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Simulated Manual Interaction as the Conceptual Base for Reference and Predication: A Cognitive Grammar Analysis of the Integration Between Handling Gestures and Speech

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SPEECH**

by

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**B.A., LINGUISTICS AND SPANISH, UNIVERSITY OF NEW
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ABSTRACT

Prior research on representational hand gestures has shown that an object's affordances influence both the likelihood that it will be indexed in a representational gesture, and the form of the gesture used to refer to it. Objects which afford being held are associated with higher gesture rates than objects which do not afford being held. Further research has shown that the ways humans prototypically interact with an object also influence the reference technique used to refer to that object through a hand gesture. An object that people interact with manually will tend to be indexed through a gesture imitating the action associated with interacting with the object (called an acting gesture), while an object that people do not normally interact with manually will tend to be indexed through gestures depicting its shape (called molding and drawing gestures). Results from studies looking at neuroimaging and gesture production suggest that these differences in representation techniques are the result of the simulated action of

interacting with the referent of the gesture. This aligns with Cognitive Grammar's claim that an utterance's profile is construed in relation to its conceptual base. Using data from narrations of the *Pearl Film*, this study proposes a subtype of acting gesture—here termed *handling gesture*—and analyzes its various grammatical functions. It posits that the handling gesture is used to profile the various elements within a manual interaction event—which include an object that affords manual interaction, an agent, and the action the agent performs on the object. By applying theory from Cognitive Grammar and conceptual integration to an analysis of the handling gesture, this paper argues that handling gestures are used to construe physical objects as participants of manual interaction events and to establish an utterance's schematic structure, which is elaborated by the speech.

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Chapter 1

Introduction

The present study provides a grammatical description of a specific type of gesture, herein called the *handling gesture*. It is defined as a subtype of the *acting* gesture category as described in Müller's (2014) typology. While acting gestures metonymically depict any action as performed by the hands, handling gestures specifically depict the way one would grasp and manipulate an object. Based on prior research on gesture production and object affordances (Masson-Carro et al 2016; Hostetter 2014; Pine et al 2010), this study assumes that the production of a handling gesture stems from the simulated action of interacting with an object. Using Langacker's (1987) theory that the profile of an utterance is construed in relation to a cognitive base, this study posits that the conceptual base of the handling gesture is the simulation of a manual interaction event. The manual interaction event includes the conception of an object, a human agent, and the action the agent performs on the object.

Chapter 2 provides a background in gesture research and embodied cognition, as well as a description of cognitive grammar. Experimental research on the relationship between acting gestures, object affordances, and sensorimotor simulation suggests that humans simulate actions associated with objects when conceptualizing and talking about those objects. As humans also depict more gestures depicting these actions when thinking and talking about these objects, it is likely that these gestures are the product of sensorimotor simulation. A description is also given of components of cognitive grammar

and conceptual integration that are relevant to a grammatical description of the handling gesture.

Chapter 3 describes the methodology used for this study, which provides a qualitative analysis of two conversations in which two college undergraduate students discuss *The Pear Film* (Chafe 1980). Using a video as a stimulus for the conversations provided for multiple instances between the two conversations in which the participants referred to the same objects and predicated the same events. By using conversational data, this study analyzes the handling gesture as it occurs naturally. A definition of the *handling gesture* is provided, which specifies the handling gesture as a subset of acting gesture, in which the speaker profiles a scene featuring a person interacting with an object manually through a grasp handshape.

Chapter 4 provides a qualitative description of the handling gesture and the contexts in which it occurs. The form of the gesture is described as having two component structures—a grasp handshape which corresponds to an object, and a movement which corresponds to a manual interaction with an object. Of these two component structures, the grasp handshape is autonomous, in that it can occur independently. This chapter also discusses the contexts in which the handling gesture occurs. It is used for describing objects that afford manual interaction, describing events in which characters manually interact with objects, and occasionally for reintroducing characters into the discourse. Changes in the form of the gesture do not seem to correspond to these differences in profiling the different elements of a manual interaction event. Rather, they seem to correspond to the particulars of the objects and events themselves, and to granularity in the construal of the event.

Chapter 5 discusses the theoretical implications of the data. First, it argues alongside Langacker (1987, 2008) that reference to objects and predication of events profile different elements of the same conceptual base. This provides support for Langacker's (2008:105) claim that *things* are "product[s] of grouping and reification." Second, it argues that the theory of conceptual integration (Fauconnier & Turner 1998) explains the integration of gesture and speech. It is argued that the integration with speech provides for the referential or predicative function of the gesture. Third, this chapter argues that the autonomy/dependency alignment (Langacker 2008) of gesture and speech suggests that gesture establishes the schematic substructure of an utterance, which is elaborated by the speech. Rather than merely illustrating what the speaker says, gesture provides the conceptual base from which the sentence is derived.

Chapter 2

Literature Review

2.1 Traditions in gesture description

McNeill (2005) presents four dimensions that he uses to describe hand gestures. The first dimension, *iconicity*, refers to correspondences between the form of the gesture and the entity or event being described. This can be iconicity between the shape of an object and the handshape used or outline traced with the forefinger. It can also be an iconic relationship between an event, such as using a tool, and repeating the actions one would take to use that tool.

The next dimension, *metaphoricity*, is similar to *iconicity* in the forms one would use to represent an object or event. But the distinction here is that the objects and events being described through the gesture are not physical. Aspects like space, shape, and movement can be mapped onto an abstract concept so that it can be represented physically through gesture.

The third dimension McNeill (2005) discusses, *deixis*, refers to any spatial assignment used in a gesture. This is seen most apparently in pointing gestures, both when a speaker indexes an object by extending their hand and forefinger toward it, and when they use the space in front of them to make spatial distinctions between two or more objects or concepts. As McNeill (2005) writes, *deixis* is always situated according to an *origo*—or deictic center. The *origo* is the viewpoint from which spatial assignments are determined. To point at an object, for instance, the speaker sets a trajectory from their own body, which leads to the object. While gesturing an event, such as putting a lid on a

jar, the spatial assignment is still situated from the speaker's body, representing the body of the person reportedly performing the action.

The last dimension McNeill (2005) describes, *beats*, are repetitive movements signifying emphasis in the speech channel. Beats usually co-align with the prosodic stress patterns of the utterance. Beats are not meaningless, but as McNeill (2005) writes, they serve to mark that what the speaker is saying is important.

It is important to note that these four dimensions are not categories. They can be represented at various levels in any given gesture. In the jar-lid example given above, for instance, the hands representing the action of holding a jar and twisting a lid are iconic, while the orientation of the jar and lid with relation to the body are deictic. A speaker can point at an object while simultaneously performing beats with their pointing hand.

