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The Semantics of Prepositions

An exploration into the uses of *at* and *to*

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H&SS Senior Honors Thesis

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April 19, 2010

1. Introduction

This exploration begins with the observation that the English prepositions *at* and *to* can often be used in the same linguistic environments, but with subtle differences in meaning. Consider, for instance, the sentences below:

(1) *John threw the ball to Mary.*
(2) *John threw the ball at Mary.*

These two sentences are fairly straightforward and unambiguous, and most native English speakers will intuit the subtle difference in meaning between the two utterances. The only linguistic difference between these two utterances is the choice of the prepositions *to* and *at*. Looking at existing literature on the subject, the ways in which these prepositions contribute to the difference in meaning remains unclear.

The goal of this thesis is to provide a characterization of the semantic contributions of *to* and *at* so as to explain the difference in meaning between pairs of sentences exhibiting the *to*/*at* alternation. In doing so, I will explore not only the context given above but a variety of usages of each of these prepositions. I will first establish the basic senses of the two prepositions as they are presented in existing works on the subject and then discuss the particular senses of *to* and *at* in use in sentences that exhibit this alternation.

The central claim of the thesis is that *to* can serve to introduce two types of event participants, what I call *participatory goal* and *non-participatory goal*, while *at* introduces only the latter of these two types of participants. I argue that this novel distinction allows us to account for the behavior of *to* and *at* in a variety of contexts. I explain some core differences between the different uses of *to* as they relate to this distinction, and explain the special "punitive" sense of *at*, as illustrated above in (2), as a narrowing of the meaning of *at* in environments in which its core meaning overlaps with that of *to*. I will then apply my theory to a variety of linguistic environments to validate my claims.

2. Establishing the basic senses of *at* and *to*

As Saint-Dizier (2006, p. xi) points out, prepositions have not received much attention from linguists over the past 15 years. Computational linguists have been attempting to decipher and formally codify the syntax and semantics of natural language, paying special attention to nouns, verbs, and adjectives, typically considered the bigger, meatier, semantically more satisfying units of language. There have even been in-depth examinations of tense, aspect, quantification, and other related phenomena. Prepositions, on the other hand, are inherently polysemous, not used uniformly across languages (some have postpositionals, some incorporate the meanings into verbs), and hard to accurately predict (a feature crucial for machine learning) even within those languages that do use them. As such, prepositions have attracted less attention than other language features. Prepositions are essential, however, to understanding language; they express relationships. In The British National Corpus's (Leech, Rayson, & Wilson, 2001, p. 120) list of the 30 most commonly used words in English, 8 are prepositions.

Fortunately, there are linguists who have embarked down this path before, attempting to classify the multiple uses of the various prepositions. In this section, I will review some of the existing work on this topic, attempting to find explanations within these analyses for the questions raised above.

2.1 The basic sense of at

Let us begin with the preposition *at*. While perhaps more marked than the preposition *to* when comparing sentences (1) and (2), *at* is considered by most linguists as the more basic of the two prepositions. Lindkvist (1950, pp. 177-8) sets forth five classes of uses of *at*, the first "in general" case being to denote position. This basic use of *at* has been taken by other linguists as the 'core' meaning of *at* (Leech 1970, Bennett 1975, Cresswell 1978, Herskovits 1986, Nam 1995); they tend to ignore Lindkvist's other four classes, or when they do acknowledge these other uses, the exceptions are explained as extensions of this 'core' concept, often without any further justification or exploration.

We will consider these linguists' analyses and their justifications as well as examining Lindkvist's categorizations.

Leech (1970, pp. 161-2) and Bennett (1975, p. 71) both characterize the core sense of *at* as a one-dimensional locative expression, that is, expressing the location of an entity as being at a specific point.

(3) *The intersection of the lines is at coordinates (3,4) on the graph.*

Contrast this one-dimensional locative expression with the following two- and three-dimensional locative expressions:

(4) *The ice skater twirled on the pond.*
(5) *The astronaut checked his equipment in the airlock.*

Note that the intersection of lines in (3) is at a specific one-dimensional point, the ice skater in (4) was on the two-dimensional surface of the pond, and the astronaut in (5) is entirely contained within the bounds of the three-dimensional space of the airlock. The prepositional phrases in these examples describe specific positions (the point of intersection, the pond, and the airlock). This can be contrasted with those prepositional phrases that pick out one of the endpoints of a movement, such would be described by a path or goal expression, as in (6) and (7).

(6) *The sparrow flew from its nest.*
(7) *The horse galloped to behind the barn.*

Both *the nest* and *the barn* describe endpoints, source and goal respectively, of movement along a path. The prepositional phrases of (3), (4), and (5), on the other hand, express locations independent of such a path or direction, and can thusly be said to express "simple locatives." Further, the *at* as used in (3) can be taken as encoding a simple one-

dimensional locative expression. This understanding is one we will accept for the remainder of this exploration.

Working off of Bennett's explanation, Cresswell (1978, p. 16) claims that not only does *at* express a simple locative, but many other prepositions express that same simple locative along with other information. *From*, for instance, also encodes a simple locative in addition to the notion of "source." Because *at* encodes only this simple locative, it does not appear in sentences alongside those expressions that encode the simple locative in addition to more complex structures. It is for this reason that the strings **from at* and **at from* are ungrammatical; *from* already expresses the simple locative, so *at* becomes unnecessary. Cresswell's conclusion is simple but carries explanatory power, clarifying why *at* does not appear in every sentence that involves the expression of a simple locative, and so his view will be adopted here. Cresswell, however, expresses this analysis within a framework of deep and surface structures, which I will not adopt in developing my analysis.

Bennett describes *at* as operating only in one dimension, with *on* and *in* being its two- and three-dimensional counterparts, but stresses the fact that the size of the one-dimensional 'point' described by *at* is relatively variable. This allows for the *at* in (3), which is strictly one-dimensional, and the *at* in (8), which requires a more flexible definition of "one-dimensional", to both be considered as using the same core sense of the preposition.

(8) *Paul is at the supermarket.*

This extension is reasonable, as people don't perceive objects in the world as being strictly composed of points, lines, or other geometric shapes. Other relationships, like containment or proximity, might also reasonably be considered to explain Paul's relation to the supermarket. The fact that sentence (8) can be used felicitously whether Paul is actually inside (strictly containment) or just outside (strictly proximity) of the building demonstrates that Bennett's description is more accurate than other potential relations.

This description allows for many simple occurrences of *at*, such as (8), to be considered as using the same core sense of *at* as (3).

