Journal of Psycholinguistic Research
https://doi.org/10.1007/s10936-019-09642-1

How Do Different Types of Alignment Affect Perceived Entity Status?

Tailer G. Ransom[1] · **Rick Dale**[2] · **Roger J. Kreuz**[3] · **Deborah Tollefsen**[1]

Abstract
Perceptions of entitativity are thought to be influenced by salient features such as the physical proximity and physical similarity of group members (Campbell in Behav Sci 3:14–25, 1958). But social interactions among group members involve a number of low-level alignment (Pickering and Garrod in Behav Brain Sci 27:212–225, 2004) and synchronization (Marsh et al. in Top Cogn Sci 1:320–339, 2009) processes. Conversational partners, for instance, become aligned in syntax, semantics, emotion, and bodily posture. In this paper, we explore whether alignment correlates with observers' judgments of entitativity, and, moreover, which specific forms of alignment have the strongest effects on these judgments. Results revealed that only emotional alignment had on effect on judgments of entitativity. We discuss how future work may further assess the role of various dimensions in shaping the perception of group status in linguistic interaction.

Keywords Entitativity · Alignment · Interaction · Affect · Social cognition

Introduction

The human ability to repeat patterns of intentional behavior seen among conspecifics may have been a critical survival trait (e.g., Tomasello 1998). Human interaction in particular involves behavioral synchronization (Marsh et al. 2009) and alignment (Pickering and Garrod 2004) in order for a coordinated action to be initiated and sustained. There is some evidence that mimicking basic behaviors of others is a nascent human capacity that even infants, at least to some extent, are capable of enacting (Gallagher and Meltzoff 1996; but see Oostenbroek et al. 2016). These synchronization and alignment processes can happen in a variety of ways, which involve both low-level 'surface' synchrony, dealing with basic behavioral tracking and matching, as well as higher-order, more cognitively rich 'deep' commitments, such as verbal agreements, deliberately

✉ Tailer G. Ransom
tgransom@memphis.edu

[1] Department of Philosophy, University of Memphis, Memphis, TN 38152, USA

[2] Department of Communication, University of California, Los Angeles, Los Angeles, CA, USA

[3] Department of Psychology, University of Memphis, Memphis, TN, USA

Published online: 08 April 2019

formulated goals and joint intentions. These different levels are not discrete and independent processes: high-level cognitive processes may influence the nature of the motor synchrony of the interactants. Likewise, surface synchrony may support fluid achievement of deep cognitive commitments (Tollefsen and Dale 2012). Though surely other mechanisms are critical to interaction, behavioral alignment is a key ingredient for engaging in joint, social activities (see Fusaroli et al. 2014; Delaherche et al. 2012).

One should expect, then, that when people observe interactions from a third-person perspective, the presence or absence of these subtle and rapid alignment processes should be correlated with the observer's judgment that this interaction is a unified social engagement (Garrod and Pickering 2004). Such a perception of unity may not always hold; perhaps some interactions are perceived as involving discrete partners, their behaviors a more contingent association among separate, disaggregate persons, acting primarily as individual agents. It has been shown that synchronization and alignment are highly associated with observers' attributions of rapport among interactants (Bernieri 1988; Bernieri et al. 1996). Considering the array of behaviors that have been identified as potentially in alignment during interaction—from bodily or voice patterns, to emotions and linguistics—it is an open question which of these behaviors, when aligned, support that perception of social unification. When seeing two interlocutors in vibrant interaction, which of these levels, when aligned, support the strongest perception of two people fusing into a well-knit, albeit temporary, social system?

In this paper, we explore whether alignment correlates with observers' judgments about the degree to which interactants form a cohesive social unit, and, moreover, which specific forms of alignment have the strongest effects on these judgments. These third-person attributions of social unity have been called *entitativity* (Lickel et al. 2000; Lickel et al. 2001). Entitativity deals with non-expert judgements of the extent to which individuals in a group are bonded together in some fashion. Though entitativity has been discussed in general terms (e.g., see Lickel et al. 2001), here we will we will describe entitativity in terms of alignment mechanisms. For instance, a group of professional dancers will likely be judged as having a very high level of entitativity, whereas a group of people waiting for a train on the same platform together will likely be judged as having a relatively low level of entitativity. Perceptual cues commonly correlated with observer entitativity attributions include (1) common goals, (2) similarity among group members, and (3) spatial proximity among group members (Campbell 1958).

Since entitativity is a scalar rather than binary concept, it works well as an operational measure of 'groupness'—groups are not qualified according to specific criteria and preconditions that they either fulfill or fail to fulfill. Judgments about entitativity could allow us to quantify to what extent interactants are perceived as social entities. By focusing our study on the concept of entitativity we can produce measurements of people's intuitions about the unity of interactions in order to demonstrate the effects of manipulating alignment variables. Whereas the alignment variables in the relevant literature deal with linguistic similarity and other cognitively sophisticated modes of alignment, we add a lower-level affective variable that might play a significant role in alignment processes. Affective alignment has been shown to be related to patterns of behavioral synchrony (e.g., Hove and Risen 2009). Emotional alignment has also been shown to be supportive of fruitful interactions (e.g., Main et al. 2016). What has not been explored is how these various aspects of alignment are more or less responsible for perception of two conversation partners as forming a cohesive unit. Here we design a narrative interpretation task that lets us compare the effects of alignment along these various dimensions.

We chose 4 dimensions to test for group entitativity. These dimensions were chosen to reflect a range of relevant variables to the domain of human linguistic interaction. The first we chose is *physical co-presence*. Co-presence is often hypothesized as a key feature of common ground and interaction (Clark 1996), and has also been implicated significantly in entitativity itself, since physical co-presence is a kind of physical similarity (e.g., Dasgupta et al. 1999). Henderson (2009) has also shown that physical co-presence has an implicit effect on the perception of common goals. Our second variable, as describe above, is the *affective* dimension—the extent to which emotional states are shared between interlocutors (e.g., Butler 2015). The next two dimensions were explicitly linguistic. When two individuals share words in common, they are sometimes said to have achieved a kind of conceptual pact (Brennan 1991; Brennan and Clark 1996). This may enhance the perception of group entitativity, because third-party observers may conceive of conversation partners as occupying a particular conceptual domain or space (e.g., Riordan et al. 2011). We call this the *lexical* dimension, in accord with linguistic terminology. Finally, considerable research has been conducted on the extent to which participants share structural features of language while they interact (for review see Branigan 2007). This *syntactic* alignment has been shown in picture description tasks (Bock 1986), but also in spontaneous interaction (Branigan et al. 2000). We included this as an additional linguistic dimension that may impact the perception of group entitativity.

Combining entitativity research with these ideas about human interaction has important theoretical implications. Social perception of groups, such as how tightly they are knit, likely have implications in the way we engage our social environs and make decisions about it. This perception may influence how we engage others, from a simple awareness of the social confluences, to assessing the potential to join or engage in cooperation with others. Researchers studying social interaction and language (e.g., Goodwin and LeBaron 2011; Louwerse et al. 2012; Pickering and Garrod 2004) have explored these issues, but our focus will be to what extent various aspects of social interaction—words, emotions, and so on—shape these entitativity perceptions. What factors drive our tendency to perceive interactants as a unified entity? In our study, participants were recruited through crowdsourcing to read short accounts of interactions between two people, and we systematically varied the manner in which the interlocutors in the story aligned.[1] We tested these four modes of alignment: spatial, affective, lexical and syntactic. We developed a series of dyadic interactions, in which these alignment features were either aligned or unaligned, in order to test third-person observers' intuitions about the degree of interactant entitativity. In this way, we investigated the differential effects that these modes of alignment had on the entitativity attributions for naïve participants.[2]

[1] Similar studies specifically designed to study alignment have been performed in previous research. Danescu-Niculescu-Mizil and Lee (2011) studied movie scripts, analyzing the linguistic alignment features that script writers implicitly chose to employ, depending on the situation between characters—hence, this is not the first experiment in which script-like vignettes have been used as a method for investigating alignment.