One theoretical issue with this model is that the iconic and metaphoric dimensions are based on the physical properties of the referents, rather than on the formal properties of the gestures themselves. According to this framework, two gestures could be formally identical, and yet be treated as different types of gesture based on the physical nature of the referent.

Another issue is that the iconic dimension is far from descriptive. Iconicity can be mapped onto any feature of a gesture that has a similarity in form to its referent. And this iconicity does not just need to be the physical shape of an object. Iconicity can be mapped onto spatial assignment in deixis. It can also be mapped onto the source domain of a metaphoric gesture. But even with physical objects and events, there is significant variability in the manner a speaker chooses to use gesture for reference.

Müller (2014) and Kendon (2004) provide an alternative framework for describing gesture, through what Müller terms *representation modes*. She gives four different categories: acting, molding, drawing, and representing (Kendon calls these enactment, depiction, and modelling). In *acting*, the speaker refers to an object or event through the manual activities associated with that object or event. This includes grasping, holding, using an object, and performing an action. For *molding*, the speaker refers to an object by shaping the contour of the referent with the palms of their hands. For *drawing*, the speaker traces the outline of an object or the trajectory of a path using their forefinger. Lastly, for *representing*, the speaker allows their hands to embody the object. They may model the shape of the object with the shape of their hand, as with using a flat handshape to represent a flat object, or they may simply use their hand to stand in for an object, as with using the index finger to stand in for a person. Kendon (2004) refers to molding and drawing gestures together as *depiction*, representing gestures as *modelling* gestures, and acting gestures as *enacting* gestures. To avoid ambiguity, this paper will use the term *modelling* rather than *representing*, but will maintain Müller's term for *acting* gestures.

Müller (2014:1692) posits that these modes are not just for *iconic* gestures, but apply to how gestures are used in general—in reference, metaphor, and managing discourse, for instance. According to her framework, gestures are motivated by metonymy (Müller 2014:1962). Through *abstraction* and *schematization*, each representation mode selects the meaningful aspects of a sensorimotor experience and reproduces them in different ways. For *representing* gestures, the most prominent aspects of an object's shape represent the whole object. For *molding* gestures, the most salient parts of an object's surface are used to refer to the whole object. For *drawing* gestures,

the outline of an object represents the whole object, and the trajectory of an event represents the whole event. For *acting* gestures, the most salient aspects of interacting with an object are used to refer to either the whole action or the object itself.

Lastly, Müller writes, *molding* and *drawing* gestures can be considered subsets of the *acting* mode, since for all acting, molding, and drawing gestures the speaker's hands portray hands in action. Whether the speaker is referring to an entity or predicating an event, they do so by presenting the actions of the hands. In *representing* gestures, however, the speaker's hands portray the entity to which they are referring.

2.2 Acting gestures and embodied simulation

Several models for gesture production hypothesize that speakers produce gestures as a result of *embodied simulation* (worthy of note is the Gesture as Simulated Action Hypothesis, as proposed by Hostetter & Alibali 2008). Embodied simulation, also called *mental imagery*, is when a person imagines a sensorimotor experience, without actually experiencing it physically. Embodied simulation can be divided into two categories: *sensory simulation*, which occurs when a person imagines perceiving something through the senses, and *motoric simulation*, which occurs when a person imagines performing some action. When a person simulates action, the areas in their primary motor cortex associated with performing that action become active, but the muscles receive no signal to perform that action (Bergen 2012).

Research on humans' ability to conceptualize objects has shown that the type of object a person is conceptualizing will influence their mental imagery. For instance, Gerlach et al (2002) have shown that when categorizing objects, people will have more

activity in their premotor areas if the objects they are categorizing can be interacted with manually than if the objects are not prone to being manipulated. The size of an object can also influence a conceptualizer's mental imagery. As Glover et al (2004) show, when a person is thinking about an object, the size of that object will influence the initial size of their grasp aperture when reaching for a different object. And the depth of a person's experiential knowledge of an object will influence the way they conceptualize it. As Weisberg et al (2007) show, people are faster at performing mental rotation tasks with pictures of objects they have used before versus objects they have never used. Furthermore, their premotor areas show more activity when performing these tasks for objects they have used than for objects they have not used. These three studies show that when people think about an object, they think about how they would interact with it using their hands.

Simulated action in turn manifests itself through gesture. When people perform tasks that require an increased cognitive load, their tendency to use gesture increases. This is evident in an experiment run by Chu and Kita (2016), in which they had participants perform mental rotation tasks and then talk about them afterward. For those tasks which required the most cognitive effort (those in which the image was rotated further, and along multiple axes), people produced more gestures, both when performing the tasks silently, and when talking about them. And just as Weisberg et al (2007) show that experience of an object influences how strongly people simulate when thinking about it, Cook and Tanenhaus (2009) show that the kind of experience people have with a concept will influence the way they gesture about it. After completing the Tower of Hanoi puzzle, either with physical disks or on a computer, their participants explained

how it was solved. Those who had completed the puzzle with physical disks were more likely to use acting gestures to describe their movements, while those who had completed it on the computer were more likely to use drawing gestures to trace the trajectory of moving the pieces.

Some researchers have also studied how affordances influence gesture directly. Chu and Kita (2016) also found that people are less likely to use gesture in mental rotation tasks when the objects in the images are less prone to being held. They compared gesture rates for when people mentally rotated a coffee mug versus when they mentally rotated a similar mug with spikes imposed on it, and found that people gestured significantly less when the mug had spikes protruding from it. Pine et al (2010) and Hostetter (2014) compared the gestures of people describing objects to people who could not see them and found that they used more gestures when describing objects that are used with the hands (such as tools) than they did for objects that are not used with the hands. In a similar study, Masson-Carro et al (2016) had people rate the objects they used for how highly they were associated with manual interaction. Rather than looking at how often people gestured in general when describing these objects, Masson-Carro et al (2016) compared how much people used the *representation modes* presented in Müller (2014). They found that while drawing and representing gestures were infrequent for describing objects, people used more acting gestures to describe objects they would use with their hands, and more molding gestures to describe objects they would not use with their hands.

2.3 Cognitive Grammar

Langacker (1987, 2008) describes two types of neural events that serve as the foundation of cognitive grammar. They are, respectively, the conceptualization of things and relationships. Things and relationships, as Langacker (2008) defines them, are maximally distinct. The prototypical thing is bounded in space and unbounded in time, while the prototypical relationship is bounded in time and unbounded in space. Things are conceptually autonomous, while relationships are conceptually dependent on their participants. That is, an object can be conceived outside of any relationship, while a relationship cannot be conceived without also conceptualizing the entities that participate in the relationship (Langacker 2008:104).