Herskovits (1986, pp. 50-2), who similarly to Bennett describes the core sense of at as the coincidence of points, has an analogous method of describing at. Hersovits also wants the uses of at in (3) and (8) to be classified as the same sense, and so she argues that the objects in question needn't be strictly one-dimensional, but rather are taken as points and considered as if one could describe the world in strict geometric terms. Thus the supermarket in (8) may be considered a point, even though it should strictly be considered a three-dimensional object.

Herskovits takes this theory even further than Bennett, explaining that by the same token one can conceptualize time as a real line and events as points along that line. Thus the occurrences of *at* in (3)-(8) can be described as having the same sense as the *at* in (9).

(9) *We had lunch at one o'clock.*

Even though lunch does not take place over a single point in time, it is fixed by the point at which the meal begins, ignoring duration. Thus, whether lunch lasts five minutes or three hours, it is still acceptable to use (9) to describe that lunch. Herskovits's expanded temporal description of *at* is likewise a reasonable extension that can still be considered part of the core definition of *at*. It should be no surprise that *at* can be applied not only to physical space but to temporal space, for a few different reasons. First, there are a number of other linguistic patterns that demonstrate the overlapping understandings of physical and temporal space in English. The prepositions *before* and *after*, for instance, are used both spatially and temporally.

(10) *The priest stood before the altar.* [spatial]

(11) *He called the caterer the day before the ceremony.* [temporal]

(12) *The man in line after me was talking on his cell phone.* [spatial]

(13) *She went to the movie after dinner.* [temporal]

Similar examples can be found for the adverbs *forward* and *backward*, and the verbs *pass*, *fly*, and *crawl*, among others. Third, there is a great deal of research that explores how people use spatial metaphors to talk about time (Alverson, 1994; Clark, 1973; Traugott, 1978) as well as research that supports that theory (Casanto & Boroditsky, 2008; Gentner, Imai, & Boroditsky, 2002). Lakoff justifies the way we use space to talk about time, saying:

> In our visual systems, we have detectors for motion and detectors for objects/locations. We do not have detectors for time (whatever that could mean). Thus, it makes good biological sense that time should be understood in terms of things and motion. (1993, pp. 218)

Radden (2003) expands on this point and traces the metaphor TIME AS SPACE across languages. Some of Radden's English examples include phrasings like *The stories have been passed down through the generations*, *I'm looking forward to seeing you*, or *Your birthday is coming up*. It is far from outlandish, then, to group the temporal use of *at* with the core spatial sense discussed above, and it is this view I will adopt here.

If the spatial and temporal uses of *at* are considered to be a shared sense, one might expect *on* and *in*, the two- and three-dimensional counterparts of at, which also have temporal uses, to exhibit the same identity of senses. But while *on* and *in* can indeed be used temporally, they do not as neatly map onto the spatial distinction of two- and three-dimensionality. Considering the phrases *on Monday* and *in March*, for example, does not give one the sense that *March* is somehow more three-dimensional than *Monday*. There are, however, set roles for *on* and *in* (and *at*) in their temporal uses. *At* is used for specific times (e.g. *at dusk*, *at 3 o'clock*), *on* is used for days and dates (e.g. *on Monday*, *on March 3rd*), and *in* is used for longer periods of time and for nonspecific periods of time within a single day (e.g. *in March*, *in the summer*, *in the 80's*, *in the afternoon*).[1] So while there are usage boundaries, they do not map neatly onto the one-, two-, and three-dimension categories that exist in the prepositions' spatial uses, nor is there any clear justification for the use *in* is some contexts and *on* in others. This lack of parallelism may

[1] There appears to be some slight overlap, as both *He wrote the paper at night* and *He wrote the paper in the night(time)* are grammatical. While one could argue that *at night* might refer to the beginning of the night, while *in the night* would refer to the entire duration, this distinction provides little utility as there appears to be no semantic difference between the two sentences.

be explained by the nature of our conception of time: while it is easy for us to distinguish among three dimensions in physical space, we cannot do so in terms of time. We can imagine a specific point or an extension of that point into a line – a duration – but it is hard to expand that notion into a third dimension. Nevertheless, considering the overlap between our conception of physical and temporal space, it seems logical to consider the temporal use of *at* as part of the core sense of the preposition, unless one insists on a parallelism among the temporal uses of *at*, *on*, and *in*.

We return now to discussion of the core use of *at*. Both Bennett and Herskovits attempt to make room in their respective theories for the flexibility of usage that *at* exhibits. Not only does *at* allow for the 'expanded' point of the supermarket in (8) but the same simple locative sense of *at* also allows for sentences like:

(14) *Trevor is at the sofa.*
(15) *The car is at the corner of 6th and Broadway.*

Bennett (p. 68) points out that (14) can be used to mean that Trevor is <u>next</u> to the sofa (if other people are next to other things in similar fashions). On the basis of this observation, he argues for variability in the size of the 'one-dimensional point'. Herskovits uses (15) to show that the conceptually-mapped points in question need not be in exact contact, but can be approximate "given a certain tolerance." This theory allows the car in (15) to be dozens of feet from one of the corners of the intersection, and still be accurately (within an acceptable range) described as *at the corner*.

Herskovits defends her explanation by pointing out that modifiers like *exactly*, *precisely*, etc., reduce the tolerance that the preposition will allow.

(16) *The car is parked at the corner.*
(17) *The car is parked exactly at the corner.*

While (16) allows for the car to be some distance away from the corner, (17) allows only a much reduced distance. While the car in (17) may still be five or ten feet from the corner, one would the range allowed by (17) to be smaller than that allowed by (16). Sentence (16) does not carry the same strict interpretation of *at*, and therefore does not carry the same strict expectation/truth condition. Without being restrained by *exactly*, then, *at* has a flexible allowance for the bounds of its "one-dimensional" location. When accompanied by *exactly*, *at* loses this allowance and, returning to its default, describes a one-dimensional coincidence of points, as described above. The points in question must occupy precisely the same location or the sentence is rendered false. This same effect holds true with temporal uses of *at* as well; while sentence (9) could be used for a lunch that began at 1:05, the same lunch could not be described as being *exactly at one o'clock*. A similar flexibility can be found in many different expressions (consider the range of colors than can be described as "red" or the variability in which things can be described as flat) and that looseness too can be overridden by adding words like *exactly* or *precisely*. The widespread occurence of this looseness notwithstanding, this *exactly* test demonstrates the flexibility allowed by *at*, and Herskovits's description of the core sense of *at* will be taken here as accurate.

Having accounted for what they have deemed a majority of the instances of *at*, most of the linguists mentioned above move on to the uses of other prepositions. They neither discuss nor seemingly consider the use of *at* as it appears in our own sentence (2). Bennett notes the existence of exceptions, including specifically the *throw at* of (2), but decides that "there is a certain similarity between *throw at*" and the locative *at* as he has set it forth, and does not pursue the issue further.