[2] Kaschak et al. (2011) have investigated structural priming for different syntactic structures to evaluate subjects' implicit alignment in terms of how they tended to mimic these syntactic structures when they filled in sentence stems in a post-bias test. Additionally, Reitter (2017) has analyzed linguisitic alignment tendencies within web-based dialogue in terms of the local syntactic regularities of different online communities. These findings, along with the Jaeger and Snider (2013) who analyze alignment in terms of entropy limitation and implicit learning about structural regularities of interaction in the environment, offer precedent for studying alignment in a textual medium and challenge Pickering and Garrod's (2004) notion that alignment is mechanistic, suggesting, instead that alignment may be a structural result of implicit learning. We remain agnostic about this debate, since our findings do not necessarily speak to this issue one way or

Experiment 1

Participants

Participants were recruited via Amazon Mechanical Turk (MTurk). They were required to have a Human Intelligence Task approval rate of 95% or higher. The study was only visible to workers in the United States. Sixty-seven participants (28 females; mean age = 33, SD = 8.8) requested taking the task, but we only received a full set of responses from 53 participants (see below). Participants received $2.00 for their participation (an average hourly rate of $4.65) for their participation, which took, on average, 25 min. Because an experiment precisely of this kind has not been run in the past, we had no strong basis for assessing effect size of these alignment types, and therefore statistical power. For our first study, we chose a sample size reflective of traditional within-subject psycholinguistics studies. This can be motivated by a simple power analysis of mean differences as a guide. If we assume that a simple paired-sample difference among our measures is moderate (e.g., Cohen's $d = 0.5$), then a sample size of 53 supplies an approximate power of 0.95 (paired differences, two-sided). Of course, power is much lower if we have small effects ($d = 0.2$, Power = 0.30), and obviously much better if the differences among alignment types is large ($d = 0.8$, Power = 0.99).[3]

Materials

The task consisted of a Qualtrics survey that contained 12 brief vignettes of interactions between two individuals (see "Appendix" section for a complete list of vignettes). There were two versions of each, and four conditions previously described: spatial, affective, lexical, and syntactic, in which the interlocutors were either aligned or nonaligned. The construction of these vignettes was informed by the previously mentioned research on alignment mechanisms. They were collaboratively written by the authors of this study, and edited in order to insure that the vignettes systematically manipulated the relevant alignment variables, and that these variables were manipulated in order to isolate the specific alignment feature in question. We chose vignettes for the purposes of our study because they could provide participants with concrete multivalent depictions of real life situations in which subjects would make entitativity judgments (c.f. Hughes and Huby 2004; Steiner et al. 2016). There is precedent for using vignettes in the evaluation of entitativity (c.f. Pereira and van Prooijen 2018) and textual vignettes that manipulate non-obvious variables (Thurston 2012). There is no extant literature that uses alignment mechanisms to test entativity judgments, thus we had to create vignettes that manipulated only the alignment variables, while keeping all other parameters of the interactants' relationships the same.

Footnote 2 (continued)
the other. However, this does potentially offer a theoretical framework in the alignment literature in terms of which these findings could be interpreted. Thanks to a reviewer for pointing this out.

[3] To carry out this calculation we used G*Power 3.1, under "Matched means" (paired), post hoc, with two-tailed probabilities and alpha 0.05. We thank an anonymous reviewer who encouraged us to consider power implications in this post hoc manner.

Spatial

In three interactions, spatial proximity of the interlocutors was manipulated. In the aligned condition, the interaction explicitly depicted the interlocutors as occupying close physical proximity as they talked to each other. In the unaligned condition, they did not occupy the same space, and conducted their conversation from a distance, either by phone or by e-mail. The content of the interlocutors' statements did not vary in the two versions.

Affective

In the aligned version of these three interactions, the interlocutors mirrored one another's emotional states. In the unaligned version, the interlocutors were described as having discrepant emotional states. Affective labels were not explicitly given (e.g., statements like, "*x* was happy," or, "*x* was annoyed"). Instead, the emotions were expressed by descriptions of behaviors unambiguously associated with emotional states. For example, "The florist nods in agreement," and "The florist sighs audibly and looks up with a forced smile".

Lexical

In the aligned version of these three interactions, the interlocutors mirrored each other's salient word choices in their conversation. In the unaligned version, the interlocutors used different words (e.g., "spear" for "javelin" and "ornament" for "jewel") although the words were approximately synonymous and expressed closely related semantic content.

Syntactic

In the aligned version of these three interactions, the interlocutors mirrored one another's syntax. For example, both parties referred to "the weapon the murderer used" in their interaction. In the unaligned version, the interlocutors used different syntactic structures from each other (e.g., "The alibi that the maid provided" vs. "The maid's alibi").

Procedure

These twelve vignettes were presented to each participant in random order. Participants were shown either the aligned or unaligned version of each, and saw each interaction only once. All participants were shown an equal number of aligned and unaligned interactions. After reading each interaction, they were asked to rate their agreement with six statements on a seven-point Likert scale. They were designed to elicit the participants' intuitions about entitativity and to track traits strongly associated with entitativity according to Lickel et al. (2000). The first two questions dealt with entitativity directly ("I feel that these individuals form a unified group" and "I would have a feeling of togetherness if I observed this conversation"). The third dealt with the fluency of the interaction ("I have the feeling that these individuals can work together"). The fourth dealt with similarity ("I feel like these individuals are like-minded"). A fifth dealt with shared goals ("I feel these people share goals"), and the last assessed positive feelings between the interactants ("I feel like these people like one another"). These scores were combined into a single entitativity score by averaging their responses. We had no specific hypotheses about each individual item, and only tested results of this overall entitativity score.

Possible Outcomes

A number of theoretical considerations guide predictions about the outcome of this study. Two in particular seem most suitable, and guided our initial design. Because we are testing the entity status of *conversation*, one possibility was that aligned linguistic elements, such as words and syntactic patterns, would show the strongest effect. One of the leading theories of interaction, interactive alignment (Pickering and Garrod 2004), predicts pervasiveness alignment across linguistic levels. For this reason, we might expect that perception of these levels aligning (lexical, syntactic) might induce a perception of group entitativity. The many demonstrations of word-based and phrase-based priming and alignment suggests that in perceiving an interaction, participants might weigh these variables most strongly (e.g., Bock 1986; Branigan et al. 2000; Brennan 1991; Brennan and Clark 1996; Riordan et al. 2011).

Another possibility is that co-presence and emotional valence between two people has a kind of core influence that might be far more salient to participants than more subtle linguistic variables. The role of emotion, for example, in shaping social relationships and the saliency of negatively valenced events may drive participants to notice such a misalignment (Butler 2015; Main et al. 2016). In addition, mere co-presence may be enough to perceive more groupness between two interacting individuals, since the environment may serve as a kind of environment that is shared and may influence the interlocutors jointly (Clark 1996). Variables that relate more strongly to physicality and physical similarity have been shown to relate to entitativity perception (Dasgupta et al. 1999; Lakens 2010), though prior work has shown that physical and other similarity and entitativity may have distinct effects, but are nevertheless related (Crump et al. 2010; Rutchick et al. 2008). So physical and emotional similarity here may have some relationship to perceived group status.[4]

Importantly, these hypotheses are not mutually exclusive, nor do we mean to suggest that physical co-presence and affective are intrinsically interconnected—it may indeed be, as we show below, that affect has a distinct impact on entitativity perception. These hypotheses simply guided the design of the task. The authors initially suspected that both of these conditions may hold—and that any divergence from alignment, regardless of the level, may lead to a perception of a breakdown of entitativity, to a lesser or greater degree. Importantly, however, the *relative* contribution of these levels may shed light on the perception of entitativity in conversation.

Results

We only included participants who supplied all 12 responses. Out of the 67 participants recruited, only 53 fully completed the task. These were retained for analysis and participants who did not supply all 12 responses were discarded. The reason for losing these subjects was likely due to attrition in the task. Some MTurk workers may have found it too time consuming, and did not supply a complete set of 12 responses.

As noted above, to test whether alignment had a general effect on participant entitativity responses, we constructed an entitativity score by averaging responses on all individual

[4] It is also important to note that physical distance may promote the perception of common goals in a group (Henderson 2009), which might suggest a negative relationship with entitativity (noting, importantly, that entitativity is not the same as having common goals).

