

# Taking the language stance in a material world

## A comprehension study\*

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This paper investigates a special kind of social meaning-making manifest in how we experience static objects and properties of our everyday world. This happens, for example, when we recognize objects like vacuum cleaners, sliced tomatoes, and sneakers as placed in special sites in the environment. Given the compositional features of such images, we see them as designed to accomplish communicative functions. It is argued that object configurations of this kind are recognized as *externalized ostensive cues*. They are seen as having been created with the intention of setting off an intersubjective mode of perception. This significantly changes the perceiver's semiotic exploration of the scene. From a 'private' mode of sense-making mostly structured by reference to episodic, autobiographical experiential content, the perceiver takes a *language stance*. In other words, the perceiver adopts a qualitatively different meaning-constructing strategy in dealing with such images. Defending this claim, we present evidence from an empirical investigation of 20 participants' construals of photographic images depicting everyday static objects. We show that a subset of these object configurations (signals) evoke a special kind of socially responsive attitude as manifested in participants' introspective reports. The importance of these findings is brought out by discussion of parallels in neuro-cognitive work and how ostensive cues influence infant behavior.

**Keywords:** conventionality, language stance, material signals, non-verbal communication, objects

### 1. Introduction

In this investigation we focus on a special type of object-mediated communication, that is, those cases in which we happen to perceive everyday objects like chairs, sprinkles of flour, or vacuum cleaners, as means of social coordination and construction of intersubjective meaning. This is accomplished when we recognize such objects or properties of our material environment as *ad hoc* manipulated or

arranged in a striking and deliberate manner that calls for a special kind of social interpretation.<sup>1</sup> For instance, we can encounter chairs put out in the street to reserve a parking lot, flour sprinkled out in the shape of an arrow to indicate a direction, or rows of vacuum cleaners lined up on a lawn to create a conceptual piece of art.

On a fundamental plane, this novel mediating function depends on context. There is no such thing as a contextless perception of an object. An object is always perceived from a certain perspective, in a certain illumination, giving it a certain profile. Further, we bring all our previous experiences and current interests, valences and feelings to the encounter. Together, these shape perceptual experience. Perception of an object is thus jointly constituted by its inherent affordances and the immediate relevance brought to the encounter by the perceiver. For Gallagher and Zahavi (2008:99) it is this continuity between perception, thinking, and action anticipation that brings meaningfulness to our experiences. However, some cases of object perception cannot be exhaustively described in terms of such “episodic”, first-person experiences. Sometimes we encounter objects and properties where the intervention of another agent gives them a special *relevance* to us (Tylén 2007:85). Specifically, the context is constructed *for* us to profile a social meaning-potential of the object-in-context. In such cases, perception is structured by more than how an object’s affordances bear on the state of mind and past experiences that we bring to the subject-object encounter. Rather, we argue, the recognition of the scene’s purposeful compositionality sets off an intersubjective attitude in the perceiver. Making sense of the object-in-context is heavily scaffolded by another, addressing agent. Ceasing to be largely private, perception becomes *social*. By this, we refer not to the symmetrical joint attention of parties who mutually share attention to an object (cf. Tomasello 1999, 2003) — but to an *asymmetrical* relation. Triggered by contextual and compositional properties, the perceiver is prompted to seek out the role of the absent addressing agent. Attending to intentional cues left behind in the physical setting, we act as *second-person* recipients who seek intentional meaning. Examples of such externalized, ‘ostensive’ cues include seemingly deliberate placement of objects in new and unfamiliar contexts, manipulation of properties such as color or shape and arrangement of common objects in a novel composition (e.g., a symmetrical configuration) (Tylén 2007:96).

The externally motivated shift from first- to second-person attitude thus makes new details of the material scene semiotically relevant (Tylén 2007:93; Tylén and Allen 2009:228). Contrary to the first-person ‘private’ perception characterized by more episodic styles of inquiry, the second-person meaning-constructing approach depends on orienting to normative strategies. Consequently, material objects are approached as semiotic mediators of ‘public meanings’ in a fashion not incomparable to verbal utterances. In this rather specific sense, they become what Herbert Clark (2005:208) terms *material signals*.<sup>2</sup>

To capture this active meaning-pursuing strategy of the perceiver, we adapt Cowley's (2007a) notion of 'the language stance'. This arises from viewing language as the dynamics that mediate social *acts of signaling*. Approaching language as *action* rather than a specific kind of 'code-vehicle' that encodes and transports 'mental content' allows us to appreciate common aspects of cognitive functionality across modalities and structurally different media.<sup>3</sup> Rather than identify language with verbal patterns, it becomes multimodal utterance-activity (Spurrett and Cowley 2004: 444) or a mode of engaging in a social world by coordinating and signifying meaning (H. Clark 1996: 3). Far from 'exchanging' meanings by 'translating' them into code-vehicles, agents use utterance-activity to create contexts for exploring situated bodies, actions, and objects that embody meaning. Moving emphasis from 'mentalistic encodings' to how meaning is grounded in dynamic materiality demands that recipients actively pursue meaning. Just as this can be directed at utterance-activity, it can also be directed towards aspects of material structure (including texts). In actively seeking to construe meaning, therefore, a recipient will orient to relevant, often shared, exploratory strategies.