Only Lindkvist cites multiple examples of non-'basic' uses of *at* and classifies them into different senses. He also pairs each sense of *at* with other prepositions sometimes used to denote similar states or relations, but is careful to note the slight differences in meaning between the use of *at* and the use of these other prepositions, here listed alongside each sense. He lists the senses as "motion into contact" ((18)), "direction

of a movement" ((19)), "direction without movement" ((20)), and "motion and direction through an object" ((21)).

(18) *It was Mrs. Johnson knocking at the door.*
[*at* can be replaced by *on, against*]

(19) *The kitten leapt at the spider as it tried to pass.*
[*at* can be replaced by *towards, against*]

(20) *The boys hooted at Deborah as she walked down the street.*
[*at* can be replaced by *towards*]

(21) *The car went in at the gates and nobody noticed it.*
[*at* can be replaced by *through, from, by*]

It is the sense of "direction of a movement", as in (19), that Lindkvist identifies with our own (2) and other "verbs denoting different *acts of throwing*… to indicate the goal towards which the throwing is directed…"

While Lindkvist's categorization is thorough and he goes so far as to include multiple literary citations for each of the senses he identifies, there are similarities significant enough to warrant the union of some of these senses There are, indeed, distinctions to be made among the different contexts which allow different preposition replacements, as in (18)-(21), in all of which *at* can appear. Despite these distinctions, however, these different contexts are not completely unrelated; there are also important similarities to be drawn between some of these contexts that allow us to view them as unified uses of *at*. Both the "direction of a movement" and "direction without movement" senses, for instance, display a similar alternation between *to* and *at* as in our own (1) and (2). Compare:

(19) *The kitten leapt at the spider as it tried to pass.*

(19b) *The kitten leapt to the spider as it tried to pass.*

(20) *The boys hooted at Deborah as she walked down the street.*

(20b) *The boys hooted to Deborah as she walked down the street.*

The *at* that carries the "direction of a movement" sense, as in (19), can be replaced by *to*, which results in a grammatical sentence albeit with a different meaning, (19b). The kitten's leap in (19b) seems to be less aggressive than that of (19), and thus one does not assume that the spider will come to harm in (19b) while it seems likely in (19). This is quite similar to our own (1) and (2), repeated here:

(1) *John threw the ball to Mary.*
(2) *John threw the ball at Mary.*

Both of those sentences involve movement (of the ball), but where (1) seems vaguely cooperative, (2) seems distinctly aggressive. In (20) and (20b) the action is communication rather than physical movement, but a similar parallelism exists; in (20b) the hooting seems more cooperative, while in (20) the hooting seems at least uncooperative if not aggressive. These two senses, both primarily relating to directionality, can in fact be thought to be a single use of *at*.

The primary distinction Lindkvist makes between the senses "direction of a movement" and "direction without movement", that of movement, can actually be thought of as physical movement as opposed to metaphorical movement. The kitten in (19) physically moves, as *leap* is an agentive verb of manner of motion (Levin 1993, pp. 265-6). While the boys in (20) certainly do not move, their hoots can be thought of as moving from the boys toward Deborah. Indeed, all of the verbs of communication, be they human or animal (Levin 1993: pp. 202-12), can be said to describe not "direction without movement" but metaphorical movement. This metaphor of communication as physical movement can be seen in expressions like *The joke went over my head* or *get the idea across*, and is described by Lakoff and Johnson (1980) as the "COMMUNICATION IS SENDING" metaphor.

Lindkvists's other two senses, "motion into contact" and "motion and direction through an object", however, do not display the same *to*/*at* alternation as the first two.

(18) *It was Mrs. Johnson knocking at the door.*

(18b) **It was Mrs. Johnson knocking to the door.*

(21) *The car went in at the gates and nobody noticed it.*

(21b) ? *The car went in to the gates and nobody noticed it.*

While (18) is grammatical and sensible, the same sentence with *to* replacing *at*, (18b), is nonsensical and ungrammatical. And while (21) makes sense, (21b) only makes sense if the gates are somehow permeable, a la Harry Potter's Platform 9¾. For the most part, neither of these senses allows *at* to be replaced by *to*. In fact *at* appears in these senses only in contexts in which *to* is not an option. As a result, replacing *at* with *to* in sentences (18) and (21) yields ungrammatical strings. Sentences (19) and (20), though, can have *at* replaced by *to* and still yield grammatical sentences, albeit with different meanings. This supports the association of the senses of *at* as in (18) and (21) as well as the linking of the senses in use in (19) and (20).

These associations are further supported by the fact that the two senses "motion into contact" and "motion and direction through an object" are also much closer to the core sense of *at*, the simple locative, than Lindkvist's two other senses. It is not much of a stretch of think of the door in (18) as the location of Mrs. Johnson's knocking, nor to think of the gate in (21) as the location of the car's entrance. In contrast, it is hard to consider the spider in (19) as the place of the kitten's leap, nor Deborah in (20) as the location of the hooting. While Deborah and spider may indeed be endpoints along a path, *at* does not seem to be functioning as a simple locative in relation to the two targets. Putting each sentence in a locative context further illustrates this difference:

(18c) *Where did Mrs. Johnson knock?*

Mrs. Johnson was knocking at the door.

(19c) *Where did the kitten leap?*

 # The kitten leapt at the spider as it tried to pass.

(20c) *Where did the boys hoot?*

**The boys hooted at Deborah as she walked down the street.*

(21c) *Where did the car go in?*

The car went in at the gates and nobody noticed it.

(18c) and (21c) are both fine as a response to a *Where* question. This supports the claim that they are at base both locative expressions. (19c) and (20c), however, are strange, at best, as responses to the same type of question. (19c)'s response can be understood as sensible if one considers the question to be focused on the endpoint of the motion of leaping. If, however, one understands the question to focus on the location of *the kitten* at the time of leaping, then (19) is not a sensible or felicitous response to (19c). This demonstrates that the senses "motion into contact" and "motion and direction through an object" are closer to the core sense of *at* than "direction of a movement" and "direction without movement". Where the former two uses of *at* can be said to encode a simple locative, the latter two involve a sense of direction or motion along a path.