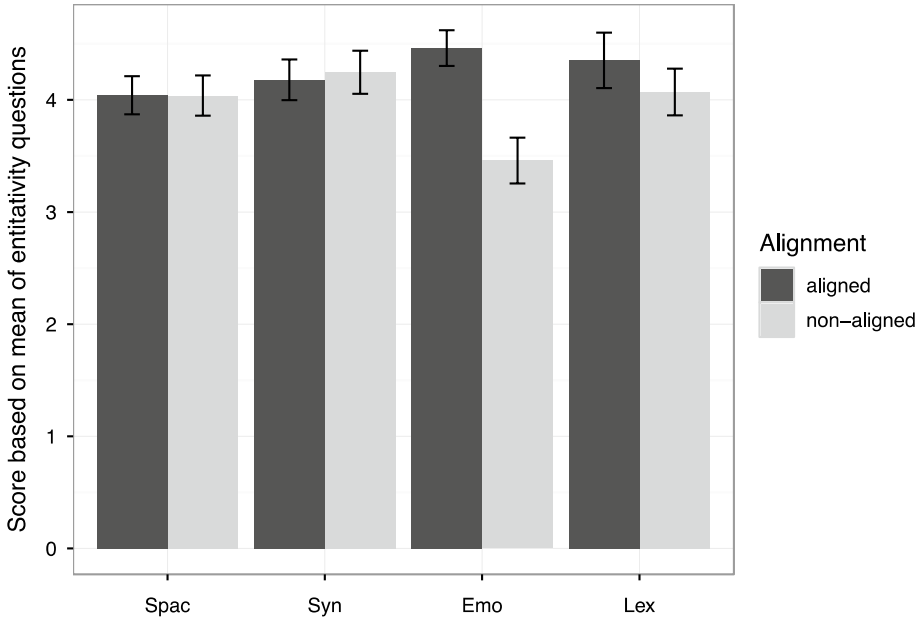

Fig. 1 Means by alignment and condition. Only emotional alignment shows disruption in mean entitativity score when characters in the vignette show a lack of alignment. Error bars are standard errors

items. This dependent measure was predicted using a linear model, with alignment and item type as factors. We used a linear mixed-effects model in R according to the guidelines specified by Barr et al. (2013). In a linear mixed-effects model, we control for subject and item variability by nesting a linear model for each level. This is referred to as a random-effect structure, and we maximized this random effect structure that successfully converged. All code and data can be found online.[5]

Interestingly, neither of our hypotheses was supported. In fact, all vignettes appeared to show a relatively high average entitativity ($M = 4$ or above), with the exception of the unaligned emotional vignettes. Only the vignettes with emotional variation showed an effect. This is expressed as a significant interaction, such that only affective vignettes showed a dampening of entitativity judgments when interlocutors in the vignette were not aligned ($t = 2.04$, $p = 0.041$). None of the other dimensions showed this difference (absolute t's < 1.2, p's > 0.2). Means are shown in Fig. 1, and full model results shown in Table 1.

In general, emotion appears to have the highest entitativity score, but this main effect did not hold. This significant interaction effect appears to be driven by the lack of alignment, rather than the presence of alignment, in the affective vignettes.

In a follow-up model exploring the locus of any such effects on entitativity, we built a linear mixed effects model predicting this perceived entitativity by alignment *within* each vignette type. As expected from the general analysis, affect is the only type of alignment that generates a difference in perceived entitativity of the interlocutors (Fig. 2).

[5] https://github.com/racdale/ransom-et-al-entitativity.

Table 1 Fixed effects for Experiment 1 of the lmer model

Factor	Estimate	SE	*t*	*p*
Intercept	3.98	0.35	11.27	0.00
Aligned (1 = yes)	0.12	0.25	0.46	0.65
Syntax (vs. spatial)	0.20	0.44	0.44	0.66
Affective (vs. spatial)	−0.44	0.46	−0.97	0.33
Lexical (vs. spatial)	0.06	0.45	0.15	0.88
Aligned × syntax	−0.03	0.35	−0.09	0.93
Aligned × affective	0.73	0.36	2.04	0.04
Aligned × lexical	0.20	0.35	0.58	0.56

Entitativity ~ alignment × type + (1 + type + alignmentlid) + (1 + alignmentlitemID)

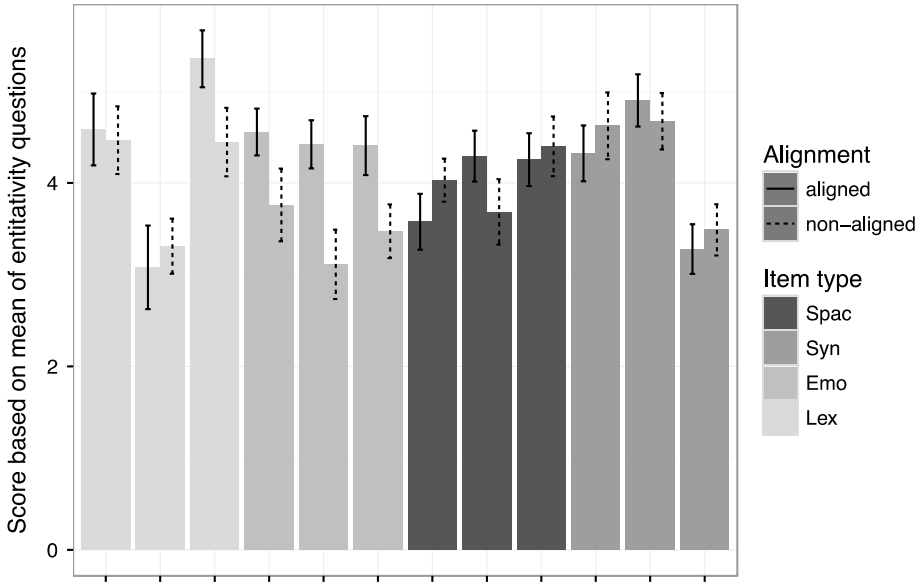

Fig. 2 All emotion vignettes show a consistent pattern such that non-alignment leads to a drop in the entitativity scores. The other items are mixed in their behavior when misalignment occurs. Error bars are standard errors

In fact, when plotting each item individually, we generally find great variability across all item types except for affective. The emotion vignettes all display a consistent drop in perceived entitativity in response to unaligned emotional states of the interlocutors.

Discussion

We were surprised to discover that only a perceived disruption in aligned affect led to a drop in entitativity scores. Participants did not perceive a break in lexical or syntactic structure to signal a disruption of the "entity status" of the interlocutors. Surprisingly, the spatial location of the interlocutors in the vignettes did not have a great impact either. We

wished to replicate these basic results, and carry out an additional check. We modified the response items by removing "I feel" before each, because this may have acted as a prompt to focus on the affective variable alone.

Experiment 2

Participants

Participants were again recruited via MTurk, using the same criteria as in Experiment 1. Seventy-seven participants (21 females; mean age = 35, SD = 8.9) received $2.00 for their participation (an average hourly rate of $4.97), which took, on average, 24 min. As Experiment 1, we only included participants who completed all responses. This left 72 participants for analysis. This sample size turned out to be more than 30% greater than that of Experiment 1, leading to improved power.

Materials

The same 24 interactions used in Experiment 1 were used in this study. In the entitativity items, we removed "I feel" before each, and simply used the declarative statement as the item to which participants responded by providing a rating.

Procedure

Participants completed the same task as in Experiment 1. As noted above, in order to control for the fact that response items may have prompted attention to the affective dimension, we repeated Experiment 1 with a new set of participants, changing only the voice of the statements that subjects rated. For example, instead of beginning the questions with "I feel," the participants were asked to make declarative, factual assessments ("These individuals form a unified group;" "I would have a sense of togetherness if I observed this conversation;" "I think that these individuals can work together;" "These people are like minded;" and These people share goals."). We also eliminated the final question because it explicitly mentioned the affective aspect of the interaction.

Results

Again, we constructed the dependent variable of entitativity scores from the mean response on the individual items. Key findings from Experiment 1 were replicated almost perfectly. The only observed effect of alignment was in the affective vignettes, showing a much more pronounced effect in this experiment. The interaction in the overall model is highly significant over the affective vignette types, $t = 7.3$, $p < 0.001$.