Conceptualizing a thing involves two basic concepts: grouping and reification (Langacker 2008:104-5). When multiple mental experiences are perceived to be similar in proximity or quality, they are subject to being grouped and conceptualized as a unitary whole. Langacker (2008:105) provides the following figure (Figure 2.1) to explain this. In (a), the two dots on the left can be conceptualized as a group while the three dots on the right can be conceptualized as another group. This is possible because the dots in these two groups are closer together in proximity than the dots in the opposing groups. It would be strange to group the leftmost and rightmost dots together, to the exclusion of the other three dots, because the leftmost and rightmost would not be perceived as being similar in proximity in relation to the other three dots.

Similarity in quality is also an important factor of grouping. In (b), six of the dots are black, while the rest are white. This similarity allows for them to be attuned to more specifically, and allows for them to be grouped together. Their spatial proximity also

allows for them to be grouped further, such that there could be two groups of black dots, one on the left, and one on the right.

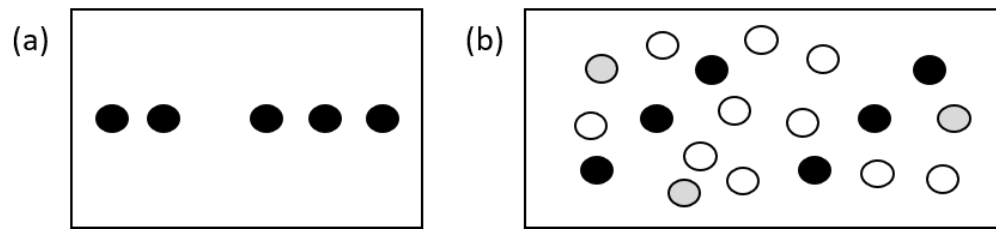


Fig. 2.1. Grouping. Adapted from Langacker (2008:105). The dots in (a) are grouped according to spatial proximity, while the dots in (b) are grouped according to similarity.

More ordinary examples of grouping could include a musical phrase or a song repertoire. A musical phrase consists of multiple mental experiences (i.e. notes), which are construed as occurring together. Because of their temporal proximity, they are grouped together as a single unit. A repertoire is another case of grouping similar mental experiences. The songs that build up the repertoire are conceived as being similar mental experiences, and because of this similarity they are able to be construed as a single unit.

The process of reification is defined as the “capacity to manipulate a group as a unitary entity for higher-order cognitive processes” (Langacker 2008:105). Reification is what allows a conceptualizer to construe a conceptual event as a thing. While processual relationships are construed as events unfolding through time, a conceptualizer may shift the profile such that the event is construed holistically rather than dynamically. By doing this, the conceptualizer can group the experiences together as a single unit. This provides for certain noun phrases such as *running* or *morning routine*, which are series of events that are reified and grouped together as a single unit.

A core component of reification is metonymy (Langacker 2008:119). By shifting the profile from the dynamic nature of an event to a holistic view of it, the process can be

construed as a member of a part-whole relationship between an event and its participants. The participants can be included in the holistic grouping, as with the nouns *game* and *presentation*, or they can be profiled as participants of the event, as with the nouns *player*, *speaker*, and *audience*. As will be shown in chapters 4 and 5, objects that afford manual manipulation are subject to reification when a speaker refers to them through a handling gesture.

The second type of neural event, the conceptualization of relationships, relies on the cognitive ability to apprehend relationships and track relationships through time (Langacker 2008:108). Whereas a thing is a grouping or reification of cognitive events, a relationship is the conceptualization of an interconnection between cognitive events (Langacker 2008:108). Langacker (2008) distinguishes between three types of relationships: simplex relationships, complex non-processual relationships, and processual relationships (or processes). These three types of relationships can be illustrated with the words *in*, *into*, and *enter*. The word *in* profiles a simplex relationship, in that there is no change or dynamic component in the conceptualization. For *into*, the relationship involves the conceptualization of multiple simplex relationships without profiling the temporal component, and is therefore considered a complex non-processual relationship. For the word *enter*, however, the relationship is construed as taking place over time, and is therefore considered a process. As this work analyzes gestures depicting manual manipulation of objects, the focus will be on processual relationships.

Any given expression has as its scope the conceptual base from which the profile is selected (Langacker 1987:183). For many expressions, such as those which describe

manipulable objects and the ways one may interact with them, this conceptual base is an event, comprised of a relationship and its participants.

A construction can be defined simply as a pairing between a linguistic form and its meaning. This pairing occurs at many different levels of language, however. The form itself consists of multiple component constructions. At the morphemic level, for instance, phonemes occur in a specific order to correspond to a meaning. Words consist of morphemes, which when blended together correspond to another meaning. Words are placed into certain grammatical patterns which also correspond to their own meanings.

A more detailed description of constructions needs to be divided between two planes. First, Langacker (2008) refers to symbolic structures, which are the association between a phonological structure and a semantic structure. Phonological structure refers to the linguistic form. It can be a morpheme, a word, a grammatical phrase, a sentence, or even a segment of discourse. Semantic structure refers to the concept associated with the phonological structure. The word *cat*, for instance, is the pairing between the phonological structure /kæt/ with the concept CAT. At the grammatical level the symbolic structure which Goldberg (1995) calls the ditransitive construction has as its phonological structure an English verb followed by two noun phrases, with the associated meaning of transfer of property.

Second, Langacker (2008) refers to component and composite structures. When symbolic structures are combined, they become component structures, which make up larger composite structures. As component structures are each their own symbolic structure, they supply their own meaning to the composite structure. The meaning of the composite structure is not simply a combination of the meanings of the component

structures. The meaning that arises from the composite construction is what Langacker (2008) refers to as an emergent structure.

For instance, when the verb *kick* occurs in the ditransitive construction *kick him the ball*, the symbolic structures of *kick* and the ditransitive construction do not just combine to mean ‘transfer of ownership by way of kicking’. The meanings of *kick*, *ball*, and the ditransitive construction all blend to create the emergent structure of a play made during a soccer match.

As Langacker (2008:199-200) describes, some constructions are conceptually autonomous—that is, they can be conceptualized without being elaborated by another construction—while other constructions are conceptually dependent—that is, they cannot be conceptualized without being elaborated. We can see this distinction in things and relationships. While thing can be conceptualized autonomously of any relationship, a relationship cannot be conceptualized without reference to its participants. *Throw*, for instance, must include an agent and patient in its conception, while *pitcher* and *ball* do not need to be instantiated within an event of throwing in order to be conceptualized.