We can take the senses "motion into contact" and "motion and direction through an object" simply as extensions of the core locative sense of *at* already established. Both involve an expression of the simple locative as well as an additional relationship. If the *at* in (18), for instance, only encoded a coincidence of points, the coincidence of Mrs. Johnson's knocking and the door, then there would be no semantic difference if *the door* were to be replaced by *the doorway* or *the doorstep*. These replacements, however, do not convey all of the same information as the original (18). With this replacement, one could understand Mrs. Johnson to be standing at the doorstep but knocking against the wall; (18) allows Mrs. Johnson to be knocking only against the door, not the wall. Similarly, (21) adds the relation of 'by way of' to association between *the car* and *the gates*. These senses of "motion into contact" and "motion and direction through an object", then, are slight extensions of the core locative sense of *at*.

If we take these two senses as minor extensions of the core locative sense of *at*, then the only non-core senses acknowledged by Lindkvist are "direction of a movement" and "direction without movement". If we further identify these two senses as a single directional use of *at*, be it physical or metaphorical movement, as above, then we are left

with only a single non-core use of *at*, that of our own sentence (2). This leaves us, then, with the following observations about possible uses of *at*. *At* can be used either as a simple locative, indicating the spatial or temporal location of an object taken as a point, or as an indicator of physical or metaphorical movement in a direction.

2.2 The basic sense of to

Let us now consider the preposition *to*. Most linguists consider *to* to signal the thematic role goal. Saeed (2008, p. 141) defines goal as "the entity towards which something moves, either literally as in [(22)] or metaphorically as in [(23)]:"

(22) *Sheila handed her license to the policeman.*
(23) *Pat told the joke to his friends.*

Both Gruber (1970, pp. 52-3) and Bennett (1975, pp. 89-91) agree that *to* signals a goal role. That is to say, the complement of the preposition in a prepositional phrase headed by *to* takes on the thematic role of a goal. Thematic roles are not raised in the literature to describe the meanings of *at*, as within the standard set of thematic roles the only applicable role would be location. The location role, however, does not distinguish among the simple locatives and can assigned to the complements of *in*, *on*, *behind*, *above*, and many other prepositions in addition to *at*. In keeping with the literature, I will use thematic roles to discuss the basic meaning of *to* but not of *at*. Further in this exploration, however, I will use thematic roles to explain the semantic behavior of *at*, as well as *to*, in certain contexts.

Gruber and Bennett also both argue that there is a strong connection between *to* and the locative *at*, noting that the two prepositions appear in the same contexts and denote similar relations. Working within frameworks which theorize the existence of deep structure and surface structure, Gruber and Bennett disagree as to the ways in which the underlying structures of 'locative' and 'goal' interact with one another and eventually influence the resulting surface structures. Gruber argues that the underlying form of 'to' has a tendency for deletion, and thus while it is relatively prevalent in deep structure, *to*

has a tendency not to appear in a sentence's surface structure. Bennett rejects this theory, noting that there are sentences in which *to* is necessary and cannot be deleted, but puts forth no competing account for why the underlying 'goal' concept is "realized" in the surface structure sometimes as *to* and sometimes as *at*. Gruber and Bennett's identification of *to* as relating to a goal role will be accepted here, but the framework under which they operate will not be. The idea of a connection between *to* and *at* will be left as an open question.

Leech (1970, p. 191) also posits a relationship between *to* and *at*, describing *to* as the "dynamic equivalent" of *at*. While this analysis is similar to Gruber or Bennett, Leech justifies his differently, pointing not to underlying structures or similar usages but to logical implication:

(24) *Matt has gone to the station.*
(25) *Matt is at the station.*

Leech argues that because (24) logically implies (25), *to* must therefore be the motional equivalent of *at*. This argument takes for granted the notion that Gruber (1970, p. 52) makes explicit, that there is some underlying form of 'at' associated with the preposition *to*. Gruber indeed goes so far as to assert that there is an underlying form of 'at' associated with almost all prepositions, but Leech does not comment on this position.

While Leech's description of the relation between *to* and *at* might be accurate, his justification is flawed. First, (24) does not entail or logically imply (25), as something could have happened to Matt en route to the station that would not make the speaker of (24) a liar or even mistaken. One could conceivably require that the speaker of (24), in order to be considered sincere, must expect Matt to successfully arrive, but even that expectation is not a logical consequence of (24). One could sincerely utter (24) but expect, due to a snowstorm for instance, that Matt might not successfully arrive at the station. Further, consider:

(26) *Matt was going to the station.*

(26) uses the same preposition, *to*, as (24), and cannot be said to logically imply (25), and additionally does not even carry the expectation of Matt's successfully arriving at the station, as in (24). The only difference between (24) and (26) is in their respective aspects; the former is perfect while the latter is progressive. Thus it is the aspect of the verbs in (24) and (26), rather than the choice of preposition, that dictates the sentences' logical relation to (25) and the expectations one might require a speaker to have.

Despite Leech's method of justification, his analysis seems sensible. *To* seems to involve movement, be it physical or metaphorical, from one location to another, the final location of which can be described by *at*. This analysis can be easily reconciled with those of Gruber and Bennett, who assert that *to* signals a goal role. While not true in all cases, there are many contexts in which the entity that is ascribed the goal role under Gruber and Bennett's theory also occupies the same final location, or in fact is the final location which is then described by *at* under Leech's theory.

In summary, *to* is identified in the literature as a marker of relationships that occurs with verbs involving motion or direction, and indicates the direction of that motion. *At* also has a directional sense, as well as a simple locative sense (its "core" sense). I presume, and will establish below, that it is the directional sense of *at* which occurs in sentences (1) and (2). If both prepositions denote direction of motion, then why or how do these two sentences have different meanings? This is the question I will address in section 3.

3. A comparative analysis of *to* and directional *at*: Verbs of Throwing

We proceed by investigating specific verb classes whose members allow both *at* and *to*, in the attempt to identify the semantic differences between sentence pairs involving this alternation. The identification of verb classes is based on Levin 1993. I

begin with the class of verbs of throwing, then move on to other verb classes whose members describe directional motion.

Throw is the archetype of the class of "Verbs of Throwing". This class has 30 members, which are described as verbs of "instantaneously causing ballistic motion". All of these verbs can take both *to* and the directional *at*.

(27) *John catapulted/flung/hurled/punted/tossed the book to Mary.*
(28) *John catapulted/flung/hurled/punted/tossed the book at Mary.*

Note that any entity placed into the non-agentive theme role (first *the ball*, now *the book*) will allow this alternation; the verbs of throwing are not simply a set of actions we associate with balls, as we certainly don't associate punting with books, and yet both (27) and (28) allow this combination.