Again in follow-up analysis on individual item types, we find that affect is the only type that generates significant differences under alignment. These show almost the same result numerically: a lack of alignment along affective dimensions leads to a significant drop in perceived entitativity. Results are shown in Figs. 3 and 4. Full model results are shown in Table 2.

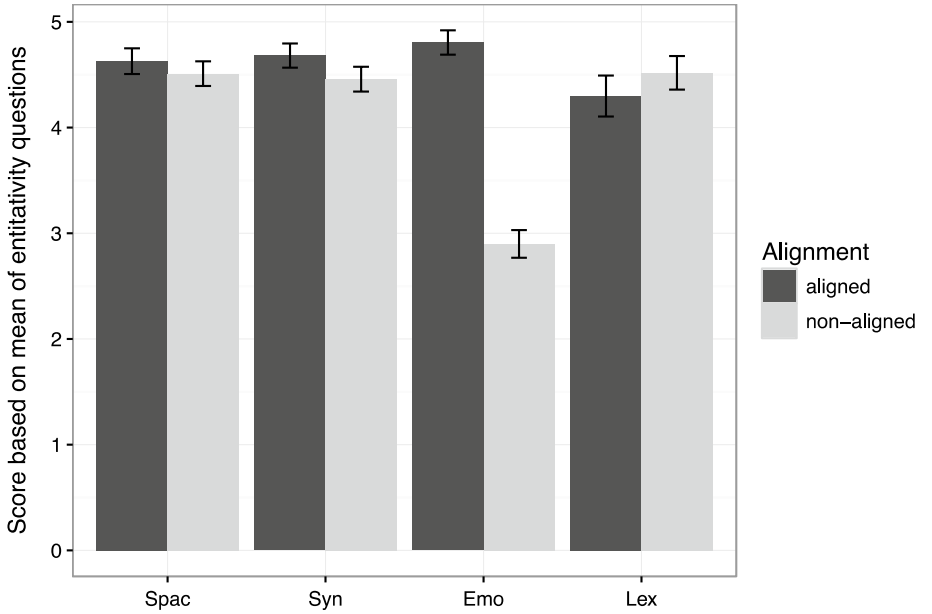

Fig. 3 The same results are seen in Experiment 2, with only a disruption in perceived entitativity when affect is misaligned. Error bars are standard errors computed as means divided by the square root of *N* defined for each bar mean

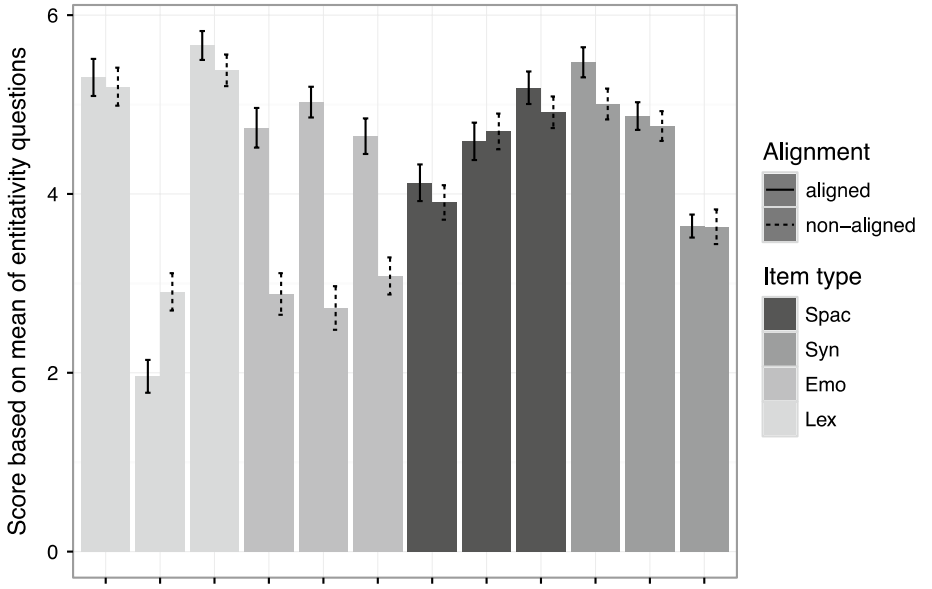

Fig. 4 As seen in Experiment 1, only the affective vignettes show a consistent drop in score. Some vignettes show high entitativity ratings; however on average affect is highest, given the consistency of perceived entitativity when affect aligns. In addition, other items along other dimensions behave inconsistently when these dimensions are misaligned in the vignettes. Error bars are standard errors

Table 2 Fixed effects for Experiment 2 of the lmer model

Factor	Estimate	SE	*t*	*p*
Intercept	4.58	0.65	7.07	< 0.00001
Aligned (1 = yes)	− 0.03	0.19	− 0.17	0.86
Syntax (vs. spatial)	0.03	0.91	0.03	0.98
Affective (vs. spatial)	0.25	0.90	0.28	0.78
Lexical (vs. spatial)	− 0.32	0.91	− 0.35	0.73
Aligned × syntax	− 0.05	0.26	− 0.20	0.84
Aligned × affective	− 1.93	0.26	− 7.34	< 0.00001
Aligned × lexical	0.29	0.26	1.12	0.26

Entitativity ~ alignment × type + (1 + type + alignment|id) + (1 + alignment|itemID)

Discussion

Experiment 2 exhibits almost the same pattern of results as Experiment 1, showing that the only consistent effects on perceived entity status are caused by affective items. This suggests that wording relating to feelings in the original experiment did not bias participants to favor only the affective dimension in making their judgments. We should also see this experiment as a close replication of the first experiment, rather than complementary evidence for this emerging pattern about affective alignment. In the next section, we discuss ways in which new complementary findings may be obtained through overcoming some of the limitations here.

General Discussion

Contrary to our expectations, misalignment along physical, lexical, and syntactic dimensions did not bring about a drop in perceived entitativity of interlocutors. When two individuals, for example, use different referential phrases, there does not appear to be a dip in the perceptions of these individuals as a coherent group. This surprised us given the wealth of evidence that individuals in such experiments agree upon "conceptual pacts" in formulating referential phrases in new domains (Brennan and Clark 1996). Instead, our items suggest that only affective alignment, when removed, leads to a drop in perceived groupness.

Although these findings might not be overtly surprising in comparison to the literature on alignment, which does account for the role of affect in many cases, these findings are surprising in comparison to the literature on entitativity. Campbell (1958) offers common fate, similarity, and proximity as the primary cues used by observers to make entitativity judgments. Studies of entitativity manipulate these parameters. Our studies also manipulate proximity and common fate and similarity, but in a more fine grained way. For instance, within Campbell's entitativity parameter of 'similarity', there are finer grained distinctions to be made between specific *kinds* of similarity. Our results suggest that entitativity judgments are sensitive to similarities in affect, whereas most of the literature on manipulating similarity focus on behavioral and superficial similarities such as shirt color (Brewer et al. 1995).

There are obvious limitations to these experiments that should be noted. For example, we did use a restricted set of vignettes. It is important to note that each dimension had three quite different scripts. Also, the striking consistency of the affective dimension convinces us that while more targeted modifications of the vignettes at the other levels may bring about our originally hypothesized effects (i.e., language first and physical first), they seem unlikely to carry as much weight as the affective dimension. This does not mean that the affective dimension lacks manifestation that would fail in the manner that our other vignettes did. Our results suggest in general, however, that entitativity is not a straightforward function of these levels. It is not the case that simple deviation from alignment leads to a perception of lost group entitativity *alone*. In the affective case, we might find similar failure in variants of the task. For example, pairs of people coordinating on a shared experience (e.g., a movie or other experience) may still be perceived as cohesive if there is an intention to engage in that experience together. It may be that the intentional structure has more impact on all of these variables, and the affective vignettes do appear to target this more sharply. Future manipulations of this kind may help tease apart these effects, and perhaps find the core effects that drive entitativity perception. For example, general *conversational flow* may be the prime variable that drives this, and all our vignettes may not have lacked a disruption of that level except for the affective dimensions (cf. Koudenburg et al. 2014). That flow feature may relate cognitively to more dynamic features of groups or entities *dynamically changing* together to achieve an end in a manner that is intentional or inferably intentional (as suggested by Lakens 2010; Rutchick et al. 2008).