This distributed approach to language as multimodal action finds support in recent neurocognitive studies showing that many forms of communicative mediation including bodily gestures and material objects work rather like verbal patterns (cf. Tylén and Allen 2009; Tylén et al. 2009; Roepstorff 2008; Spurrett and Cowley 2004). In parallel, there is a widening consensus that our ability to use these different mediating means have common onto- and phylogenetic origins (Zlatev 2008; Donald 2002; Arbib 2005).

## 2. Extending the language stance

In empirical studies, Cowley has emphasized caregivers' reaction to young children's emerging ability to pick up on normative patterns in utterance-activity (Cowley et al. 2004; Cowley 2007a, 2007b). It is only after the first year that the young infant's early mimicry of adult caregivers' verbal behaviors will come *to be heard as* 'language'. By giving meaning to an infant's expression, adults prompt it to orient to the social norms that scaffold linguistic agency. Early expressive behaviors are thus organized around co-action where caregivers attribute meaning to infant doings. Gradually, infants learn to hear vocalizations *as* utterances of verbal patterns. Simply, they learn to hear (what adults call) *words* or, in Cowley's (2007a: 89) terms, they *take the language stance*. This shapes the second stage of learning to talk, as infants learn to reify language from talking about 'words' etc. While Cowley focuses on hearing utterance-activity as *language*, this paper extends the idea. We propose that adults can take a 'language stance' to (non-verbal) object-signals.

Rather like infants use utterances in intersubjective meaning-making, adults can systematically explore material structures as signifying meaning. In so doing, they shift from a first-person subjective perspective on material items to a second-person *intersubjective* mode of perceptual exploration (Tylén 2007:99). In effect, they direct attention to their situated, recontextualized value as mediating communicative intentions. Like utterances, these objects-in-context become *a-kind-of-language* that by integration with activities comes to signify social meaning. This social recontextualization derives from a distributed process between agents (addressers and addressees) and the meaning-potential of the shared environment (Tylén 2007:98). Not unlike the case with infant utterances, perception becomes a kind of co-action whereby a communicative intention externalized in scene's compositionality (homologue to ostensive cues) prompts receptive social engagement. The perceiver enacts the role of the recipient by using the material context to regulate interpretative action.<sup>4</sup> Further, given the fundamental asymmetry of the situation (the material signals considered here are inherently monological) the process makes extensive use of social norms and conventions that guide a perceiver's semiotic attunement (Pickering and Garrod 2004).

### 3. The recognition and comprehension of material signals

The conceptual idea gives rise to predictions that can be investigated empirically. In a recent event-related fMRI brain imaging study Tylén and colleagues presented two contrastive types of images to twenty two persons in a MR brain imaging system (Tylén et al. 2009). The stimuli consisted of a hundred photographic images of static everyday objects-in-context that were each presented for five seconds in randomized order. In the experimental condition, images depicted object configurations that called for intersubjective interpretation (e.g., chairs put out in the street to reserve a parking place or a bunch of flowers left on the doorstep of a private home to express a declaration of love, etc.). In the control condition the same objects were shown in canonical, instrumental, or accidental (non-communicative) contexts. The conditions thus contrasted objects experienced as intersubjective signals with ones that lack communicative relevance. Data analysis was based on participant post scan classification of the stimuli images (communicative vs. non-communicative) in consideration of potential subjective differences in their understanding of the scenes.

The experimenters found that when participants made communicative interpretations and explored the object configurations as sources of intentional social meaning they had enhanced activity in part of the *fusiform gyrus* (a structure also known as the Visual Word Form Area (see Cohen et al. 2000,2002; Dehaene et al.

2002) and, bilaterally, in the *pars triangularis* of the inferior frontal gyrus (part of Broca's area, BA 45). Further, the activation of right hemisphere inferior frontal gyrus showed sensitivity to the degree of conventionality of the expressive signals (the unconventional ones causing enhanced activity) as rated *post hoc* by the participants themselves. These same areas (especially left hemisphere Broca's area) are consistently found in studies of verbal language and reading while the right inferior frontal gyrus has been shown to be modulated by the enhanced context dependency of novel unconventional metaphors and figurative language.<sup>5</sup>

The results complement a growing number of cognitive neuroimaging studies that finds Broca-activity associated with more than the processing of verbal patterns. It is also activated in perceiving a variety of non-verbal, expressive activities like hand, body, and facial gestures (e.g., Lotze et al. 2006; Lawrence et al. 2006), non-verbal vocalizations (Dietrich et al. 2007), musical patterns (Vuust et al. 2005, 2006), and joint action (Newman-Norlund et al. 2008). Rather than invoke an innate 'verbal language' or 'syntax module' (c.f. Pinker 1994; Fodor 1983), Broca's area seems to be generally involved in interactive sense-making and meaning construction. Apparently, it contributes to a variety of modalities and expressive means including configurations of everyday objects (Tylén et al. 2009; Tylén and Allen 2009).

While there is strong evidence for qualitative differences in the perception of objects as signals vs. non-signals on the level of neuro-dynamics, in what follows we extend the investigation to another index of participants' (inter)subjective experiences of such scenes. In short, we investigate what verbal construals of the depicted scenes show about meaning-constructing attitudes to *signals* and *non-signals*. Accordingly, we predicted that the perceptual differences found in the fMRI-study would parallel how people construe images in different conditions. Further, a more qualitative style approach was expected to facilitate detailed studies of how social norms and attitudes shape meaning construction.

The study focuses on two central hypotheses. The first is categorical:

- there are fundamental differences in how people categorize signals vs. non-signals.

The second is semantic:

- different types of signals elicit different meaning-pursuing attitudes.