Dependent components in a construction usually establish a schematic substructure which must be elaborated by the autonomous component (Langacker 2008:201). For instance, prepositional phrases consist of a preposition, which is dependent, and a nominal, which is autonomous. As the dependent component of the construction, the preposition establishes a schematic substructure—usually defining a spatial relationship—which is elaborated by the nominal. If we consider the phrase *in the box*, we can see that the image evoked by the preposition is highly schematic. It establishes a substructure in which an entity occupies space within a container. The

container, however, remains unspecified. It could be a prototypical container, such as a box; it could be any other object, such as a body or sofa; it could even be a mental state, such as love or pain. *The box*, though still schematic when construed in isolation, specifies the substructure provided by the preposition. The nominal slot in this construction serves as an *elaboration site* (Langacker 2008:198)—a position within a construction in which a dependent component has a schematic landmark, which is elaborated by the autonomous component.

2.4 Conceptual Integration

A central factor in the composition of constructions is called conceptual integration. Without it, as Turner (2007) argues, we would need independent words for every single concept. Because we have an infinite set of possible referents—real or imaginary—and a finite set of tools to refer to them, this would be impossible. We need other strategies to construct meaning. Rather than using a set of fixed terms which always convey the same meaning, conceptual integration provides for a set of linguistic forms which are highly malleable depending on the context. This can be seen in the relationship between argument structure constructions and the verbs that occur within them: If an intransitive verb like *sneeze*, for example, occurs in a caused motion construction, as in *Sam sneezed the napkin off the table*, the conceptualizer can simulate a scene in which Sam sneezes, causing the napkin to blow off the table (Goldberg 1995).

A multimodal view of construction grammar should also account for conceptual integration. As Kelly et al (2010) and Özyürek (2014) write, the mind works to integrate the two signals perceived through speech and gesture into a single signal. According to

their analyses, hearers understand speech and gesture pairings more quickly and accurately if they share a higher semantic congruence. Just as Goldberg's (1995) argument structure constructions feature semantic frames, manual gestures feature frames governed by the sensorimotor simulations they evoke.

As discussed in Fauconnier and Turner (1998), conceptual integration occurs when at least two conceptual domains are juxtaposed. These are called the input frames. Elements within these frames which share similarities across the frames are called cross-space mappings. These are represented by the solid line in Figure 2.2. Elements which are not shared between the input frames are abstracted away, leaving the generic space, which informs the structure of the blend. The blend is created through the selective projection of elements from the input frames, which involves three processes.

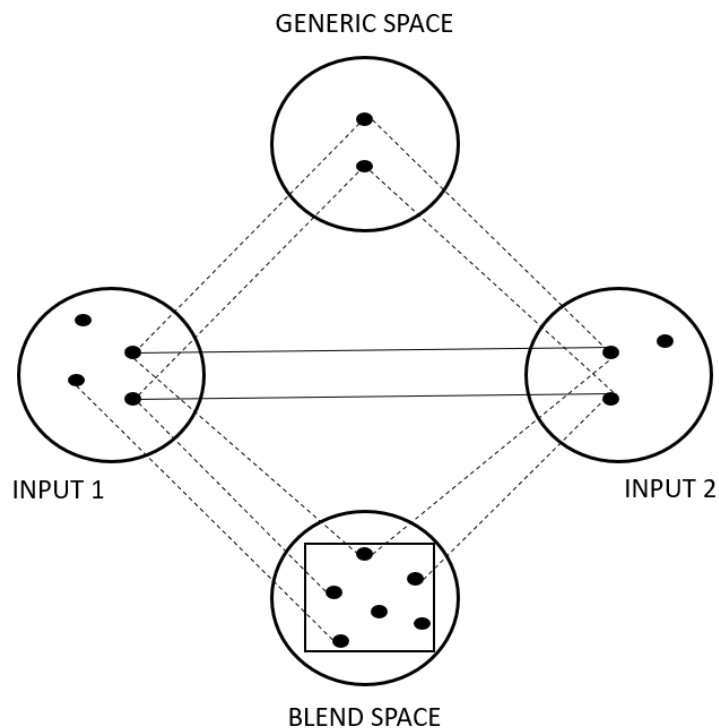


Fig. 2.2. Conceptual Integration. Adapted from Fauconnier and Turner (1998:143). The circles represent mental spaces, while the dots represent elements within them. The solid lines represent correspondences, and the dashed lines represent projections.

First, through composition, elements from the separate frames can be either fused into a single element or distinguished as separate elements. Relations between these elements are established which do not exist in the input frames. Second, through completion, the blend conforms to patterns present in external background frames, such as the previous discourse frame (cf. Langacker 2008). Third, through elaboration, the conceptualizer exploits mental simulation to enrich the details of the blend.

2.5 The Present Study

As discussed above, several researchers have analyzed the role that object affordances have on gesture production (Masson-Carro et al 2016; Hostetter 2014; Pine et al 2010). Gesture rates increase when people talk about objects that afford manual manipulation, and the forms of these gestures tend to represent manual action more closely than gestures about objects that do not afford manual manipulation. While informative, these studies do not describe the form of acting gestures in detail, and they provide little description of the function of these gestures.

The finding that people tend to use more acting gestures when talking about objects that can be acted upon does not necessarily entail that people use gestures to refer to these objects. For most of the experiments cited above (Hostetter 2014; Pine et al 2010), participants were not permitted to refer to the objects by name. It is likely that the participants were talking about how to use the objects instead of describing them. In this case, they would not have been using acting gestures while talking about objects, but rather while talking about performing manual actions. Although participants in Masson-

Carro et al's (2016) study were allowed to use the names of the objects, the authors did not include the co-occurring speech as part of their analysis.

By comparing handling gestures with their co-occurring spoken phrases, the present study shows that handling gestures are used for both describing objects and how to use them. People perform handling gestures when referring to objects that afford manual interaction, and they perform handling gestures when predicating events in which people interact with these objects manually. Additionally, people use these gestures on some occasions when reintroducing a character into the discourse.

Although the handling gesture occurs in cases of both reference and predication, there are no formal differences which suggest that the function of the construction is to refer in one context or to predicate in another; rather, its function is to establish the schematic substructure of the utterance, using the schematic image of a person manually interacting with an object as its conceptual base. The present study provides a formal and semantic description of the contexts in which this construction occurs and discusses three avenues through which it can inform cognitive grammar and gesture theory. First, this study provides support for Langacker's (2008) claim that conceptual *things* are products of grouping and reification, by showing that gestures encoding action refer to physical objects and people through reification of a manual interaction event. Second, by applying frame blending theory, this study shows that the integration between speech and gesture provides the profile of the gesture. Third, this study argues that as the dependent component of an utterance, gesture establishes the schematic structure which is elaborated by the speech.

Chapter 3

Methodology

The data used for this study are two recordings of undergraduate students at the University of New Mexico. Each recording shows two students discussing *The Pear Film*, which was developed by Chafe and colleagues (see Chafe 1980 for a description of their respective projects using the film).