One other limitation could be that the manipulation of affective parameters is perhaps an overly direct or artificial manipulation of the groupness of the situations. Perhaps the seeming impoliteness or lack of affective resonance between interactants manipulates some important component of the actual groupness, and thus these results may be question-begging. However, we suggest that this concern could also be interpreted in the service of our point: perhaps this speaks to the overt and common-sense salience of affective alignment in making entitativity judgments. And even when this alignment variable was manipulated, entitativity attributions did not disappear entirely. We would be more likely to give credence to this criticism if manipulating affect produced floor effects. After all, groups can operate efficiently and achieve goals together even if the group members don't necessarily like each other. In fact, this could point to further research on dyads who are engaged in a conflict or an argument to see which alignment variables affect entitativity judgments when there is already affective non-alignment between interactants.[6]

Another issue is that we used a set of items to get subjective judgments of perception of entity status. Other cognitive measures, more indirect or implicit, may be valuable for this purpose. As described at the outset of this paper, explicit perception of groupness may nevertheless be an important ingredient of social experience and decision making. The robust influence of affect on perceived entity status suggests that there could be something important about affective or emotional alignment during interaction that supports the status of two persons to be operating as one entity. It may serve as a stronger cue for a breakdown of intention and shared goals in interaction.

These remarks about intention and effect, in fact, suggest future directions to further test the other levels of alignment. For example, in a task that specifically requires certain conceptual pacts, a divergence at the lexical or phrase level may reveal a failure to align

[6] We would like to thank our reviewer for bringing this limitation to our attention.

in goals or intention (e.g., Brennan and Clark 1996). This may lead to a diminished entitativity perception. As some recent prior work suggests (e.g., Henderson 2009), physical co-presence may operate more subtly. In this work, physical distance, when increased, may lead to a greater perception of goal coordination, since that is required for successful interaction at such a distance. These findings suggest that the physical co-presence variable is more subtle than we expected—perception again weaving this variable into the intentional structure, such as highlighting physically shared artifacts that are intentionally or functionally relevant to the task, could be used to induce the drop in entitativity.

The physical variable may be better explored with embodied or pictorial representations of the vignettes or some other stimuli. Linguistic descriptions in the narrative may not have the force of perceptual organization seen in other studies on entitativity (e.g., Lakens 2010). Future work may improve the physical co-presence feature by using pictorial representations in a manner used in other psycholinguistics experiments (e.g., picture description tasks: Bock 1986). However, we leave it an open possibility that in a linguistic task, such as conversation, physical co-presence need not be a buttress to goal or intention sharing. It may be interesting, akin to Henderson (2009), to find that human perception of groups in complex tasks like interaction may involve abstracted conceptions that go above physical or other perceptual features.

Despite these limitations and need for future exploration, our modest effects do motivate some general thoughts. Many extant theories of joint action and interaction may predict relatively high levels of perceived entitativity among the interactants in our vignettes, given physical co-presence and the implication of community membership (e.g., Clark 1996; Pickering and Garrod 2004). And indeed, in Figs. 1 and 3, we see that *all* dimensions have relatively high entitativity means, except the affect dimension when misaligned. Recent evidence on conversational flow and entitativity suggests that if flow is not disrupted there may be a perception of entitativity; perhaps the affective levels most strongly signals that disruption (Koudenburg et al. 2014).[7] Participants do not perceive a misalignment of word forms or phrases, or even physical co-presence, as a critical ingredient to a disrupted group status. This suggests that the affective dimension can override entitativity status created by shared common ground.

Our studies demonstrate that disrupting affect in an interaction seemed to serve as a signal to participants that the vignette involved some breakdown in communication. Two persons may use quite different words or phrases during their interaction—and they may occupy quite different physical locations—but if their emotional states exhibit some misalignment, participants perceive them as being more independent, and less unified. This may recommend a strongly *functional* rather than *structural* perception of entitativity in human interaction. It may be that structural features of interaction are free to vary, provided that the function and intention of these conversations proceed apace. When emotion is disrupted, it may signal individuation of these interacting individuals. Given the central role of emotion found in other work, such as the role of affect in influencing close relationships (Jacobson et al. 1994), perhaps our results should not surprise. The approach we take nevertheless demonstrates that even in text-based vignettes, these affective constraints may still hold.

[7] Though it is outside the scope of the current discussion, it is important to note that Koudenburg et al. (2014) found that this entitativity perception interacted with social status of a group, and that flow itself may not be a simple function of entitativity either.

Acknowledgements Parts of this Project emerged as a consequence of funding from a Human Social Dynamics award funded by NSF BCS-0826825 to the co-authors. This Project was also funded, in part, by a Grant from the Institute of Intelligent Systems at the University of Memphis.

Appendix

Syntactic 1: Aligned

Carol has accepted an invitation to attend a murder mystery party being thrown by a coworker.
Even though she doesn't know any of the others who will be present, she thinks it might be fun.
The game begins with the reading of clues taken from a deck of cards.
A woman named Janet draws a card and reports, "The weapon the murderer used is hidden in the bookcase."
Carol responds, "That means the weapon the murderer used must be small—it's a tiny bookcase!"
Later in the game, Carol draws a card and announces, "The alibi the maid provided the detective isn't true."
Janet, who's been skeptical about the maid from the beginning, blurts out "I knew the alibi the maid provided was suspicious! I just knew it!"
One by one, the murder suspects are cleared until only one remains.
The final suspect admits to being the killer, and the party starts to break up.
As Carol is walking to her car, she remarks to Janet, "The confession the murderer gave was a nice bit of acting."
Janet replies, "Yeah, the confession the murderer gave was chilling—he should be in the theater instead of coaching his kid's soccer team!"

Syntactic 2: Non-aligned

Carol has accepted an invitation to attend a murder mystery party being thrown by a coworker.
Even though she doesn't know any of the others who will be present, she thinks it might be fun.
The game begins with the reading of clues taken from a deck of cards.
A woman named Janet draws a card and reports, "The murder weapon is hidden in the bookcase."
Carol responds, "That means the weapon the murderer used must be small—it's a tiny bookcase!"
Later in the game, Carol draws a card and announces, "The alibi the maid provided the detective isn't true."
Janet, who's been skeptical about the maid from the beginning, blurts out "I knew the maid's alibi was suspicious! I just knew it!"
One by one, the murder suspects are cleared until only one remains.
The final suspect admits to being the killer, and the party starts to break up.

As Carol is walking to her car, she remarks to Janet, "The confession the murderer gave was a nice bit of acting."
Janet replies, "Yeah, the murderer's confession was chilling—he should be in the theater instead of coaching his kid's soccer team!"

Syntactic 2: Aligned

John, a small business owner, has been chosen for jury duty, and reports to the court early in the morning.
As he waits to go through a security checkpoint, he strikes up a conversation with the guard.
John asks "Does anyone ever bring anything dangerous to the court?"
The guard replies, "You wouldn't believe it! Just last week, a guy brought a switchblade into the building!"
Surprised, John repeats, "Someone brought a switchblade into the building?".
"Yeah! Isn't that crazy? And don't get me started on the number of pocket knives we've had to confiscate."
"Well, at least people understand that they can't bring handguns to the court," John replies.
"Oh no! People bring handguns to the court all the time! People assume that if they have a permit to carry, they can take their guns anywhere."
Now John is really shocked. "Well, it's clear to me why you have to have a checkpoint! People do crazy things when they're upset."
"People do crazy things all the time," the guard agrees.
John makes his way through the metal detector and into the jury waiting room.