Informed by the brain imaging study, we also expected the degree of conventionality of various expressive practices to predict variance in the meaning attributed to the signals.

### 3.1 The experiment

The experiment was based on construals by healthy participants (10 females/10 males, mean age  $26 \pm 6$  (STD)) who described scenes featuring various object configurations. Of these, only some were expected to afford the intersubjective exploration sketched above. Building on the hypotheses, we aimed, first, to ascertain whether the conceptually identified distinction between first-person subjective (non-communicative) and second-person intersubjective (communicative) experiences was manifest in participants' comprehension of scenes as reflected in introspective oral reports. Second, we aimed to identify trends and normative patterns in the meaning-constructing strategies applied in interpreting material signals that vary in degree of conventionality.

Some view the comprehension of material signals as part of a perceiver's (inter)subjective phenomenal experience which lies beyond experimental reach (for a discussion see, e.g., Dennett 2001; Vallor 2009). However, following Gallagher (2003), we systematically investigated participants' experiences of object scenes using their own verbal, phenomenological reports. The task was formulated with an 'open' instruction ("*describe the stimuli and how you understand them*") that has been shown to motivate free descriptions that would (preferably) involve more than the listing of depicted objects without establishing strong interpretative biases. As shown below, the procedure gave us a rich data set that invited both qualitative and quantitative analyses.

Stimuli consisted of photographic representations depicting a variety of scenes featuring everyday objects collected from the local environment and photo sharing sites such as [www.flickr.com](http://www.flickr.com) and [www.polfoto.dk](http://www.polfoto.dk). While no persons were depicted, we included only images of actually occurring scenes. The work on neurodynamics led us to divide the stimulus images into three conditions. Twenty two participants (not those of the comprehension study) were instructed to make relevant distinctions in images of object configurations. Using an electronic questionnaire, they rated a raw sample of one hundred images on two parameters: (1) the presence/non-presence of communicative signals, and (2) the degree of conventionality of the signals (for details see Tylén et al. 2009:160). Conventionality was defined by relative frequency or how often participants expected to encounter a certain type of material signal. Statistical analysis of the data allowed us to select the eighteen best exemplars, six for each of three predefined conditions:

- Experimental condition I: images that were found to depict conventional ways of employing material objects as communicative signals. Examples: a buoy, marking the location of fishing nets, a large crowd of roses left on the pavement left in grief of a person killed there, and flour sprinkled out as an arrow to show directions.

- Experimental condition II: images that were found to depict unconventional ways of using material objects as communicative signals. Examples: a crowd of vacuum cleaners arranged on a lawn to make a conceptual piece of art, thin slices of tomato in a patterned distribution on the windscreen of a car, and an iceberg covered with red paint.
- The control condition: images that were found by the participants not to evoke any conspicuous communicative interpretations. Examples: colorful laundry hung out to dry, a blender on a kitchen table, and a fire extinguisher in a messy cupboard (see Figure 1).



**Figure 1.** Examples of stimulus images from each of the three conditions. First row depicts Experimental stimuli I: conventional ways of employing objects as signals. Second row depicts Experimental stimuli II: unconventional ways of employing objects as signals, and third row depicts Control stimuli: scenes without any conspicuous communicative relevance.

Stimulus images were presented in a randomized order on a 13.3" computer monitor using Microsoft PowerPoint. Each image was shown for sixty seconds and participants were instructed to speak while watching the images. Their oral reports were recorded using a Sony stereo IC Recorder (model ICD-SX56). The procedure provided a corpus of approx. six hours of audio recordings that were transcribed using CLAN software (MacWhinney 2000). Analyses were carried out on the transcribed material.

Overall, the methodology enabled us to test whether the conceptually grounded distinctions (partly validated in the classification study) elicit significant differences in participants' unguided, casual experience of different types object scenes. We of course recognize that the experimental procedures may not reliably reflect naturally occurring ecological subject-object encounters. Oral construal of images reflects on a participant's cooperativeness, verbal proficiency, and ability to access experiential content. Nonetheless, by presenting stimuli in contrastive conditions, we could address differences in descriptions across otherwise identical experimental settings. While an open-question is how differences apply to 'real-life', we consider it important that our categories are validated by neuroscientific findings.

#### 4. Data analysis

Our data coding was informed by Content Analysis (Neuendorf 2002). The procedure depends on *a priori* identification of variables that are associated with predetermined hypotheses. Raw data (e.g., participants' image construals) can then be coded in relation to predetermined variables. Once this is done, the coded material can be summarized and tested for significant differences in distribution across conditions. In this study, two such analyses were used to capture different aspects of image descriptions. Besides, we used qualitative semantic analyses to identify subtleties in the participants' explorations of the scenes.