3.1 Stimulus

Using a video stimulus for narration serves several functions. First, it enables the researcher to elicit specific conversation topics indirectly. The researcher can use a video that will reliably elicit certain types of conversation. For instance, McNeill (1992:365) points out that a Tweety and Sylvester cartoon will elicit more concrete gestures, while the Hitchcock film *Blackmail* will elicit more metaphoric gestures. By controlling for the semantic content of the narrative, the researcher can elicit specific structures. If the semantic content of the narrative features more objects, the speakers will be more likely to use handling gestures, whereas if the semantic content of the narrative features more abstract concepts, the speakers will be more likely to use abstract gestures. Second, by controlling the semantic content of the narrative through a video stimulus, the researcher can compare the grammatical structures used to describe one concept across multiple speakers. Third, using a stimulus video enables the researcher to see the source of what the speaker is describing. The profile of a gesture is not always obvious from the speech

alone, so the video serves as a vital tool in understanding how the speaker has conceptualized an event (McNeill 2005).

The Pear Film was designed to be used as an input stimulus to analyze how people verbalize their experiences. The developers noted that a given experience may be verbalized in various ways, even by the same speaker, and wanted to design an input that could elicit verbalizations of the same experience across various speakers of various languages (Chafe 1980:xi-xii). They included in the film a variety of events involving people and objects which had different levels of salience and which might elicit a variety of coding strategies. *The Pear Film* provided a useful stimulus for the present study, as it features many events of humans interacting manually with small objects. This allowed for several instances of participants talking about small objects, the people interacting with them, and the actions performed on them.

The film begins with a man picking pears from a pear tree while standing on a ladder. He wears an apron that has a pouch in the front of it, and as he picks the pears he puts them in his pouch. He comes down the ladder and empties the pouch into one of three baskets filled with pears. He climbs back up the ladder. A man walks by leading a goat on a leash, and then a boy enters the scene riding a bicycle. Seeing the pears, he sets down the bicycle and contemplates stealing one. He looks up at the man in the tree and then decides to steal a whole basket of pears. He picks his bicycle back up, picks up a basket of pears, balances it in the front of his bicycle, and then rides away. As he is riding, a girl comes riding her bicycle in the opposite direction. He looks at her as they pass, his hat falls off, and then he collides with a rock in the middle of the path. He falls, and the basket of pears spills onto the ground.

Three boys are standing nearby and one of them is playing with a paddleball. They help him pick up the pears and put them back into the basket. The boy brushes off his knees and continues on his way, before the boy with the paddle whistles for his attention. He is holding the hat which had fallen on the ground. He gives the hat back to the boy with the bicycle, who gives him three pears in exchange. The three boys who had helped him then walk back in the opposite direction, toward the pear trees, eating their stolen pears. The man picking the pears comes down from the ladder and notices he is missing a basket. He then sees the three boys walking by eating pears and watches them walk off into the distance.

3.2 Participants

Three females and one male participated in the study. The average age was 20.25 years, and the participants were all right handed. Three of the participants reported English as their native language; while P4 reported Amharic as her native language, she self-rated herself as highly proficient in English (5 out of 5 on a Likert scale). The participants were each compensated \$10.00 for participating in the study. See Table 3.1 on the next page for a summary of each participant's biographical information.

| Participant | Age | Gender | Native Language | Second Language (Proficiency*) | Handedness |
|-------------|-----|--------|-----------------|---|------------|
| P1 | 21 | Female | English | Chinese (3/5) Spanish (2/5) | Right |
| P2 | 20 | Male | English | Towa (2/5) Chinese (1/5) Hebrew (1/5) | Right |
| P3 | 20 | Female | English | Spanish (3/5) | Right |
| P4 | 20 | Female | Amharic | English (5/5) ASL (1/5) | Right |

* Proficiency was self-rated on a 5-point Likert scale, with 1 representing low proficiency and 5 representing high proficiency.

Table 3.1. Participant Information

3.3 Procedures

Prior to the recordings, one of the participants (P1 and P3, respectively) watched *The Pear Film* through YouTube on a laptop computer, being instructed to pay special attention to the characters, events, and storyline of the film. They were then instructed to describe the film to the other participants (P2 and P4, respectively) in as much detail as they could, focusing on the characters, events, and storyline of the film. P2 and P4 were not permitted to see the film until after the narration task took place. They were encouraged to discuss the film with their partner until they had a good understanding of the story. The researcher left the room during the recordings to avoid influencing the conversations. The conversations were recorded using a SONY HDR-CX160 video camera, and lasted 12min, 32sec and 5min, 33sec, respectively.

3.4 Data Analysis

The recordings were analyzed using ELAN software. Separate annotation tiers were used for speech transcription and gesture category. Speech was divided into intonation units and transcribed at the lexical level. Pauses were included in the transcription, but not timed. Speech segments that co-occurred with gestural phrases were underlined, and segments that co-occurred with gesture strokes were double-underlined.

Gestures were segmented according to their strokes. Following McNeill's (1992) description of a gestural phrase, strokes were considered to be the part of the gesture in which the hands exhibited a directed and intentional movement. Similarly to Ruth-Hirrel and Wilcox (2018), the beginning of a gesture stroke was identified as the first frame in which the hand was blurred and the end of a stroke was identified as the first frame in

which the hand was not blurred, showing the beginning and end of the movement. The end of the gesture hold was identified as the last frame in which the hand was not blurred—that is, the following frame showed hand movement that either marked the beginning of a new gesture stroke or the movement toward a rest position.

Only handling gestures that were used to profile concrete objects or manual events with concrete objects were selected for analysis. Metaphorical instances of handling gestures, and acting gestures that did not index an object through a grasp handshape, were excluded. For instance, in line (411), P1 produces a handling gesture in which she construes the storyline of the film as an object that can be grasped and moved to another location:

- | | | | | |
|-------|----|---------|---------|---|
| (409) | P1 | 07:14.4 | 07:17.3 | yeah so it it switches from like the kid getting the pear |
| (410) | P2 | 07:17.3 | 07:17.6 | mhmm |
| (411) | P1 | 07:17.7 | 07:18.5 | <u>to um</u> |
| (412) | | 07:18.6 | 07:20.1 | back to the guy picking the pears |



(411) to um

Because the storyline is not a physical object, and the event of switching from one scene to another is not a physical manual interaction event, this gesture was coded as metaphorical and excluded from the analysis. Other instances of acting gestures did not qualify as handling gestures because they marked an event that did not involve manual

manipulation of an object. In line (365), P1 produces a handshape that encodes the action of whistling:

| | | | | |
|-------|----|---------|---------|------------------------------------|
| (363) | P1 | 06:24.3 | 06:24.8 | and it shows |
| (364) | | 06:24.9 | 06:25.8 | well it doesn't show him whistling |
| (365) | | 06:25.8 | 06:26.7 | but he <u>whistles</u> |



(365) but he whistles

While the fingers may interact with the mouth in the encoded event, they are not involved in manipulating an object, and the gesture does not encode an object through a grasp handshape. Because it lacks a grasp handshape, it is categorized as an acting gesture, but not as a handling gesture.