Syntactic 2: Non-aligned

John, a small business owner, has been chosen for jury duty, and reports to the court early in the morning.
As he waits to go through a security checkpoint, he strikes up a conversation with the guard.
John asks "Does anyone ever bring anything dangerous to the court?"
The guard replies, "You wouldn't believe it! Just last week, a guy brought a switchblade into the building!"
Surprised, John repeats, "A switchblade was brought into the building?".
"Yeah! Isn't that crazy? And don't get me started on the number of pocket knives we've had to confiscate."
"Well, at least people understand that they can't bring handguns to the court," John replies.
"Oh no! Handguns are brought to the court all the time! People assume that if they have a permit to carry, they can take their guns anywhere."
Now John is really shocked. "Well, it's clear to me why you have to have a checkpoint! People do crazy things when they're upset."
"Crazy things are done by people all the time," the guard agrees.
John makes his way through the metal detector and into the jury waiting room.

Syntactic 3: Aligned

Alice, a college sophomore, has an appointment to meet with her new advisor, because she's changed her major from elementary education to sociology.
The advisor, a tall bearded man wearing a coat and tie, invites her to take a seat.
"I'm hoping the classes I've already taken will transfer," she begins hopefully.
"The classes you've already taken will transfer for the most part," the advisor agrees. "However, the archery class on the electives list in education won't count toward your degree in the social sciences."
Alice finds this confusing. "Won't the archery class on the electives list count toward my general education requirements?"
"It used to," the advisor agrees, "but the catalog you'll graduate under no longer allows any physical education credits."
Alice's heart sinks a little. "The catalog I'll graduate under also won't allow me to count my classroom internship, correct?"
"That's right," says the advisor. "Unfortunately, that's what happens when you not only change your major, but your college as well. Everything else appears to be in good shape, though."

Syntactic 3: Non-aligned

Alice, a college sophomore, has an appointment to meet with her new advisor, because she's changed her major from elementary education to sociology.
The advisor, a tall bearded man wearing a coat and tie, invites her to take a seat.
"I'm hoping the classes I've already taken will transfer," she begins hopefully.
"The classes that you've already taken will transfer for the most part," the advisor agrees. "However, the archery class that's on the electives list in education won't count toward your degree in the social sciences."
Alice finds this confusing. "Won't the archery class on the electives list count toward my general education requirements?"
"It used to," the advisor agrees, "but the catalog that you'll graduate under no longer allows any physical education credits."
Alice's heart sinks a little. "The catalog I'll graduate under also won't allow me to count my classroom internship, correct?"
"That's right," says the advisor. "Unfortunately, that's what happens when you not only change your major, but your college as well. Everything else appears to be in good shape, though."

Affective 1: Aligned

Customer enters the front door and walks toward the florist who is arranging flowers in a vase.
The florist looks up from her work and asks, "Can I help you?"
"I need to send some flowers to my aunt. My uncle just passed away." The customer replies.
"Sorry to hear that your uncle passed away," The florist says with a worried look on his face, and then smiles as he says "I am happy you need some flowers, however."

"Yes…well, I want something really spectacular. My uncle was such a great guy and I feel awful for my aunt who will be alone now."
The florist nods in agreement, "Mmmm…I see. Would you like roses or a seasonal mix?"
"Oh, I don't know. Honestly, I am at a total loss here. What do people usually send?"
The florist pats the customer's hand gently and replies, "Oh, don't you worry. I will make up a beautiful bouquet and send them out immediately. I just need your information."

Affective 1: Non-aligned

Customer enters the front door and walks toward the florist who is arranging flowers in a vase.
The florist, without looking up from his arrangement, abruptly asks, "Can I help you?"
The customer replies, "I need to send some flowers to my aunt. My uncle just passed away."
"Sorry to hear that your uncle passed away." He says keeping his eyes on his work. He chuckles and adds, "I am happy you need some flowers, however."
"Yes…well, I want something really spectacular. My uncle was such a great guy and I feel awful for my aunt who will be alone now."
The florist looks at the customer and then down at his watch. "Mmmm…I see. Would you like roses or a seasonal mix?"
The customer replies, "Oh, I don't know. Honestly, I am at a total loss here. What do people usually send?"
The florist sighs audibly, and then looks up with a forced smile, "Oh, don't you worry. I will make up a beautiful bouquet and send them out immediately. I just need your information."
"Okay."
Customer provides information.

Affective 2: Aligned

A patron enters the neighborhood library and approaches the librarian behind the desk. The following exchange occurs.
The librarian smiles as the patron approaches and asks, "Can I help you?"
The patron says, "I am looking for the new bestseller by Stephan King. I just read a review of it in the New Yorks Times and it sounds fabulous."
Librarian nods knowingly and remarks, "Yes, it is a popular book," but then, with an apologetic smile, she says, "I'm afraid we don't have any copies available at this time."
"Oh, shucks, I was really hoping to avoid having to purchase the book."
The librarian holds up a finger to keep the customer from sulking away, "Well, we do have a waitlist. I can add your name to it and when a copy becomes available we can email you."
"That would be great. How long do you think it will be until another copy becomes available?"
The librarian types deliberately on her computer, searching through the databases. She finally looks up and says, "Let me see…ah…there are three people ahead of you. The

library owns three copies and they are all due back within the week. We should be able to get you a copy next week. Assuming they are returned on time."
"Wonderful. Thanks for your help!"

Affective 2: Non-aligned

A patron enters the neighborhood library and approaches the librarian behind the desk. The following exchange occurs:
Without looking up from her book, the librarian asks, "Can I help you?"
The patron replies, "I am looking for the new bestseller by Stephen King. I just read a review of it in the New York Times and it sounds fabulous."
The librarian chuckles, "Yes, it is a popular book," she remarks still without looking up from her book, "I'm afraid we don't have any copies available at this time."
"Oh, shucks, I was really hoping to avoid having to purchase the book."
The librarian sets her book down with a thud and says, "Well, we do have a waitlist. I can add your name to it and when a copy becomes available we can email you."
"That would be great," the parton says, "How long do you think it will be until another copy becomes available?"
The librarian rolls her eyes, sighs and swivels her chair toward the computer. "Let me see…ah…there are three people ahead of you. The library owns three copies and they are all due back within the week. We should be able to get you a copy next week." She turns back to her book and, under her breath, adds "Assuming they are returned on time."
"Wonderful. Thanks for your help!"

Affective 3: Aligned

A doctor and patient are in the examination room. The following conversation takes place:
The doctor comes in reading a chart. He stops, looks up at the patient and asks, "How long have you had the rash on your ribs?"
"About 3 weeks." The patient replies.
The doctor nods, without breaking eye contact and asks, "Does it itch?"
"Sometimes, but not really. It feels more like a burn than an itch."
"Does this hurt?" The doctor asks as he places his hand on the area of the rash and gently prods.
"Yes," The patient says, wincing.
The doctor smiles apologetically and says, "Ok, I think you've got shingles. I will write you a prescription."

Affective 3: Non-aligned

A doctor and patient are in the examination room. The following conversation takes place:
The doctor comes into the room reading a chart and, without looking up, asks, "How long have you had the rash on your ribs?"
"About 3 weeks," the patient replies.

The doctor keeps his eyes fixed on the chart and begins to write something. "Does it itch?" he asks.
"Sometimes, but not really. It feels more like a burn than an itch."
"Does this hurt?" The doctor asks, prodding the area of the rash with his fingers.
"Yes," the patient says, wincing.
The doctor looks back down at the chart and yawns. He writes something else and then abruptly states, "Ok, I think you've got shingles. I will write you a prescription."

Lexical 1: Aligned

Two strangers walk into the same exhibit room in a museum, and begin discussing a new exhibit on human artifacts from the stone ages. The objects are interesting, but their purpose is difficult to figure out, and so they engage in an interesting conversation comparing and contrasting the objects.
"This long one, that looks like a spear, it could be a weapon," the first stranger notes to the other stranger about one of them.
The second stranger tilts his head pondering, and notes "Yeah, that spear one does look like a weapon, but this blunt spherical one could be thrown too."
"Indeed," the first person agrees, "yup the sphere looks pretty dangerous. I'd not want to be on the receiving end of that."
They both laugh, realizing that they have interpreted all the items so far as weapons, so he chimes in again "Well, the spherical one may have been a cave ornament."
The other stranger laughs too: "Yes, an ornament, that's it!"