The first coding procedure aimed to assess categorical intuitions (signal vs. non-signal) in relation to images from each of three stimulus conditions. We predicted this would be reflected in the distribution of specific lexical items in verbal reports. Accordingly, we sought communication- and meaning-related terms and discursive markers (e.g., references to addresser and addressee relations) of the kind that appear in the representative extracts below. These describe a control (Figure 1g) and an experimental scene (Figure 1c) respectively:

- *“Oh, it looks like your washing does when you're on holidays at a cabin or somewhere in Sweden. I can definitely see some pretty polka dot underwear. It all looks very charming and idyllic”.*

- “*You are in a forest and there is an arrow drawn in white chalk, I think, that points to the right, so you’re probably not supposed to go up the small path that is straight ahead (...)*”

Although the construals target static scenes in identical experimental settings, it is clear that the participants construe what they see quite differently. In the control (from image Figure 1g) the verbal description is apparently free of intersubjective contextualization. The participant’s sense-making relates what is depicted to private, experiential associations and preferences. In this sense, it is *episodic* or unmotivated by any appeal to intentional compositional or manipulatory intervention of another agent. In contrast, the interpretative attitude manifested in the second example (from experimental stimulus image Figure 1c), is regulated by the recognized ostensive quality of the items depicted. Properties of the scene are seen as *constructed for someone else* or as profiling a communicative context for perceptual exploration. Unlike the *episodic* sample, this is *intersubjective*. The depicted items are attributed with imperative, instructional semantic meanings. These are reflected, for example, in wordings like “*pointing to the right ...*” or the modal, deontic “*you’re probably not supposed to ...*”. The first coding procedure (see below) will focus on the contrast between episodic and intersubjective construals.

Other evidence shows that experimental scenes prompt intersubjective contextualizations. This is seen, for example, in how participants tend to conform in their use of interpretative strategies. When we go beyond the listing of items which initiates most construals (in all conditions), descriptions of control scenes (e.g., the laundry scene above) take off in directions that seem to be motivated by individual dispositions and free associations (to the weather, autobiographical memories, holidays in Sweden, etc.). In contrast, descriptions of the same experimental scenes are much more similar. This is illustrated by representative extracts below of construals of Figure 1d, depicting a crowd of old vacuum cleaners lined up on a villa lawn:

- *...And then there’s a little... a little...hmm, what is that? A little broom, I think. Some dictator or other that’s leading the vacuum-cleaner army to war...*
- *And then there’s an arrow that’s pointing out toward the picture in the foreground so that it looks as though all of these vacuum-cleaners are about to march someplace. They’re sort of standing in rank, almost, and then there’s one in front, a vacuum out in front that looks like it’s leading the others.*

Both participants note figurative resemblances between the vacuum cleaners and an army of soldiers. Interestingly, this image elicits similar iconic analogies in most participants (14/20) who appeal to either an army or a cemetery. Further, the tendency to adopt specific meaning-constructing strategies (e.g., an iconic strategy)

applies generally in experimental conditions. To explore this, measurement was made of alignment effects in interpretative strategies.

#### 4.1 Coding procedure I: Categorical resolutions

To capture fundamental differences in verbal construal of the object-scenes, three experimenters coded reports using a predefined coding scheme based on five variables: (a) *communication*; (b) *semantics/social meaning*; (c) *addresser*; (d) *addressee*; (e) *non-communicative action/activity* (see Table 1). To achieve a high level of reliability, the scheme was designed around easily recognizable, explicit lexical items. Since verbal language is a flexible means of interpersonal meaning construction, it often makes no use of explicit lexicalization. Nonetheless, our focus fell on reliable methods and, for this reason, we used a conservative strategy that gave us a stringent and objective mode of investigation.

Codings by the three experimenters were summarized in a weighted fashion for each stimulus image and each participant. Each description of an image was rated in relation to the variables ranging from none (0%), to one (33%), or two (66%) or three experimenters (100%). In other words, a 100% score would be given if all three coders assigned the variable (e.g., *communication*) to a construal. Ratings were then averaged for each image across participants. Statistically significant differences across the three conditions (experimental I, experimental II, and control) were measured for each variable using a one-way ANOVA. Furthermore,

**Table 1.** Coding scheme I.

Code	Description	Examples
A	Explicit references to communication terms	Nouns: 'sign', 'art', 'symbol', 'message', etc., or verbs: 'express', 'say', 'instruct', 'show', etc.
B	Explicit references to meaning	Social functions, modals, motivated figurative or metaphorical meanings, motivated references to objects or situation not present in the image.
C	Explicit references to the discursive marker 'addresser'	Grammatical subjects for communication related verbs like 'someone', 'an artist', 'you', etc.
D	Explicit references to the discursive marker 'addressee'	Grammatical indirect objects of communication like 'someone', 'you', 'people', etc.
E	Explicit references to non-communicative activity	Verbs like 'build', 'hang up', 'put on', 'make', etc.

Coding scheme for the multi-coder analysis of image descriptions. Three coders independently scored participants' image descriptions in relation to the five variables, defined in the scheme. In order to accomplish a high level of objectivity (and inter-coder reliability) the scheme was designed primarily to designate easily recognizable, explicit lexical items.

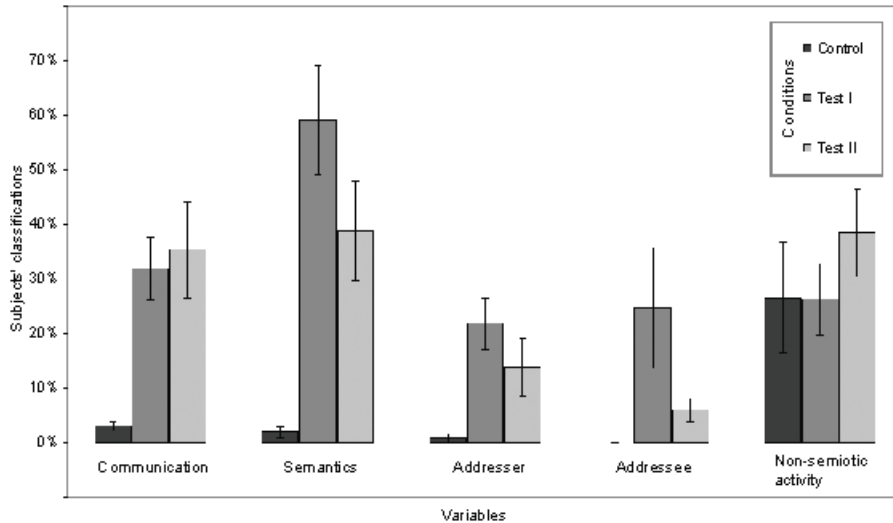
a set of planned *post hoc* analyses were executed using Tukey's HSD multiple-comparison test. Both types of analyses were performed in MatLab (Mathworks inc., Sherborn, Massachusetts, USA).