For an instance to be categorized as a concrete handling gesture, it needed to fit two criteria. First, it needed to match the formal definition of the handling gesture (described in section 4.1), which requires a handshape resembling a grasp and a motion resembling a manual interaction with an object. While the form of the motion component needs to be highly schematic in order to allow for the wide variety of ways a person may move an object, the form of the grasp component may be defined with more precision: the handshape must feature hand curvature and an opposed thumb.¹ Possible handshapes include A, S, C, claw-5, small-O, F, and flat-O. Specificity of handshape in this

¹ It is possible to interact with objects without prehending them. A drop of mercury, for instance, might be held with an open hand with an upward palm orientation, without curvature or an opposed thumb (Sherman Wilcox, pers. comm.). For this reason, *handling* and *interaction* refer specifically to the *manipulation* of objects.

construction is not highly grammaticalized, however, so it is necessary to allow for variety in the form: The set of objects one may interact with forms an open class, whose members may have a wide variety of shapes and therefore afford a wide variety of grasp paradigms.

This formal definition allows us to distinguish between gestures that co-occur with similar predicates, as shown in lines (221) and (225):

| | | | | |
|-------|----|---------|---------|-----------------------------------|
| (221) | P2 | 04:01.8 | 04:02.7 | he's <u>picking pears</u> |
| (222) | | 04:02.7 | 04:04.2 | he has a red bandana |
| (223) | | 04:04.2 | 04:05.2 | and a wide brimmed hat |
| (224) | P1 | 04:05.5 | 04:05.9 | mhmm |
| (225) | P2 | 04:05.9 | 04:07.0 | and he's like <u>picking them</u> |



(221) *he's picking pears*



(225) *and he's like picking them*



While both lines encode a manual interaction event, the gesture in line (221) does not adhere to the formal definition of the handling gesture. The handshape features neither curvature nor an opposed thumb, and is therefore not interpreted as encoding a manual interaction event. The gesture in line (225), however, does fit the formal definition. The

thumb is opposed, the fingers are curled in, and the movement encodes a trajectory compatible with the act of picking fruit.

But the form of the handshape and movement alone do not provide enough information to determine whether an instance should be included in the category. A gesture which formally contains a grasp component may not necessarily be used to describe a manual interaction with an object. Thus, the second criterium is that the conceptual context of the utterance must contain a manual interaction event or an object that can be manipulated manually. While this context is often provided in the speech, McNeill (2005:259-60) argues that deriving the semantic content of a gesture solely from the spoken component of the utterance creates a circular fallacy. If gestures are only analyzed based on the co-occurring speech, then no meaning can be derived from them other than what occurs in the speech. By comparing gestures to the stimulus video, however, the researcher can see the source of the conceptualization and deduce more complex meanings from the concepts encoded by the gestures. The conceptual context, therefore, is not necessarily the information provided in the discourse, but that provided in the stimulus video.

For instance, in lines (235) and (237) the gesture features a grasp handshape, but the conceptual context does not contain information compatible with a manual interaction event:

| | | | | |
|-------|----|---------|---------|---|
| (233) | P1 | 04:15.2 | 04:17.2 | i think he's like blond dirty blond something like that |
| (234) | P2 | 04:17.2 | 04:18.2 | so he's like a |
| (235) | P1 | 04:18.0 | 04:19.1 | <u>and maybe</u> |
| (236) | P2 | 04:18.2 | 04:19.5 | like a white kid kinda thing |
| (237) | P1 | 04:19.2 | 04:19.6 | <u>yeah</u> |



(235) and maybe

The handshape P1 uses features both opposed thumb and hand curvature, but the conceptual context contains only the boy's physical appearance. While the character does interact with objects in the film, such as baskets, pears, a bicycle, and a hat, it is not likely that P1 is conceptualizing these things while describing his hair. It is possible that she is conceptualizing a grasp—though likely with a metaphorical referent—but the conceptual context does not provide enough information for this instance to be analyzed as a handling gesture.

In sum, instances of the handling gesture must fulfill two criteria. They must contain a grasp component which features an opposed thumb and curvature of the hand, and they must occur in conceptual contexts that provide either a manual interaction event or an object that affords manual manipulation. As will be discussed in the next chapter, it is not necessary for the form of the grasp or motion to be compatible with the objective shape or trajectory of the object or event. There are several instances in which the handshape encodes a shape that does not fit the shape of the object, or in which the motion encodes a trajectory that does not fit the trajectory of the hand movement in the stimulus video. The criteria provided above allow for this mismatch, as the form of the gesture is not dependent on the semantic content of the speech. By allowing for a mismatch between form and objective information, these criteria include instances of

gesture in which the speaker's portrayal of the scene is motivated by conceptual semantics, rather than objective reality.

Chapter 4

Data Description

4.1 Form of the Construction

The form of the handling construction has two components. The first component, the handshape, specifies the type of grasp one would use to hold an object. The second component, the motion, specifies the action one would perform on the object. Of these two components, the handshape is the autonomous structure, while the motion is dependent. As can be seen in Figure 4.1, the phonological structure of the handshape component is a type of grasp, while its semantic structure is an object which affords the represented manual interaction. The phonological structure of the motion component is depicted action, while its semantic structure is to specify the nature of the manual interaction.

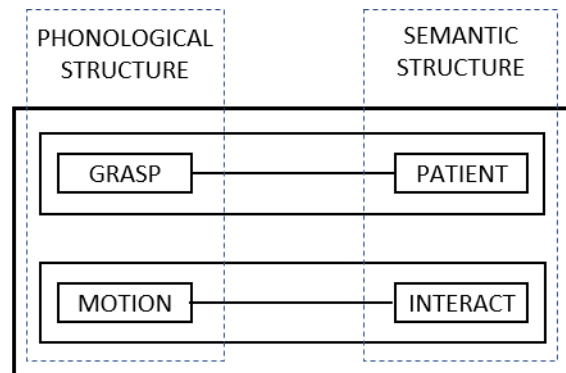


Fig. 4.1. The Handling Gesture Construction

While both of these components can be fairly schematic in form, there are some regularities. The handshape requires an opposed thumb and some curvature of the fingers

in order to be interpreted as a grasp. The level to which they are curved, however, is not constrained. It can take the form of a closed fist, a hand tightly closed with the thumb pressed against the back of the forefinger, a hand held loosely open with all of the fingers curled inward, or a hand mostly open, with the fingers only bent slightly. These handshapes prototypically encode the shape of the object they represent, but not necessarily so. While closed hands are usually used to represent narrow objects, they can also be used to represent larger objects with a more schematic construal.