Lexical 1: Non-aligned

Two strangers wander into the same exhibit room in a museum, and begin discussing a new exhibit on human artifacts from the stone ages. The objects are interesting, but their purpose is difficult to figure out, and so they engage in an interesting conversation comparing and contrasting the objects.
"This long one, that looks like a spear, it could be a weapon," he notes to the first stranger about one of them.
The second stranger tilts his head pondering, and notes "Yeah, that javelin one does look like a weapon, but this blunt spherical one could be thrown too."
"Indeed," The first person agrees, "yup the ball looks pretty dangerous. I'd not want to be on the receiving end of that."
They both laugh, realizing they had interpreted all the items so far as weapons, so he chimes in again "Well, the spherical one may have been a cave ornament."
The other stranger laughs too: "Yes, a cave decoration, that's it.

Lexical 2: Aligned

Two strangers strike up a conversation in a shop. They are comparing pants, and the first person becomes amused at how intensely his new acquaintance seems to be evaluating the pants. He chuckles and participates in the venture.
"The sequin pants are hilarious," the second person notes, "and they would win you much attention at work, wouldn't they?"

"The sequin pants, yeah," the first person agrees, "they glimmer and draw the eyes, but how about these faux-ripped pants?"
The second person jumps up in excitement, "Faux-ripped pants! Yes, these are great if you want to intimidate your co-workers, but they are not as imposing as these skinny skinny skinny jeans."
"Wow, indeed. Those skinny skinny skinny jeans are imposing indeed! Watch out!"
"Well," the second person concludes, "let's just go for some plain blue jeans and call it a day."
"Plain blues are a safe bet," the first person notes, glad to be at the conclusion of the search.

Lexical 2: Non-aligned

Two strangers strike up a conversation in a shop. They are comparing pants, and the first person becomes amused at how intensely his new acquaintance seems to be evaluating the pants. He chuckles and participates in the venture.
"The sequin pants are hilarious," the second person notes, "and they would win you much attention at work, wouldn't they?"
"The shiny pants, yeah," the first person agrees, "they glimmer and draw the eyes, but how about these faux-ripped pants?"
The second person jumps up in excitement, "Fake-wreck pants! Yes, these are great if you want to intimidate your co-workers, but they are not as imposing as these skinny skinny skinny jeans."
"Wow, indeed. Those thin thin thin jeans are imposing indeed! Watch out!"
"Well," his the second person concludes, "let's just go for some plain blue jeans and call it a day."
"Regulars are a safe bet," the first person notes, glad to be at the conclusion of the search.

Lexical 3: Aligned

A woman is wandering in an art gallery and observes a tour guide giving a personalized tour to one patron. The patron seems to be quite wealthy. They begin to discuss the modern paintings in the room.
"This red stripe is indicative of fury, anger over social injustice," the tour guide remarks about the abstract painting.
"But is it worth a million? The red stripe one just seems overly simple, despite what you say about its meaning," the wealthy patron notes.
"Okay, the tour guide notes, it is perhaps simplistic, but this other one, here, may look like a splotchy mess, but it is quite complex and care has been put—" the guide notes, but is interrupted.
"I don't care for the splotchy one either. It looks like a lazy mess that a dog or cat produced while covered in paint over a canvas. How much is this one with elegant wavy formations?"
The tour guide smiles "Ah, each wavy formation is an expression of the artist's emotional trauma and the venture in overcoming it."
The patron sighs, and asks "Did you just make that up right now?"

Lexical 3: Non-aligned

A woman is wandering in an art gallery and observes a tour guide giving a personalized tour to one patron. The patron seems to be quite wealthy. They begin to discuss the modern paintings in the room.
"This red stripe is indicative of fury, anger over social injustice," the tour guide remarks about the abstract painting.
"But is it worth a million? The scarlet line one just seems overly simple, despite what you say about its meaning," the wealthy patron notes.
"Okay, the tour guide notes, it is perhaps simplistic, but this other one, here, may look like a splotchy mess, but it is quite complex and care has been put—" the guide notes, but is interrupted.
"I don't care for the patchy one either. It looks like a lazy mess that a dog or cat produced while covered in paint over a canvas. How much is this one with elegant wavy formations?"
The tour guide smiles "Ah, each ripple pattern is an expression of the artist's emotional trauma and the venture in overcoming it."

Spatial 1: Aligned

A bewildered student makes his way down the hall and approaches the open door of his professor's office.
He starts, "Hello Professor, I'm afraid that I've fallen a little bit behind with my work due to illness and I was wondering if you could give me an extension on the assignment that's due tomorrow."
"If I'm not mistaken, this is the third extension that you have requested this semester," the professor responds, "Our class policy dictates that I can't give you another extension unless you have a doctor's note."
"I understand. I can bring a note to you tomorrow during your office hours."
"Yes, that should be fine then. I'll look forward to seeing you tomorrow."

Spatial 1: Non-aligned

A bewildered student sits alone in his room, and as he's drafting an email to his professor he notices that she appears to be available on Google chat, and so he starts a conversation.
He starts, "Hello Professor, I'm afraid that I've fallen a little bit behind with my work due to illness and I was wondering if you could give me an extension on the assignment that's due tomorrow."
"If I'm not mistaken, this is the third extension that you have requested this semester," the professor responds, "Our class policy dictates that I can't give you another extension unless you have a doctor's note."
"I understand. I can bring a note to you tomorrow during your office hours."
"Yes, that should be fine then. I'll look forward to seeing you tomorrow."

Spatial 2: Aligned

A customer approaches a customer service desk with her copy of a book that she had purchased the week before in hand.
She says to the attendant, "Hello, I bought a copy of the wrong book last week. I meant to get the third installment of this series, but it turns out that this is the forth one."
"Not a problem, Ma'am. Do you still have the receipt for your purchase?"
"I don't, but the sticker with the bar code is still on the back cover."
"Well, that's fine," The attendant replies, "Would you like to exchange this for store credit, or would you just like to trade it in for the third book?"
"I think I'd prefer store credit." The woman replies.
"Alright, we will provide you with a gift card that can be used for further purchases."

Spatial 2: Non-aligned

A customer calls a customer service hotline with a copy of the book that she had ordered a week before in hand. The phone rings twice before she hears the voice of the attendant.
She says, "Hello, I bought a copy of the wrong book last week. I meant to get the third installment of this series, but it turns out that this is the forth one."
"Not a problem, Ma'am. Do you still have the receipt for your purchase?"
"I don't, but the sticker with the bar code is still on the back cover.
"Well, that's fine," The attendant replies, "Would you like to exchange this for store credit, or would you just like to trade it in for the third book?"
"I think I'd prefer store credit." The woman replies.
"Alright, we will provide you with a gift card that can be used for further purchases."
"Thank you!"

Spatial 3: Aligned

A man picks up his phone and calls the Memphis Police Department.
The officer on duty picks up the phone and says, "Hello, sir. How can I help you?"
The man replies, "Well, I'd like to make a report of a missing bicycle."
"Could you describe the missing bike?"
"Yes, it was a blue Schwinn; a late 90 s model."
"Well, that's a shame," the officer says, "I used to have one of those. They're great bikes."
"Yes, they are."
"Well, if drive around to the back side of the station I can have somebody take you through the recovered property shed."
"Thank you, Officer."

Spatial 3: Non-aligned

A man walks into the Memphis Police Department and approaches the desk of the officer on duty.

The officer looks up and says, "Hello, sir. How can I help you?"
The man replies, "Well, I'd like to make a report of a missing bicycle."
"Could you describe the missing bike?"
"Yes, it was a blue Schwinn; a late 90 s model."
"Well, that's a shame," the officer says, "I used to have one of those. They're great bikes."
"Yes, they are."
"Well, if drive around to the back side of the station I can have somebody take you through the recovered property shed."
"Thank you, Officer."

Questions Used to Investigate Entitativty Attributions (Agreement Rated on Five-Point Likert Scale)

These individuals form a unified group.
I would have a sense of togetherness if I observed this conversation.
Think that these individuals can work together.
These people are like minded.
These people share goals.
These people seem to like each other.

References

Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effect structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language, 68*(3), 255–278.

Bernieri, F. J. (1988). Coordinated movement and rapport in teacher–student interactions. *Journal of Nonverbal Behavior, 12,* 120–138.