As we have concluded that *at* has two distinct senses, our first task is to establish which sense of *at* occurs in the variants of (28). One might posit that *at* functions here in its simple locative sense to pick out one of the endpoints of the path invoked by the main verb. While a simple locative could be used to describe either of the endpoints of the path from John to Mary (namely John and Mary themselves), it is not the simple locative *at* in use in (28). *John flung the book* describes one endpoint of the path without the use of *at*, so the addition of *at* cannot further denote that same endpoint. Adding a phrase like *but it hit the lamp* or *but he missed* to the end of (28) removes Mary as the endpoint of the path being described, yet even with those additions the prepositional phrase *at Mary* carries meaning. *At* must therefore be contributing meaning other than the simple locative, and indeed it is the directional *at* in these cases.

Because the simple locative is not used to describe motion along a path, it is the directional *at* that can be found alongside path-denoting verbs. Any inherently motional verb that allows *at* will trigger the directional use of *at*, leaving the simple locative interpretation available but marked. The availability of the locative interpretation can be

demonstrated by adding a locational context to *at* when it follows a path-denoting verb, as below:

(29) *Teddy threw the rock at the river.* [directional *at*]

(29b) *Where did Teddy do his rock throwing?*

Teddy threw the rock at the river. [locative *at*]

Verbs that do not describe motion along a path, on the other hand, trigger the core simple locative sense of *at*, making it the primary reading of the sentence.

(30) *The snake slithered at the mouse.* [directional *at*]

(31) *Sam will eat at the airport in Chicago.* [locative *at*]

Being inherently motional verbs, the verbs of throwing trigger the directional sense of *at*.

3.1 Participatory & non-participatory goals

Having established that the *to*/*at* alternation is present in this verb class, and that the default sense of *at* in use with these verbs is directional, we can turn to the different readings available to *to* and *at* with these verbs. First, let us characterize which types of complements these two prepositions allow. *At*, when paired with the verbs of throwing, can take noun phrases that refer to both animate and inanimate entities as prepositional complements:

(32) *John threw the ball at the coach.*

(33) *John threw the ball at Fido.*

(34) *John threw the ball at the library.*

The same is true when the preposition *to* is paired with these verbs of throwing:

(35) *John threw the ball to the coach.*

(36) *John threw the ball to Fido*.

(37) *John threw the ball to the library.*

The interpretations among these last three cases are subtly different. The unmarked reading of (35) is that John threw the ball intending and in such a way that the coach would catch it; the same is true of John and Fido in (36). And looking again at (27), we can see that this reading is not a consequence of the verb *throw* nor of the set of actions we associate with balls – the same interpretation would arise if we used *toss the book* – but rather this interpretation is related to the associations established by the preposition *to*. The unmarked reading of (37), on the other hand, does not give rise to the expectation that John intended the library to somehow receive the ball, nor that he threw it in just such a way. Rather, (37) allows only a purely spatial interpretation, and is identical to *John threw the ball as far as the library*.

We can see, further, that this spatial interpretation demanded by (37) is also available to (35) and (36). When put in the proper context, the spatial interpretation can become the primary reading of these sentences:

(35b) *How far did John throw the ball?*
John threw the ball to the coach.

(36b) *How far did John throw the ball?*
John threw the ball to Fido.

(37b) *How far did John throw the ball?*
John threw the ball to the library.

In this particular context, primed by the spatial question *how far*, the spatial readings of (35) and (36) become clear. This test also demonstrates that there is no difference between the contextually-cued reading of (37b) and the uncued reading of (37), confirming the assignment of the spatial interpretation as the unmarked reading of (37).

When animate indirect objects (whether human or non-human) are the complements of *to* and the arguments of verbs of throwing, then, there are two readings available. Only the spatial interpretation, however, is available to inanimate indirect objects. This difference is illustrated further by imagining additional contexts for (35) and (36); if the coach or Fido are dead, for instance, then the normally unmarked interpretation of those sentences is no longer available. The sentences are forced into their spatial interpretations, as in (35b) and (36b). The same results are rendered if the context is not that the coach and Fido are dead, but that they are asleep, or even if they are known to not be paying attention, i.e. if they are not able to be active participants in the event. All of these contexts force the spatial interpretation of (35) and (36), as in (35b) and (36b).

The different interpretations available to these sentences can be described as a difference in thematic roles, a difference between what I will call a *participatory goal* as opposed to a *non-participatory goal*. In the unmarked readings of (35) and (36), the coach and Fido respectively are taken to be participatory goals; their participation, whether it results in successful catching or not, is expected. In (37), however, without anthropomorphizing or extending animacy to the library, we cannot assign it the thematic role of a participatory goal. *The library* must instead be a non-participatory goal, and therefore the only interpretation available is the spatial *How far* interpretation, as that interpretation does not require the indirect object to perform any action. The library serves only as a marker of distance and does not need to be active to fill that role.

This novel thematic role distinction also explains the effect that various non-spatial contexts can have on (35) and (36). If the entities represented by the indirect objects *the coach* and *Fido* are known to be dead, asleep, or otherwise unable to take part in the action at hand, then by their very nature they cannot be participatory in that action. They must therefore be taken as non-participatory goals, and are left with only the spatial interpretation that does not require their active involvement.

Not only does this distinction between participatory and non-participatory goals account for the various behaviors of (35)-(37) in the contexts presented above, but it can also be generalized to the entire class of verbs of throwing when paired with *to*.

(38) *John tossed the scraps to the dogs.*

(39) *John launched a potato to Louisiana.*

(40) *John hit the ball to the outfield.*

The dogs in (38) are taken as participatory and are expected to receive the scraps, unless we know them to be dead or asleep, at which point the dogs are only a distance marker. Louisiana and the outfield, in (39) and (40), are inanimate and so cannot be participatory, and therefore can only be distance markers for the spatial interpretations of (39) and (40).

We have, then, established two types of readings available for *to* when paired with verbs of throwing: participatory readings, in which *to* indicates a participatory goal, and spatial readings, in which *to* introduces a non-participatory distance marking goal. For the most part, these readings are mutually exclusive; participatory readings are non-spatial, and spatial readings are non-participatory. These readings can be demonstrated by applying the *How far* (spatial) test and the *dead/asleep* (participatory) test. There may, however, be contexts in which these two interpretations are used simultaneously.

Having established that *to* can introduce both participatory and non-participatory (spatial) goals, I will demonstrate that *at* can introduce only non-participatory goals. When paired with *at*, the verbs of throwing do not exhibit the same distinction between animate and inanimate indirect objects as they do when paired with *to*. Adding the contextual knowledge that the coach in (32) were dead, for instance, does not change the interpretation of the sentence. Considering sentences (32)-(34), we see that verbs of throwing with *at* have the same reading for both animate and inanimate indirect objects.

(32) *John threw the ball at the coach.*

(33) *John threw the ball at Fido.*

(34) *John threw the ball at the library.*

The *at* in these examples does not encode the simple locative, but rather the non-core directional sense of *at*. As discussed above, this shift is a result of *at*'s being paired with an inherently motional verb.