The motion component encodes the speed, duration, and trajectory of the manual interaction, among other physical properties such as repetition, spatial relationships between entities, and non-manual information relevant to the event, such as movement of feet or the whole body. The form assumed by the motion component depends largely on the physical properties of the event described, and therefore does not have a singular pattern. Like the handshape, though, the form of the motion can be schematized to alter the construal of the event. Verb aspect can be encoded through repeating the movement or through abstracting the trajectory of the movement to be presented as a cyclical.

Put together, the grasp and motion components of the handling gesture profile the manual interaction event that is elaborated in the utterance. The scope of this profile includes an object that affords manual interaction, the manual interaction it affords, and an agent who performs the event on the object. Although there are only two component structures in the construction, corresponding to the object and the event, the emergent structure provides for the agent to be profiled as well. As relationships are conceptually dependent on their participants (Langacker 2008), a manual interaction event must be performed by an agent. Thus, while there is no component within the handling gesture

construction that refers to an agent directly, an agent is necessarily evoked. This agent, however, may remain unprofiled in the utterance.

4.2 Objects, Events, and Agents

4.2.1 Paddle Ball

One of the more salient objects in the pear story is a paddle ball. As it turns out, this object seems to be difficult to name. The first time it occurs in each conversation, the participants use fairly elaborate gestures to make sure the addressee understands what they are talking about. But they do not only use this gesture while describing the object. It is also used when predicating that one of the boys is playing with it, and it is used while referring to the boy himself in contexts of reintroduction.

When she first refers to the paddle ball, P3 performs a handling gesture that lasts over five seconds of discourse. Beginning in line (693), she produces a handling gesture with a closed fist and her palm oriented downward; she moves her wrist up and down to imitate the action of hitting a ball with a paddle. In line (693), this gesture co-occurs with the nominal *paddle board*, which is the object of the possessive verb *has*. She continues producing the same gesture through line (697), where she starts to repeat the utterance, but stops to give a parenthetical statement to agree with P4, by saying *doesn't make any sense*. When she produces this utterance, she holds the gesture, and then resumes the stroke again in line (699), where she repeats *one of them has a paddle board*.

| | | | | |
|-------|----|---------|---------|---|
| (692) | P3 | 01:51.1 | 01:54.1 | and # then there are three boys there |
| (693) | | 01:54.4 | 01:56.4 | and one of them has a <u>paddle # board</u> |
| (694) | P4 | 01:55.9 | 01:56.6 | so confusing |
| (695) | P3 | 01:56.6 | 01:57.1 | <u>yeah</u> |
| (696) | P4 | 01:56.6 | 01:57.0 | okay |
| (697) | P3 | 01:57.1 | 01:57.5 | <u>one of them</u> |

| | | | |
|-------|---------|---------|---------------------------------------|
| (698) | 01:57.5 | 01:58.4 | <u>doesn't make any sense</u> |
| (699) | 01:58.4 | 01:59.7 | <u>one of them has a paddle board</u> |
| (700) | 02:00.2 | 02:01.2 | and they're just all hanging out |



(693) *and one of them has a paddle # board*



(699) *one of them has a paddle board*

Although this gesture may be interpreted as profiling the event of the boy playing with the paddle ball instead of profiling the object, the timing of the gesture indicates that the action is used to refer to the paddle itself, rather than to the event. In the first instance of the spoken utterance, the gesture does not co-occur with the predicate *has*, but rather with the noun phrase *paddle board*. The gesture serves to aid in lexical recall while she figures out what to call the object.

It is also possible that the gesture is used for both in this instance. As the semantic frame of the gesture includes a schematic event, agent, and patient, the event can either be elaborated as the event performed by the boy, or it can be left schematic as the action one would normally use to interact with a paddle ball. In the former case, the event and patient are profiled together; in the latter, the event is used to narrow down the candidates of possible referents. In either case, though, the paddle ball is profiled by the gesture.

In another instance, the handling gesture is used much more clearly to profile the patient of the event. When P1 first introduces the paddle ball in the discourse in lines (295) and (296), she also produces a handling gesture while struggling to access the word used to refer to this object. She uses her right hand with the fingers closed, thumb pressed against the inside of the index and middle fingers, to show that the object has a handle. The palm orientation changes throughout, starting with a downward orientation before she starts speaking, then shifting to an upward orientation when she says *he had* in line (295). She shifts back to a downward orientation when she says *one of those*, and then gradually turns towards an inward orientation by the end of the stroke in line (296). She directs her eye-gaze toward her hand during the beginning of the gesture phrase in line (295), and her wrist continues to move back and forth throughout the stroke of the gesture.

| | | | | |
|-------|----|---------|---------|--|
| (295) | P1 | 05:18.3 | 05:20.2 | <u>he had one of those little like</u> |
| (296) | | 05:20.2 | 05:22.3 | <u>what i think it's like paddle ball or something</u> |
| (297) | P2 | 05:21.6 | 05:22.6 | oh like the _____ |
| (298) | P1 | 05:22.3 | 05:23.7 | with the and it's got the string |
| (299) | P2 | 05:23.5 | 05:23.9 | mhmm |



(295-6) he had one of those little like—what—i think it's like paddle ball or something

By directing her eye-gaze toward her hand, she indicates that she is using the gesture to profile the object, even though she is still trying to think of the word. Once she

remembers the word, she stops gesturing and says *paddle ball or something*. At this point, P2 understands what object she is referring to, but also opts for creating the image with a gesture, rather than referring to the object verbally. He does this in order to show explicitly that he understands what the object is. He grounds the reference with a definite article in line (297), but then produces the gesture without any co-occurring speech, using his right hand with fingers closed and the thumb pressed against the back of the forefinger. The palm is oriented inward, and the forearm moves up and down repeatedly. He also gazes at his hand while producing the gesture.



(297) *oh like the*

While the predication in line (295) is similar to that in line (693) from the previous example, the gestures in this instance are more clearly used for profiling the patient, rather than the event. The paddle ball is the focus from lines (295) through (299). While she is trying to name the object, P1 continues to produce the gesture, indicating that she is using the gesture to facilitate identifying the referent. Additionally, P2 uses the handling gesture to fill the nominal slot in a noun phrase, even though his gesture represents an action. He uses the definite article as a grounding element for the gesture, which he produces without any co-occurring speech.