Inter-coder reliability between the three coders was measured pairwise for each variable and each participant in percent agreement (PA) and Cohen's *kappa* ( $\kappa$ ) (Cohen 1960) performed in PRAM v 0.4.5 (Skymeg Software, Inc.) and then averaged across participants, coders and variables (cf. Neuendorf 2002, for a discussion on reliability measurements).

#### 4.2 Results of coding procedure I

The one-way ANOVA showed no significant difference in the number of words used to describe images across conditions ( $F(2,15) = 2.86, p = .089$ ). Therefore, significant differences in other measures cannot be attributed to variations in the number of words used in participants' reports.

Each variable except 'non-communicative activity' showed significant differences across the conditions. Figures were as follows: *communication*:  $F(2/15) = 8.45, p = .0035$ ; *semantics*:  $F(2/15) = 13.64, p = .0004$ ; *addresser*:  $F(2/15) = 6.57, p = .0089$ ;



**Figure 2.** Diagram representing differences in the mean distribution of the three conditions in relation to each of the five variables ('Test I' corresponds to Exp. I; 'Test II' corresponds to Exp. II). The y-axis represents a summary of the three coders' weighted ratings of participants' image descriptions in percent. Error bars express standard error of the mean (SEM). All communication-related variables (*communication*, *semantics*, *addresser*, and *addressee*) showed significant effect in the one-way ANOVA ( $p < .05$ ), while the communication-neutral variable (*non-semiotic activity*) did not.

*addressee*:  $F(2/15) = 3.88, p = .0439$ ; and *non-communicative activity*:  $F(2/15) = 0.68, p = .52$  (see Table 2). Plainly, this supports our hypothesis motivated by the neurocognitive findings. Next, to explore the two experimental conditions (conventional and non-conventional signals), we used a set of pairwise *post hoc* Tukey's HSD multiple comparison tests (threshold =  $p < .05$ ). No significant effects were found. Although the two conditions show a strong trend in relation to *semantics* (*semantics*, experimental I:  $M = 59$ , vs. experimental II:  $M = 39$ ), the variability of the data made this non-significant. Thus, while the predefined variables of the coding scheme successfully captured differences between construing objects as communicative *signals* or *non-signals*, they did not show contrasts between the two experimental conditions (conventional vs. unconventional signals).

Inter-coder reliability was measured to percent agreement (PA) = 86 and Cohen's *kappa* ( $\kappa$ ) 0.56 (Cohen 1960), corresponding to a 'fair to good' agreement, (Banerjee et al. 1999). Since reliability is satisfactory, this gives validity to the statistical analyses (Neuendorf 2002).

#### 4.3 Coding procedure II: Semiotic strategies

While the first procedure explores the 'signal vs. non-signal' contrast, the second focuses on different kinds of meaning-constructing strategies. This is because, as noted, there was consistency in how these were applied in different experimental conditions. The analysis was motivated by the differences in the participants' relative inclination to align their interpretative strategies to images of the experimental and control conditions. As indicated by the results from the first coding procedure, properties of the experimental scenes alone seem to prompt participants to a language stance. In other words, they motivate interpretative explorations that use norms in an intersubjective manner. Next, therefore, we assess how participants attune to quite similar meaning-constructing strategies in their construal of images of the experimental conditions. Focusing on *social/semantic meanings*, we look more closely at the relevant image descriptions. Since such questions relate to subsamples of the data (i.e., small sample sizes), we proceed in a more qualitative fashion. Hypotheses are thus formulated *post hoc* and analyses are more subjectively motivated.

The interpretative work involved in attributing social meaning to a red iceberg (cf. Figure 1.f) differs fundamentally from that applied to a flour-arrow on a forest path (cf. Figure 1.c) or roses left on the street (cf. Figure 1.b). In coding we, therefore, asked how semiotic attitudes regulate meaning construction. In construing material signals, we find strategies that recall Peirce's classical sign types, *icon*, *index*, and *symbol* (Peirce 1998). They are:

1. An *iconic/aesthetic strategy* where attention is put on objects' resemblances and diagrammatic affordances (Stjernfelt 2007) (e.g., a red iceberg is associated with blood).
2. An *instructional strategy*, where object configurations are experienced as social imperatives, pointing to something or instructing the perceiver to adapt his/her behavior (e.g., a flour arrow shows direction).
3. A *symbolic strategy*, where material objects are appreciated for their conventional reference to arbitrary cultural meanings (e.g., roses express grief in relation to a sudden death).