The one sense of *at* that is at use in (32)-(34) is not the same as either of the uses of *to* as laid out above. This directional *at* cannot be identified with the participatory interpretation of *to*, as in (35), (36), and (38), as the interpretations of (32)-(34) are not changed by imagining that the coach (in (32)) is dead or asleep. The *throw at* interpretation is also not the same as the non-participatory spatial interpretation that could serve as a response to a *how far* question, as in (37), (39), or (40). None of the sentences (32)-(34) could serve as sensible answers to the question *How far did John throw the ball?* Like the spatial *throw to* interpretation, however, the readings for the *throw at* cases are distinctly non-participatory, as the readings of (32) and (33) remain unchanged even if the coach and Fido are asleep or known not to be paying attention. So while *to* can introduce either participatory or non-participatory goals, *at* can indicate only non-participatory goals. This distribution of *to* and *at*, when the prepositions head phrases that are arguments of verbs of throwing, is laid out in Table A.

	participatory goal	non-participatory goal
spatial	(to)[2]	to
non-spatial	to	at

Table A. The distribution of *to* and *at* with verbs of throwing

In introducing this new distinction between participatory and non-participatory goals, I argue that the existing thematic role distinctions do not adequately account for the different senses of *to* and *at* in the contexts discussed here. According to Saeed's

[2] As discussed above, the spatial and participatory goal uses of *to* seem to be mutually exclusive. If there were a context in which an entity were filling the roles of both participatory goal and spatial distance marker, I expect that such an utterance would use *to* to introduce those simultaneous relationships. In the meantime, this *(to)* is included to fill out the set, but in fact may never occur.

definition of the goal thematic role, the indirect objects of (32)-(42) would all be classified as goals. The sub-categorization of participatory and non-participatory goals, as proposed here, allows us to distinguish between the entities that in their unmarked state are assumed to be alive, awake, and paying attention to the action at hand, as in (35) and (36), and those entities that have no part in the action, as in (39) and (40). Another proposed subdivision of the goal role, due to Andrews (1985), created the thematic role *recipient*, defined as "a participant who 'gets' something". Andrews's role would allow for the distinction between the purely spatial interpretation of *throw to* and the other readings (all of which would otherwise be classified together as goals), but it would not differentiate between the goals which have different expectations of participation. The coach in (35) and the library in (37) would both be classified as recipients, even though there are different intuitions as to the relationships between the entities described in those two sentences.[3] The distinction between participatory and non-participatory goals allows us to account for the difference of interpretations between (35) and (37), as above, as well as for the behavior of the prepositions *to* and *at* in other contexts which I will investigate below.

3.2 The punitive sense of at

In addition to introducing non-participating goals, *throw at* seems to convey a sense of punitivity, certainly not part of the core sense of *at*. One expects the agent of a sentence that uses a verb of throwing with *at* to be upset with the indirect object, or to be acting in a hostile manner. This punitive aspect is not encoded by *at* itself, but instead arises out of context and the participative distinction described above. Given that an entity is the goal of a directed movement but is not participating in that event, the intuition often rises that the action is punitive, aggressive, or somehow against the wishes of the entity.

(32) *John threw the ball at the coach.*

[3] Andrews's recipient role does have other strengths and explanatory power. For instance, the subject of *Catherine contracted the flu* could be described as a recipient, a more fitting description than actor or goal.

(33) *John threw the ball at Fido.*

(34) *John threw the ball at the library.*

The animacy of *at*'s argument, as well as contextual clues such as that entity's not paying attention to the event, make this punitive sense especially strong. The punitive sense is determined by context, which is in turned informed by the fact that the directional *at* can only introduce non-participatory goals. Because this punitivity is dictated by context, however, we can see examples where this directional *at* does not connote any punitivity.

(41) *Bill threw the dart at the dartboard.*

(42) *While playing dodgeball, Kendra threw the ball at David.*

The knowledge that an entity's thematic role is as the non-participatory goal of a directed movement often gives rise to a sense of punitivity, but this is not always the case. This sense arises out of context, as opposed to being encoded by the preposition itself.

Just like the directional *at*, the preposition *to* can introduce non-participatory goals; their meanings overlap in that both can be used to introduce non-participatory goals. Unlike *at*, however, even when *to* introduces non-participatory goals it does not convey the same punitive sense as *at*. When *to* introduces non-participatory goals, it carries a spatial meaning, and those utterances can function in a spatial *How far* context. *At*, on the other hand, cannot express the same spatial sense; no sentences using the directional *at* can function in the same spatial *How far* context. It seems as though while *to* conveys a spatial sense, *at* has no such broad additional sense to convey. As such, in such environments where the functions of *to* and *at* overlap, *at*'s meaning narrows and it acquires its punitive sense through context. The questions of why *at* cannot be used in the same spatial sense as *to* and why *to* can convey such a spatial meaning will not be addressed here.

If this participatory/non-participatory explanation for the behaviors of *to* and *at* is correct, the same patternings should be found in other contexts. First, we may expect to

find a similar distinction between participatory and non-participatory goals in contexts where both *to* and *at* are allowed. Similarly, in contexts in which either only *to* or only *at* are allowed, we may expect that the context itself should allow only participatory or only non-participatory goals (respectively). We may also expect to find a punitive sense associated with non-participatory goals with *at* but no such punitive sense with *to*. It is in the interest of substantiating this proposal that I will now examine the behaviors of *to* and *at* in contexts beyond the verbs of throwing.

4. Examining additional contexts

4.1 Verbs of speaking

First, let us examine another of Levin's verb classes, the verbs of speaking. This class includes not only those verbs associated with human communication, such as *stutter* and *shout*, but also those normally restricted to animals, such as *bleat* and *squall*, as well as those verbs that can be applied to both humans and non-humans.[4] There is a certain similarity between the way English deals with verbs of speaking[5] and verbs of throwing. As mentioned earlier, Lakoff and Johnson (1980) identify a "COMMUNICATION IS SENDING" metaphor prevalent in English. Verbs of speaking are also similar to verbs of throwing in the ballistic quality of the transmission; while the motion triggered by verbs of throwing is physical as opposed to the metaphorical motion of verbs of speaking, in both classes the agent ceases to be able to influence the entity which takes on the role of direct object after the initial moment of contact. A quarterback can no more change the direction of a ball in mid-air than a speaker can decide who should or should not receive her message after it is uttered.

Like the verbs of throwing, the verbs of talking can take prepositional objects headed by either *to* or *at*.

