understanding the consequences of commensality. Conversely, when people feel offended by others' refusal to partake their food or drink, this can also contribute to intergroup tension. Finally, there is also wide scope for intergroup exclusion based on CS more generally. Deep-rooted communal groups (e.g., families) routinely favour their members in the distribution of resources. Whether this is a question of degree of communalism of a social relation or of other factors associated to those groups merits further examination.

However, following Fiske (1991) we would argue that ingroup favouritism and other aspects of intergroup relations can, under some conditions, be relatively

independent from intragroup relations people establish within the groups to which they belong, and many combinations of intra- and intergroup relations are possible.

More importantly, we would also argue that our studies show that, assuming no a priori social barriers, the act of sharing food and drink from the same source even with strangers has the potential to make people perceive and accept an emergent social bond. This can be readily applied to research on cohesion in small groups and should be useful for interventions designed to build community cohesion. At the same time, this emergent social bond does not produce an automatic effect on discrimination of other groups in resource distribution, which is good news for anyone interested in improving troubled intergroup relations. Understanding the conditions in which it does or does not have this effect should remain a priority for future research.

We started this paper by referring to the two main theoretical traditions in the social psychology of group formation and intergroup relations: the interdependence tradition and the identity tradition. Throughout the years, it has not always been clear why one approach should be adopted over the other. One answer has been that each is better suited to address different types of groups: the social identity approach for large-scale social categories such as gender, ethnicity, or ideology, and the interdependence approach for small groups or formal organizations (Wilder & Simon, 1998). Another answer has been that each of these focuses on a different aspect of group psychology, and the relation between these aspects is not predetermined: people can collectively produce a social identity inductively from their knowledge of the interactions of distinct individuals (interpersonal interdependence), or deductively from their representation of an underlying similarity of the group category (Postmes et al., 2005). The relational models approach that we adopt here suggests a third, complementary answer to each of

these: reciprocity, identity, and other similar concepts may simply refer to a variety of motivationally functional options that people have for creating social interactions and relations. Should this proposal of a process of relational-models based group formation turn out to be a robust phenomenon, it will be important to explore in future research how those relational dynamics interact with interdependence and identity-based group processes.

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Table 1

Experiment 1: Communal sharing and ingroup favouritism estimates by condition

	Commensality	Non-food sharing control	Non-sharing control
	EMM (SE)	*EMM (SE)*	*EMM (SE)*
Communal Sharing			
Prospective CS	0.09 (0.23)	-0.38 (0.23)	-0.03 (0.20)
Ingroup Warm/Nice	0.20 (0.23)	-0.55 (0.23)	-0.21 (0.20)
Self-group overlap	0.25 (0.23)	-0.35 (0.23)	-0.07 (0.20)
Attitude to ingroup	0.14 (0.23)	-0.41 (0.23)	-0.16 (0.20)
Behavior	0.23 (0.23)	-0.23 (0.23)	0.03 (0.20)
Ingroup Favouritism			
FAVonMJP	-0.27 (0.21)	0.63 (0.23)	-0.13 (0.19)
FAVonP	-0.32 (0.22)	0.87 (0.23)	-0.18 (0.19)
MDonMIP/MJP	-0.27 (0.26)	0.63 (0.28)	-0.18 (0.23)

Table 2

Experiment 2: Communal sharing and ingroup favouritism by condition

	Inclusive commensality *EMM (SE)*	Exclusive commensality *EMM (SE)*	Control *EMM (SE)*
Prospective CS	0.10 (0.18)	-0.09 (0.19)	0.06 (0.17)
Ingroup Warm/Nice	0.24 (0.18)	-0.05 (0.19)	-0.12 (0.17)
Self-group overlap	0.14 (0.18)	0.03 (0.19)	-0.08 (0.17)
Attitude to ingroup	0.24 (0.18)	-0.19 (0.19)	-0.07 (0.17)
Behaviour	0.39 (0.18)	0.01 (0.19)	-0.28 (0.17)
FAVonMJP	-0.15 (0.19)	0.10 (0.19)	0.03 (0.17)
FAVonP	-0.07 (0.18)	0.19 (0.19)	-0.05(0.17)
MDonMIP/MJP	-0.10 (0.21)	-0.07 (0.22)	0.07 (0.20)