Each of the image descriptions previously tagged as expressing *intersubjective meaning* were rated by an expert coder in relation to the three interpretational strategies specified above. Ratings were then summarized and analyzed for participants' relative alignment of interpretative strategy. The aim of this analysis was to establish the extent to which participants tend to choose similar interpretative strategies in construing a material signal. Alignment was measured by the percentage of agreement in semiotic attitudes to each of the images of the experimental conditions. Separate measurements were applied for two types of agreement/disagreement encountered in the data: (1) *inter-subject agreement* (e.g., two participants choose the same strategy in their exploration of an image), and (2) *intra-subject agreement* (a participant settles on a single strategy rather than drifting between several alternative interpretative strategies in the exploration of an image).

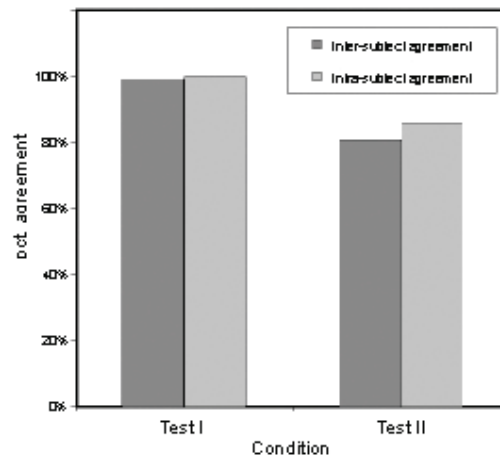
Table 2. Coding scheme II.

Code	Description	Examples
Icon	An <i>iconic/aesthetic strategy</i> : objects are appreciated for their intended aesthetic qualities	Explicit references aspects of artistic compositionality such as symmetry, intended resemblances or figurative/metaphorical analogies
Index	An <i>instructional strategy</i> : objects are experienced as social imperatives for coordination or instruction	Explicit attribution of perceiver-directed deontic meanings for instance manifested in modal verbs such as 'shall', 'ought to', 'is supposed to', etc.
Symbol	A <i>symbolic strategy</i> : objects are appreciated for their conventional reference to arbitrary cultural meanings	Explicit references to meanings associated with specific cultural uses of objects as symbols

Coding scheme for the identification of different semiotic strategies applied by participants in their descriptions of material signals. An expert coder scored participants' image descriptions in relation to the three variables, defined in the scheme.

#### 4.4 Results of the second coding procedure

Analyses revealed strong alignment effects in participants' interpretative approach to images of the experimental conditions (overall agreement=91,5%). Generally, participants independently adopted the same meaning-constructing strategies in their approaches to experimental scenes. For example, in the descriptions of the rose-scene (Figure 1b), 18/20 participants categorized the roses as a signal. Of these, 17 did a symbolic reading relating the roses to grief in relation to the recent, unnatural death of someone at the particular spot (while only one participant made an aesthetic reading). Interestingly, however, there were substantial differences in relative agreement between the two experimental conditions (*conventional* and *unconventional signals*). For example, the interpretative approach to Figure 1d (vacuum cleaners lined up on a lawn), shows much weaker alignment effects. Thus while 17/20 participants categorize the vacuum cleaner scene as a signal, only 12 participants agree in their choice of an iconic-aesthetic interpretative strategy (associating the scene with a cemetery or an army of warriors). Others are more hesitant in their strategies. This difference applies generally to the two experimental conditions. Thus, while we observe a high inter-subject alignment in the case of the conventional material signals (*inter-subject* PA = 99%, *intra-subject* PA = 100%), the alignment effect is weaker for the unconventional material signals depicted in images of experimental condition II (*inter-subject* PA = 81%,



**Figure 3.** Diagram expressing the relative agreement (in percent) of participants in their choice of interpretative attitude across experimental conditions. Two types of agreement are represented: (1) inter-subject agreement (the extent to which two or more participants agree in their choice of strategy), and (2) intra-subject agreement (the extent to which each participant commits herself to a single interpretative strategy rather than indecisively drifts between several alternative strategies).

*intra-subject* PA = 86%) (See Figure 3). Participants' interpretative approaches to unconventional material signals show more uncertainty. This is shown by both a higher between-subject disagreement and participants' enhanced inclination to look at the same figure from several possible interpretative strategies.

## 5. Discussion

The results of both coding procedures show substantial differences between experimental and control scenes supporting our initial hypotheses. People consistently seek to construe the meaning of signals and non-signals differently echoing the neuro-cognitive findings reported above. Just like the neurocognitive studies found perception of signals (and not non-signals) to activate brain areas consistently associated with verbal language and gesture, a similar effect is found manifest in descriptions of objects-signals. These are approached as sources of intersubjective meaning-making. Coding procedure I shows the effect 'within subjects' pointing to significant differences in the way the participants lexically construe their reports of experimental vs. control scenes as signals and non-signals respectively. In the second coding procedure, the effect is shown 'between-subjects': while we found great inter-subject variation in descriptions of the control scenes, participants' descriptions of experimental scenes are characterized by a strong propensity to alignment. Independently, participants do very similar descriptions of particular scenes applying distinctive semiotic strategies.

Object-signals thus evoke a special kind of social responsiveness constraining the construal of these scenes. If perception of non-signal objects is a more private affair that uses unregulated, episodic sense-making, certain objects-in-context have an ostensive quality that alter participants' attitudes to construal: they *take a language stance* towards sources of intersubjective meaning. This is shown, for example, by explicit references to communicational concepts, social meaning, and discursive roles.