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[4] This class as will be explored here is actually composed of two of Levin's classes: "talk verbs" (which includes only *talk* and *speak*), and "verbs of manner of speaking" (which includes 77 verbs). (1993, pp. 95)

[5] While it might seem convenient to label this class of verbs "verbs of communication" as opposed to "verbs of speaking", this label would be misleading. The word *communicate* itself does not trigger the same metaphor of ballistic motion as *speak*, but connotes a more direct transmission than *speak* does.

(43) *Greg talked to Susan for half an hour.*

(44) *Greg talked at Susan for half an hour.*

(45) *Helen hollered to Roger from across the street.*

(46) *Helen hollered at Roger from across the street.*

Verbs of talking can take not only animate, but also inanimate indirect objects, with both *to* and *at*.

(47) *Frank talked to the wall.*

(48) *Frank talked at the wall.*

(49) *Steven wailed to the moon.*

(50) *Steven wailed at the moon.*

Unsurprisingly, there is a difference in meaning between the uses of the verbs of talking when paired with the two prepositions. In (43), for instance, Susan is taken as actively contributing to the conversation, while in (44) the focus is on Greg's aggressive, possibly punitive manner of unidirectional talking; Susan needn't be so involved. With a slight change in context, the contrast between these interpretations becomes much clearer:

(43b) *Greg talked to Susan for half an hour; she enjoyed the dialogue.*

(44b) # *Greg talked at Susan for half an hour; she enjoyed the dialogue.*

With the added contextual information that Susan was enjoying the dialogue, (43b) still makes sense. Even though Greg is the subject of the sentence, Susan is a participating member of the dialogue. (44b), however, can only be uttered ironically or infelicitously. Because *at* introduces only non-participatory goals, we know Susan not to be an active party to the action at hand. As such, it seems strange to refer to such a one-sided event as a dialogue. Only if the word choice of *dialogue* and Susan's enjoyment of the event are used ironically does (44b) seem possible.

Sentences (45) and (46), with the verb *holler* rather than *talk*, show a similar difference in interpretation. In (45) the focus is on Helen's attempt to get Roger's attention, while in (46) the focus is on the punitive manner in which Helen hollers. Here, too, the addition of context makes these differences clearer:

(45b) ? *Helen hollered to Roger while sitting right next to him.*
(46b) *Helen hollered at Roger while sitting right next to him.*
(45c) *Helen hollered to Roger nicely.*
(46c) # *Helen hollered at Roger nicely.*

While (46b) remains sensible even with the addition of the context of close proximity, (45b) seems odd in the same context. Unless the event takes place in an especially loud location or Roger is known to be hard of hearing, it seems odd that Helen would choose to shout to attract Roger's attention. Helen's shouting in (46b), on the other hand, is unchanged by the addition of context, namely of Helen's new proximity to Roger. From the addition of *nicely* in (45c) and (46c), we see the punitive aspect of Helen's shouting which is indicated by *shout at* but not by *shout to*, as this punitive sense is contradictory to and therefore cannot sensibly coexist with the word *nicely*.

Among the verbs of talking too, then, the preposition *at* acquires a sense of punitiveness. *To*, when paired with these verbs of talking, can take both participatory goals (as in (43) and (45)) and non-participatory goals (as in (47) and (49)) as prepositional complements. Because there can be no simple locative sense associated with these verbs of talking (as one cannot designate a single point as the target of one's sound waves, but rather only a direction oriented toward a goal) and because non-participatory goals are already associated with the preposition *to*, *at* takes on this additional punitive sense. The question of whether this acquisition in the context of verbs of talking is the result of a parallel semantic acquisition process as described in the context of verbs of throwing or the result of applying the acquired meaning of *at* in that verb class to this class via analogy can only be addressed historically, and will not be answered here.

4.2 Verbs of change of possession

The distinction between participatory and non-participatory goals also explains the behavior of *to* and *at* among verbs of change of possession. These verbs, like the verbs of throwing, often describe motion along a path and always denote at least one of the endpoints of that path.

Among these verbs of change of possession, there is a neat divide between those verbs that allow the preposition *to* and those that do not.

(51) *I sent the package to Walter*.
(52) **Walter received the package to me.*
(53) *Thomas delivered the letter to the Congressman's office.*
(54) **To the Congressman's office accepted the letter.*
(55) *The merchant sold some lotion to Sarah.*
(56) **Sarah bought some lotion to the merchant.*

The cases in which the subject of the sentence is also the agent of the verb are the cases that allow the preposition *to*. The same is true for all agentive verbs of change of possession, such as *give*, *award*, *transfer*, and many others. Only *bestow* and *endow*, which seem to idiomatically require the use of *upon*, are agentive but do not allow *to*. Sentences with patientive verbs, on the other hand, those who subjects are patients rather than agents, do not allow *to*. This difference in behavior is a consequence of the core sense of *to* as identifying a goal. With the agentive verbs of this class, *to* picks out the endpoint of the change of possession, the recipient of the transfer. With patientive verbs, however, the subject of the sentence is itself the goal and cannot be identified again with a prepositional phrase.

While the agentive verbs of change of possession allow *to*, none of the verbs of this class allow the use of *at*. This fact can be explained by the distinction between participatory and non-participatory goals. As postulated, *at* can only introduce non-

participatory goals. While it seems as though there is a limit to how much participation the goals are allowed, in fact the goals of verbs of this class must all be participatory. If I know that Walter is dead, for instance, then I cannot felicitously say (51). So while it might seem counterintuitive that Walter is a participatory goal if he is (alive and) unaware that I am sending him a package, we can see by changing the context that he must indeed be a participatory goal. Other verbs of change of possession, like *buy* or *sell*, more plainly require participatory goals. Because *to* can introduce both participatory and non-participatory goals, it can be used with this class of verbs. *At*, on the other hand, only introduces non-participatory goals, which are here disallowed by the verbs themselves.

	participatory goal	non-participatory goal
spatial	(to)	to
non-spatial	to	at

Table B. The distribution of *to* and *at* with verbs of change of possession

4.3 Verbs of motion

Another context in which the distinction between participatory and non-participatory goals can be applied is among the class that Levin calls "agentive verbs of manner of motion" (Levin 1993, pp. 265-6). These verbs, including *amble*, *climb*, *run*, and *shamble*, describe the way a person (or other animate object) actively moves. These verbs all allow the preposition *to*, which in turn can take both animate and inanimate complements.

(57) *Grant backpacked to Michigan.*

(58) *The gazelle loped to the clearing.*

(59) *The man staggered to the nurse.*

In these examples, and indeed across the entire class of verbs, *to* encodes a spatial meaning, a measure of distance. This point is illustrated by placing these sentences in explicitly spatial contexts.