Table 3

Experiment 3: Communal sharing and ingroup favouritism by condition

	Commensality with consubstantial assimilation	Commensality with equivalence	Simple Commensality	Control
	EMM (SE)	*EMM (SE)*	*EMM (SE)*	*EMM (SE)*
Prospective CS	0.17 (0.22)	-0.02 (0.24)	0.23 (0.22)	-0.58 (0.22)
Ingroup Warm/Nice	0.36 (0.22)	-0.16 (0.24)	0.04 (0.22)	-0.19 (0.22)
Self-group overlap	0.19 (0.22)	0.03 (0.24)	-0.22 (0.22)	0.07 (0.22)
Attitude to ingroup	0.35 (0.22)	0.03 (0.24)	-0.06 (0.22)	-0.21 (0.22)
Behaviour	0.31 (0.22)	-0.31 (0.24)	0.06 (0.22)	-0.10 (0.22)
FAVonP	0.07 (0.21)	-0.39 (0.23)	-0.07 (0.21)	0.11 (0.21)
FAVonMJP	0.19 (0.22)	-0.35 (0.24)	-0.27 (0.22)	0.18 (0.22)

Table 4

Experiment 4: Communal sharing and ingroup favouritism by condition

	Commensality with consubstantial assimilation	Commensality with equivalence	Common bottle control	Equivalent bottle control
	EMM (SE)	*EMM (SE)*	*EMM (SE)*	*EMM (SE)*
Prospective CS	0.49 (0.22)	-0.29 (0.22)	-0.79 (0.31)	-0.00 (0.24)
Ingroup Warm/Nice	0.29 (0.22)	-0.04 (0.22)	-0.52 (0.31)	-0.05 (0.24)
Self-group overlap	0.16 (0.22)	-0.05 (0.22)	-0.48 (0.31)	0.01 (0.24)
Attitude to ingroup	0.26 (0.22)	-0.11 (0.22)	-0.13 (0.31)	-0.31 (0.24)
Behaviour	0.19 (0.22)	0.18 (0.22)	-0.39 (0.31)	0.06 (0.24)
FAVonP	-0.13 (0.23)	0.15 (0.23)	-0.24 (0.32)	0.17 (0.25)
FAVonMJP	0.02 (0.23)	-0.05 (0.23)	0.04 (0.32)	0.01 (0.25)
MDonMIP/MJP	0.21 (0.23)	-0.04 (0.23)	-0.08 (0.32)	-0.32 (0.25)

Figure 1: Meta-analysis of experimental planned comparison effects on ingroup communalism (effect sizes and 95% CI for each experiment)

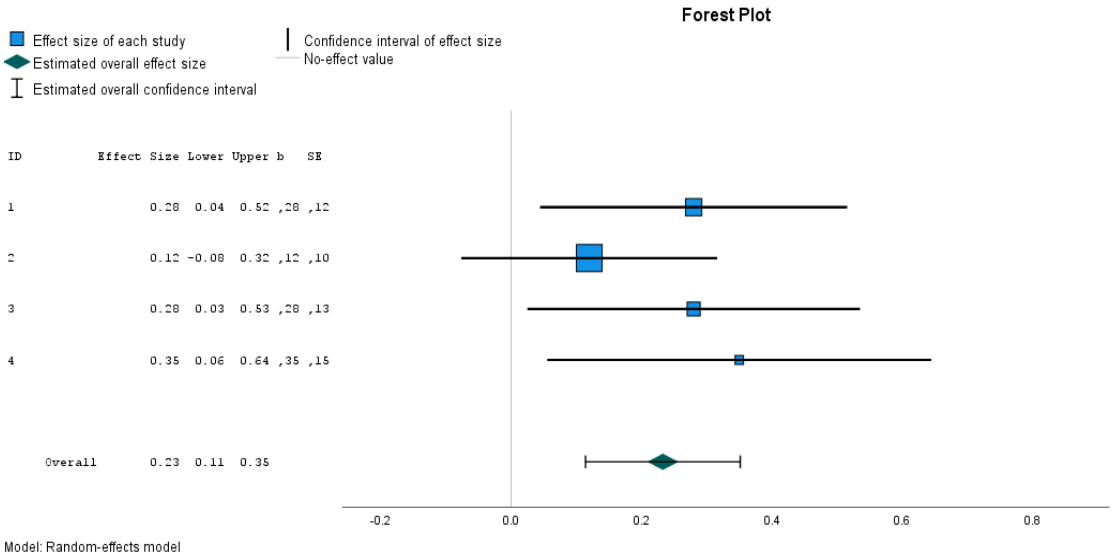

Figure 2: Meta-analysis of experimental planned comparison effects on ingroup favouritism (effect sizes and 95% CI for each experiment)