Ostensive cues set off a participatory style of perception and meaning-making. This finding is paralleled in recent behavioral studies of infant cognition. In experimental work (e.g., Gergely et al. 2007; Senju and Csibra 2008; Senju et al. 2008), infants are found to respond differently to adult object manipulations where they are uninitiated observers and ones where they are active recipients. When an infant was placed in a third-person 'observational' perspective, adult behaviors were taken to express the dispositions of this specific experimenter (e.g., "Jane likes broccoli"). In contrast, when the experimenter used ostensive cues (such as making eye-contact, nodding and vocalizing in 'motherese') that invite infant participation, object-oriented actions were construed as providing

socially shared information about the world (e.g., “Broccoli is good!”). Given how such an orientation can shape interaction, we can surmise that an infant’s participatory engagement affects its sense-making attitude (Gergely et al. 2007). From a ‘private’ and episodic style of perception, the interactive recontextualization of bodily actions and objects made them mediators of shared social meanings (Tylén and Allen 2009). Extending such findings, the experiments reported above show how adults attune to distributed and detached styles of ostention in dealing with what they take to be purposeful configurations of objects-in-context. The effect in terms of intersubjective recontextualization is though comparable as reflected in participants’ verbal construal of object-signals, as well as the referred neuro-cognitive evidence.

Having hypothesized that different types of object-signals would evoke different meaning-pursuing attitudes, the second coding procedure used Peirce’s classification of sign types (*icon*, *index*, and *symbol*) to explore normative aspects of meaning-construction. A striking example arose in comparing descriptions of two images used in the experimental conditions (Figure 1.c and 1.d). Both depict an arrow in a central position of the scene, but in different contexts. In Figure 1.c flour is sprinkled out to form an arrow on a path in a wood, and in image 1.d a road sign depicting an arrow is lying on a lawn surrounded by old vacuum cleaners arranged in rows. While Figure 1.c was found to elicit an instructional/indexical style of interpretation, Figure 1.d rather called for aesthetic/iconic meaning. Though an arrow could be regarded as a conventional type of ‘symbol’ with an almost inherent diagrammatical meaning (Stjernfelt 2007), the interpretative approach to the two scenes influence how participants construe the two arrows.

In their descriptions of Figure 1.c participants consistently adopted an instructional/imperative reading of the arrow. This is manifest in their use of more than twice as many modal verbs expressing deontic meanings (ex. should, ought to, have to, etc.) than in Figure 1.d (Figure 1.c: 26, Figure 1.d: 9). Such interpretation is very rare in describing Figure 1.d. In an aesthetic setting, the arrow is not experienced as addressing the perceiver in an instructional or imperative way. Rather, it “just points”. This is illustrated by extracts from descriptions of Figure 1.c and Figure 1.d, respectively:

- “*You are in a forest and there is an arrow drawn in white chalk, I think, that points to the right, so you’re probably not supposed to go up the small path that is straight ahead (...)*”.
- “*(...) In front of the vacuum cleaner formation you see a road sign with an arrow pointing ahead to the foreground and this sign lies upon something that looks like cardboard on which is drawn the American flag*”.

Contrary to instructional signals, the intersubjective relevance of aesthetic compositions (like the vacuum-cleaner scene) is not construed as intended to modify the behaviors of the perceiver. The arrow is thus taken only to relate to the other components of the configuration.

Participants not only agree in construing certain object configurations as intersubjective signals, but also show enhanced sensitivity to compositional details that constrain semiotic exploration of the various scenes. Thus, participants end up assigning different meanings to otherwise quite similar objects (like the two arrows) in orientation to their *socially constructed* contexts. This can be illustrated by how the experimental distinction between *conventional* and *non-conventional* signals influence how norms serve to align semiotic attitudes. Specifically, we can examine how conventionality influences verbal construals. While the distinction showed no significant effects on the categorical level (signal vs. non-signal), in the second coding procedure it served as a predictor of participants' inclination to align their semiotic attitudes. In contrast to the conventional style signals of the experimental I condition, descriptions of the unconventional signals show less closely aligned construals. Participants tend to adopt competing interpretations.

An illustrative example is found in participants' descriptions of Figure 1.e. The image depicts a red car with a bunch of thin tomato slices distributed in an ordered pattern on the windscreen. The car is apparently parked among other cars in a parking lot. The image divides the participants between groups who use contrasting interpretative frames. This is illustrated by two descriptions:

1. *"I don't think they got there naturally, so I think it's meant to be some kind of artistic statement, the way the slices of tomato have been put on that window. I don't know exactly what it should mean. It could be some kind of parallel with the color red, or, I don't really know. It could be health related, like the car has been infected with tomatoes, or something weird like that".*
2. *"It's some kind of hostile act, or somebody pulling somebody else's leg by putting slices of tomato on the windscreen of their car. Either way it's a pretty strange thing to do. And it's not quite clear what's going on. It could of course be somebody playing a practical joke with (or on) some friends".*

The first example represents how about half of the participants apply an iconic, figurative attitude to the scene (in parallel to the red iceberg or the vacuum-cleaners). Some participants even suggest that the scene may be a "piece of art". By contrast, a slightly smaller group appreciate the tomato configuration neither for its iconic resemblances, nor as a social instructional imperative (like the arrow). Rather, they see it as a *symbolic message* between interlocutors who use a more arbitrary kind of reference (comparable to the roses-scene). Accordingly, the tomato-scene becomes a hostile act or a practical joke addressed the owner of the car.