(57b) *How far did Grant backpack?*

Grant backpacked to Michigan.

(58b) *How far did the gazelle lope?*

The gazelle loped to the clearing.

(59b) *How far did the man stagger?*

The man staggered to the nurse.

The spatial interpretations associated with these sentences are in fact the only interpretations available. Unlike the verbs of throwing, the agentive verbs of manner of motion do not permit the non-spatial use of *to*, the use associated with a participatory goal. The agentive verbs of manner of motion can only be used to describe a certain event type, one that can't actively involve more than one entity. Because they can only describe one participant, there must be no participatory goal role. *To*, therefore, can only be used to introduce spatial relationships.

In addition to *to*, some of the agentive verbs of manner of motion allow the directional *at*. The question of why some of these verbs do not allow *at* will not be addressed here, but I will address the character of the use of this *at* where it does appear. Below are a few examples of the directional *at* with this class of verbs:

(60) **Brad ran at the basketball court.* [allowable only as simple locative]

(61) *Brad ran at the referee.*

(62) *Brad ran at the wall.*

(63) **The bear lumbered at the campsite.* [allowable only as simple locative]

(64) *The bear lumbered at the campers.*

(65) *The missile zoomed at the wall*.

When paired with inherently motional verbs, as discussed above, the directional sense of *at* is triggered. That is to say, when alongside a such a verb, the directional sense of *at*

becomes the default unmarked reading. The simple locative sense of *at* remains available, however, and can be encouraged by context, as can be seen below:

(60b) *Where did Brad do his running?*
Brad ran at the basketball court. [now unmarked]
(63b) *Where did the bear do its lumbering?*
The bear lumbered at the campsite. [now unmarked]
(65b) *Where did the missile do its zooming?*
The missile zoomed at the wall.

The verbs of motion also exhibit the same contextual punitive sense as the verbs of throwing. (61), (62), and (64) demonstrate that the directional *at* in these contexts acquires a punitive connotation. Because *at* signals a non-participatory goal, it is clear that this goal, the referee in (61) for instance, is not involved in the action at hand. The exact means by which the existence of a non-spatial non-participatory goal cues a punitive interpretation remain unclear. There is, however, a strong correlation between the existence of such a goal and this punitive sense. And while the punitive sense may be overridden by context, as with the verbs of throwing, the non-participatory nature of the goal cannot. The preposition *at* signals the relationship between the characters, and context contributes the further sense of the aggressive or punitive manner of the action. This same contextual process occurs with all agentive verbs of manner of motion when paired with the directional *at*.

The nature of the events that agentive verbs of manner of motion can describe, along with the analyses of the readings available to *to* and *at* above, leave the following picture of the prepositions' behavior with this class of verbs:

	participatory goal	non-participatory goal
spatial	(to)	to
non-spatial	to	at

Table C. The distribution of *to* and *at* with agentive verbs of manner of motion

4.4. Verbs of nonverbal communication

The final class of verbs I will consider are the verbs of nonverbal communication, including *beckon*, *gesticulate*, *gesture*, *motion*, *nod*, *signal*, and *wave*. These verbs are distinct from Levin's "verbs of nonverbal expression" (1993, pp. 98) and in fact are not classified by Levin.[6] Just like the verbs of speaking, these verbs are inherently (metaphorical) path-denoting verbs and thus trigger the directional sense of *at*.

This class is problematic in that *to* and the directional *at* can be used in the same contexts and, for many native English speakers, contribute the same meaning. Further complications arise as native speakers have mixed responses to various uses of the two prepositions. For the most part, however, both *to* and the directional *at* can be used with animate prepositional complements.

(66) *Eli motioned to Barbara.*
(67) *Eli motioned at Barbara.*

For some native speakers, both *to* and the directional *at* can be used with inanimate prepositional complements.

(68) ? *Carl nodded to the door.*
(69) *Carl nodded at the door.*

While informal polling suggests that there is some disagreement, some native English speakers allow both prepositions to be used alongside sentential complements.

(66b) *Eli signaled to Barbara that it was time to leave.*
(67b) ? *Eli signaled at Barbara that it was time to leave.*

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[6] *Nod* and *wave* are classified as "wink verbs" along with *blink*, *clap*, *point*, *shrug*, *squint*, *wag*, and *wink*, each of which are associated with a particular body part (including the tail, in the case of *wag*). These verbs are listed because they have "reaction object" constructions, as they express reactions such as approval, disapproval, assent, admiration, or disgust.

Those speakers who disagree on this point accept (66b) but reject (67b). These inconsistent but overlapping intuitions make it difficult to develop a theory about the use of these prepositions with this class of verbs.

There is, however, one question with respect to which native speakers agree. Asked to interpret the following two nearly-identical sentences, respondents shared the same intuition.

(70) *Moe motioned at Larry to Curly.*

(71) *Moe motioned to Curly at Larry.*

Cued not by the sentences' word order but by the prepositions, native English speakers agree that in (70) and (71) Moe is indicating in the direction of Larry in the midst of a conversation with Curly. Moe is making reference to Larry, whose awareness of Moe's action is not necessary for the sincere utterance of (70) or (71). Larry, introduced by the directional *at*, is the content of Moe's message. Larry's role is that of a non-participatory goal. Curly, on the other hand, is the recipient of the message. While Curly's participation is not necessary for the sentence to be uttered felicitously, it is allowable.

At least in this respect, then, the verbs of nonverbal communication are consistent with the schema proposed above. Despite the confusion regarding some of the uses of *to* and *at* with these verbs, the distinction between participatory and non-participatory goals has explanatory power in this context as well. While *to* can be used to introduce either a participatory goal (the recipient of a non-verbal message) or a non-participatory goal (the content of such a message), the directional *at* can only introduce a non-participatory goal.

5. Conclusion

As I have demonstrated, this novel distinction between participatory and non-participatory goals allows for a better understanding of the behaviors of *to* and *at* in

linguistic environments that allow both prepositions. This distinction provides insight into the dual senses which *to* can convey as well as the relatively narrow use of *at*. In addition to verb classes that exhibit *to*/*at* alternations, this participatory/non-participatory distinction illuminates the intrinsic character of verb classes that allow only one of these two prepositions.

Thematic roles can help us not only in categorizing the functions of entities in an event, but also in understanding the semantic contribution of prepositions and the character of verb classes themselves. And while the standard set of thematic roles, such as agent, patient, theme, and goal, do help to explain some such linguistic behaviors, there is insight to be gained from exploring further and distinguishing between more specialized thematic roles. Applying this participatory/non-participatory distinction and other such specialized thematic roles to other linguistic environments would continue to help clarify the behaviors and semantic uses of a variety of linguistic expressions.

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