Bernieri, F. J., Gillis, J. S., Davis, J. M., & Grahe, J. E. (1996). Dyad rapport and the accuracy of its judgment across situations: A lens model analysis. *Journal of Personality and Social Psychology, 71,* 110–129.

Bock, J. K. (1986). Syntactic persistence in language production. *Cognitive Psychology, 18*(3), 355–387.

Branigan, H. P. (2007). Syntactic priming. *Language and Linguistics Compass, 1*(1–2), 1–16.

Branigan, H. P., Pickering, M. J., & Cleland, A. A. (2000). Syntactic co-ordination in dialogue. *Cognition, 75,* B13–B25.

Brennan, S. E. (1991). Conversation with and through computers. *User Modeling and User-Adopted Interaction, 1,* 67–86.

Brennan, S. E., & Clark, H. H. (1996). Conceptual pacts and lexical choice in conversation. *Journal of Experimental Psychology. Learning, Memory, and Cognition, 22,* 1482–1493.

Brewer, M. B., Weber, J. G., & Carini, B. (1995). Person memory in intergroup contexts: Categorization versus individuation. *Journal of Personality and Social Psychology, 69,* 29–40.

Butler, E. A. (2015). Interpersonal affect dynamics: It takes two (and time) to tango. *Emotion Review, 7,* 336–341.

Campbell, D. T. (1958). Common fate, similarity, and other indices of the status of aggregate persons as social entities. *Behavioral Science, 3,* 14–25.

Clark, H. H. (1996). *Using language*. Cambridge: Cambridge University Press.

Crump, S. A., Hamilton, D. L., Sherman, S. J., Lickel, B., & Thakkar, V. (2010). Group entitativity and similarity: Their differing patterns in perceptions of groups. *European Journal of Social Psychology, 40*(7), 1212–1230.

Danescu-Niculescu-Mizil, C., & Lee, L. (2011). Chameleons in imagined conversations: A new approach to understanding coordination of linguistic style in dialogs. In *Proceedings of the 2nd workshop on cognitive modeling and computational linguistics* (pp. 76–87). New York: Association for Computational Linguistics.

Dasgupta, N., Banaji, M. R., & Abelson, R. P. (1999). Group entitativity and group perception: Associations between physical features and psychological judgment. *Journal of Personality and Social Psychology, 77*(5), 991.

Delaherche, E., Chetouani, M., Mahdhaoui, A., Saint-Georges, C., Viaux, S., & Cohen, D. (2012). Interpersonal synchrony: A survey of evaluation methods across disciplines. *Affective Computing, IEEE Transactions on, 3,* 349–365.

Fusaroli, R., Konvalinka, I., & Wallot, S. (2014). Analyzing social interactions: The promises and challenges of using cross recurrence quantification analysis. In N. Marwan, et al. (Eds.), *Translational recurrences* (pp. 137–155). Cham: Springer.

Gallagher, S., & Meltzoff, A. N. (1996). The earliest sense of self and others: Merleau-Ponty and recent development studies. *Philosophical Psychology, 9,* 211–233.

Garrod, S., & Pickering, M. J. (2004). Why is conversation so easy. *Trends in Cognitive Science, 8,* 8–11.

Goodwin, C., & LeBaron, C. (2011). *Embodied interaction: Language and body in the material world* (Vol. 8). Cambridge: Cambridge University Press.

Henderson, M. D. (2009). Psychological distance and group judgments: The effect of physical distance on beliefs about common goals. *Personality and Social Psychology Bulletin, 35*(10), 1330–1341.

Hove, M. J., & Risen, J. L. (2009). It's all in the timing: Interpersonal synchrony increases affiliation. *Social Cognition, 27*(6), 949.

Hughes, R., & Huby, M. (2004). The construction and interpretation of vignettes in social research. *Social Work and Social Sciences Review, 11*(1), 36–51.

Jacobson, N. S., Gottman, J. M., Waltz, J., Rushe, R., Babcock, J., & Holtzworth Munroe, A. (1994). Affect, verbal content, and psychophysiology in the arguments of couples with a violent husband. *Journal of Consulting and Clinical Psychology, 62,* 982–988.

Jaeger, T. F., & Snider, N. E. (2013). Alignment as a consequence of expectation adaptation: Syntactic priming is affected by the prime's prediction error given both prior and recent experience. *Cognition, 127*(1), 57–83.

Kaschak, M. P., Kutta, T. J., & Jones, J. L. (2011). Structural priming as implicit learning: Cumulative priming effects and individual differences. *Psychonomic Bulletin and Review, 18,* 1133. https://doi.org/10.3758/s13423-011-0157-y.

Koudenburg, N., Postmes, T., & Gordijn, E. H. (2014). Conversational flow and entitativity: The role of status. *British Journal of Social Psychology, 53*(2), 350–366.

Lakens, D. (2010). Movement synchrony and perceived entitativity. *Journal of Experimental Social Psychology, 46*(5), 701–708.

Lickel, B., Hamilton, D. L., & Sherman, S. J. (2001). Elements of a lay theory of groups: Types of groups, relational styles, and the perception of group entitativity. *Personality and Social Psychology Review, 5,* 129–140.

Lickel, B., Hamilton, D. L., Wieczorkowska, G., Lewis, A., Sherman, S. J., & Uhles, A. N. (2000). Varieties of groups and the perception of group entitativity. *Journal of Personality and Social Psychology, 78,* 223–246.

Louwerse, M. M., Dale, R., Bard, E. G., & Jeuniaux, P. (2012). Behavior matching in multimodal communication is synchronized. *Cognitive Science, 36,* 1404–1426.

Main, A., Paxton, A., & Dale, R. (2016). An exploratory analysis of emotion dynamics between mothers and adolescents during conflict discussions. *Emotion, 16,* 913–928.

Marsh, K. L., Richardson, M. J., & Schmidt, R. C. (2009). Social connection through joint action and interpersonal coordination. *Topics in Cognitive Science, 1*(320), 339.

Oostenbroek, J., Suddendorf, T., Nielsen, M., Redshaw, J., Kennedy-Costantini, S., Davis, J., et al. (2016). Comprehensive longitudinal study challenges the existence of neonatal imitation in humans. *Current Biology, 26*(10), 1334–1338.

Pereira, A., & van Prooijen, J. W. (2018). Why we sometimes punish the innocent: The role of group entitativity in collective punishment. *PLoS ONE, 13*(5), e0196852. https://doi.org/10.1371/journal.pone.0196852.

Pickering, M. J., & Garrod, S. (2004). The interactive-alignment model: Developments and refinements. *Behavioral and Brain Sciences, 27,* 212–225.

Reitter, D. (2017). Alignment in web-based dialogue: Who aligns, and how automatic is it? Studies in big-data computational psycholinguistics. In M. N. Jones (Ed.), *Big data in cognitive science* (pp. 246–269). London: Routledge.

Riordan, M. A., Dale, R., Kreuz, R. J., & Olney, A. (2011). Evidence for alignment in a computer-mediated text-only environment. In L. Carlson, C. Hoelscher, & T. F. Shipley (Eds.), *Proceedings of the 33rd annual conference of the cognitive science society* (pp. 2411–2416). Austin, TX: Cognitive Science Society.

Rutchick, A. M., Hamilton, D. L., & Sack, J. D. (2008). Antecedents of entitativity in categorically and dynamically construed groups. *European Journal of Social Psychology, 38*(6), 905–921.

Steiner, P. M., Atzmüller, C., & Su, D. (2016). Designing valid and reliable vignette experiments for survey research: A case study on the fair gender income gap. *Journal of Methods and Measurement in the Social Sciences, 7*(2), 52–94.

Thurston, J. A. (2012). *Exploring group perception: The relationship between perception of entitativity and assessements of cohesion.* Doctoral dissertation. Retreived from ProQuest (Accession No. 3553785).

Tollefsen, D., & Dale, R. (2012). Naturalizing joint action: A process-based approach. *Philosophical Psychology, 25,* 385–407.

Tomasello, M. (1998). Uniquely primate, uniquely human. *Developmental Science, 1,* 1–16.