The unconventionality of the expressive practice suggests a possible basis for the conflicting interpretative strategies observed. Given its novelty, the scene offers only weak constraints on intersubjective contextualization. As a result, there is variability in the distribution and weight of attention applied to different constituent parts of the scene (Rollins 2004). Though participants tend to agree that the object configuration is intended as a communicative signal, the meaning seems to beg for more contextual support. The scene can be imagined as a part of a larger context where preceding events would ground the ‘proper’ interpretation. The object configuration is seen as addressing “initiates” who have the prerequisites needed for proper construal. Naïve to this preceding story, many participants base their interpretation on intuitions about what is depicted. This results in two distinct types of interpretations (iconic/aesthetic and symbolic) which reflect different perceptual-attentional strategies: If we focus on the symmetrical compositionality of the vegetable slices and the sameness of color between car and tomatoes this can motivate an aesthetic reading. From this perspective, we see a well-ordered arrangement of the items. Those who take a global view and disregard compositional details, by contrast, attend to the everyday scenery of the parking lot. In such cases, the artistic construal is less likely than one which focuses on a symbolic, “practical joke”.

The example gives support to how object-signals prompt us to take a language stance. Indeed, the simple fact that participants construe this unconventional and ambiguous object constellation shows that they do not depend on arbitrary encodings. As Kravchenko (2007) and others argue for language, they rely on neither cultural conventions nor innate brain modules. Just as with utterance-activity, expressive practice is neither purely learned (as a set of tokens) nor reliant on direct mapping onto *a priori* neural structure. Rather, proper comprehension depends on sensitivity to the meaning potential of the contextualized material structures (Tylén 2007). By taking the language stance towards such scenes, participants attune to intersubjective contextualizations that shape how they attend to semiotically relevant features of the scenes (e.g., diagrammatical relations, as seen in Stjernfelt 2007; symmetries and asymmetries, Leyton, 1992, etc.).

## 6. Conclusion

We examined a special kind of social sense-making activity manifest in how we come to perceive novel configurations of everyday objects as mediating communicative interaction. This happens when such configurations are experienced as arranged or manipulated in striking and purposeful ways that evoke a special style of exploration. From a ‘private’ mode of perception structured by reference to episodic experiential content, compositional cues trigger a ‘public’ mode of perceptual

sense-making: objects and properties of the material environment are explored as sources of intersubjective meaning-making. In the experiment, we assessed participants' casual comprehension of a series of images depicting three predefined categories of static scenes: conventional material signals, unconventional material signals, and object configurations without any conspicuous communicative relevance. Analyses of participants' oral construals suggest that they consistently pick up on certain compositional details — homologue to ostensive cues (Sperber and Wilson 1988: 49) — and approach object configurations of the experimental (and not the control) conditions from a *language stance*. In our extended use of the term, the images prompt motivated enactment of a second-person recipient's perspective on properties of our physical surroundings. The perceiver thus recognizes his/her role in co-acting intersubjective meaning-construction. In the experimental investigation, this shift in the perceptual attitude is manifested in two main ways. First, we find significantly more explicit references to communication and meaning related terms. Second, the resulting descriptions make more references to the discursive roles of addresser and addressee. This difference in attitude to object-*signals* and *non-signals* is supported by the neuro-cognitive finding that only the object-signals elicit enhanced neural activity in meaning related brain regions such as Broca's area of the inferior frontal cortex (Tylén et al. 2009: 162). Further, they are also consistent with behavioral studies of how ostensive cues affect infant comprehension of object manipulations (Gergely et al. 2007; Senju and Csibra 2008; Senju et al. 2008).

Besides the categorical distinction between communicative and non-communicative object configurations, the social contextualization of the objects in the experimental conditions shows strong regulating effects on participants' interpretative attitudes. In contrast to the variability in participants' sense-making approaches to images in the control condition, experimental conditions bring out striking similarities in how participants approach the images. By and large, they agree in construing some scenes as iconic-aesthetic and others in instructional-deontic or symbolic ways. We suspect that these alignment effects are due to an orientation to shared norms for such expressive practices (akin to *top-top interaction* in Roepstorff and Frith 2004: 196). Entering the intersubjective domain of material signals, the perceiver thus directs special attention to normative traits of the composition that guide semiotic intuitions. This regulating context-sensitivity is evident for instance in participants' agreement on quite different interpretations of otherwise similar objects in different settings (cf. the arrows in Figure 1c and 1d).

Language and communication do not rely on 'conveying' specific semantic meanings 'through' arbitrary codes. Rather, they permit intersubjective co-construction of proper contexts for the exploration of situated bodies, actions, and objects that embody meaning. This process entails responsive sensitivity to dynamic

matter and attunement to regulating norms that guide our meaning-construction.

## Notes

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1. As discussed in Tylén (2007), this can be conceptualized as *semiotic agency* which itself is a kind of *manifested action* (see also H. Clark 2005:513).
2. In Clark's words: "... *signals* are actions by which people mean things for others, and *material signals* are those in which people deploy material objects, locations, or actions around them. Plainly, material signals are communicative acts ..." (2005:508).
3. There are many challenges to the view that language does not depend on the encoding and transporting of 'mental content'. Thus A. Clark (2006) argues against *translation models* and, in a quite different tradition, Kravchenko (2007) denies that language should be regarded as a *code*.
4. Most material structures lend themselves to several alternative meaning exploring interpretations (see, for example, Myers and Liben 2008), which consider attention and attunement to addresser's original intention crucial (see also Levinson 1979).
5. See Tylén et al. 2009 for extensive references.

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