This image is not only used for profiling the paddle ball, but is also used to profile the event of playing with it. In lines (300) and (301), P1 produces a gesture using her right hand with fingers closed and palm oriented upward. She flicks her wrist upward repeatedly, once again imitating the action of using a paddle ball. The stroke of this gesture occurs throughout the duration of lines (300) and (301). She predicates the event with *doing it up*, which does not encode any manner for the event. Rather, the manner is supplied by the gesture, which portrays the movement of hitting a ball upward with a paddle.

| | | | | |
|-------|----|---------|---------|--|
| (300) | P1 | 05:23.7 | 05:24.5 | <u>and he was like doing it up</u> |
| (301) | | 05:24.5 | 05:26.0 | <u>and like he couldn't do it at all</u> |
| (302) | | 05:26.0 | 05:26.7 | he sucked at it |
| (303) | | 05:26.7 | 05:27.6 | so it fell |
| (304) | | 05:27.6 | 05:29.5 | <u>and so he started doing it with the ball down</u> |
| (305) | | 05:29.5 | 05:31.4 | so he didn't have anywhere to miss |



(300) and he was like doing it up



(304) and so he started doing it with the ball down

She continues in line (304) to describe how the boy switched directions while playing with the toy. This gesture has two strokes: it co-occurs with *and so he started doing it*, and with *down*. She produces the gesture with her right hand, with the fingers closed and the palm oriented downward, her wrist moving back and forth vertically. The gesture pauses while she says *with the ball*, depicting the ball with her left hand. For this gesture, she uses her left hand with the palm oriented upward, and the fingers curled

inward, resembling the grasp one would use to hold a small ball. When she produces the word *ball*, she moves her left hand in a downward trajectory. After this brief gesture, she resumes producing the acting gesture with her right hand, depicting the action of playing with a paddle ball. By holding the gesture for the paddle ball, she shifts the focus to her left hand, allowing it to emphasize that the direction of the ball has shifted to a new direction.

This image schema is also used while referring to the boy who was playing with the paddle ball. As the paddle ball is the most salient thing associated with him in the discourse, it is used to distinguish him from the other characters. In line (721), P3 reintroduces this character to describe a scene in which he picks up the hat belonging to the boy with the bicycle and gives it back to him. She gestures with her right hand, with the palm oriented downward and fingers closed with the thumb pressed against the forefinger and middle finger, moving her wrist back and forth vertically. The stroke of this gesture co-occurs with *boy with the paddle*, and stops when she starts predicating the event of him picking up the hat.

| | | | | |
|-------|----|---------|---------|--|
| (714) | P3 | 02:19.8 | 02:21.7 | that when remember when he was going by the girl |
| (715) | P4 | 02:20.6 | 02:21.6 | when he fell yeah |
| (716) | P3 | 02:21.8 | 02:22.2 | yeah |
| (717) | | 02:22.2 | 02:22.8 | and his hat flew off |
| (718) | | 02:22.8 | 02:23.2 | and he looked |
| (719) | | 02:23.2 | 02:23.8 | and then he fell |
| (720) | P4 | 02:23.7 | 02:24.2 | yeah |
| (721) | P3 | 02:24.3 | 02:26.7 | well so the 1- # <u>boy with the paddle</u> grabs it |
| (722) | | 02:26.7 | 02:27.6 | and whistles at him |



(721) well so the l- # boy with the paddle grabs it

When P1 reintroduces this character, she also uses the paddle ball gesture. In line (360), she produces the gesture using her right hand, with the palm oriented inward at the onset, gradually turning downward through the rest of the stroke. She has her fingers closed and the thumb pressed against the forefinger, moving the wrist back and forth vertically. The stroke of the gesture co-occurs with the phrase *the kid with the paddle* and ends before the speaker finishes the noun phrase with *thing*.

| | | | | |
|-------|----|---------|---------|---|
| (360) | P1 | 06:20.2 | 06:22.2 | the <u>the ki:d with the paddle</u> thing |
| (361) | | 06:22.2 | 06:23.7 | he like puts it in his pocket picks it up |



(360) the the ki:d with the paddle thing

This instance more clearly demonstrates that the main purpose of the gesture is to reintroduce the character, rather than profile the paddle ball. Although the stroke overlaps with the two noun phrases, the rate of the movement is higher while the speaker is referring to *the kid*, and then gradually slows down. When she says *the kid*, P1 raises her arm higher, and then gradually lowers it through the rest of the gesture phrase. She also elongates the vowel in *kid*, to increase the referent's prominence in the utterance.

The referring expression in this utterance is a topical construction. When she predicates the boy's actions in line (361), she refers to him again through the pronoun *he*. Although the semantic content of the gesture is congruent with the content of the modifying phrase, its emphasis is on identifying the correct character, rather than describing his paddle ball.

4.2.2 Picking the Pears

Another image that was used to index all three elements of the schema was the act of picking pears. One of the first scenes of the film shows a man in a pear tree, picking pears and putting them in his apron. When describing this event, P3 produces a gesture with her right hand, with the palm oriented upward and the inside of the arm facing outward. The fingers are spread apart and curled in to show the form used to grasp a round object, and the wrist twists quickly counter-clockwise to indicate the action of picking fruit from a tree.

The stroke of the gesture co-occurs with *pulling* in line (614), and the gesture holds through *pears from*. As the stroke co-occurs with the predicate, it is used to profile the event. The pear and man are both indexed in this gesture, as the handshape represents the shape of the object, and the hand itself represents the man's hand.

| | | | | |
|-------|----|---------|---------|---|
| (613) | P3 | 00:10.4 | 00:11.8 | it started off with this guy |
| (614) | | 00:11.8 | 00:13.7 | he was <u>pulling pears from</u> a tree |



(614) he was pulling pears from a tree

Shortly after she describes this event, P4 interrupts her in line (617) to negotiate the meaning of the word *pears*. It is possible that she has interpreted it as the word *pairs*, and is not sure how to parse the utterance. To clarify what she means, P3 responds in line (619) with *pears—like you know, pears*. As she says this, she produces a gesture with her right hand, reaching up with her palm oriented upward and the inside of her forearm facing outward. The fingers are spread and curled in, again demonstrating the act of grasping a round object. The pre-stroke of the phrase, where she reaches up, co-occurs with the phrase *like you know*, and the stroke, in which she twists her wrist clockwise, co-occurs with the word *pears*.

| | | | | |
|-------|----|---------|---------|---|
| (613) | P3 | 00:10.4 | 00:11.8 | it started off with this guy |
| (614) | | 00:11.8 | 00:13.7 | he was <u>pulling pears from a tree</u> |
| (615) | | 00:13.9 | 00:15.3 | it's a real rural area |
| (616) | | 00:15.4 | 00:16.4 | like there's nothing around |
| (617) | P4 | 00:15.8 | 00:16.3 | pears |
| (618) | | 00:16.3 | 00:17.0 | like |
| (619) | P3 | 00:16.4 | 00:17.9 | pears # <u>like you know pears</u> |
| (620) | P4 | 00:17.2 | 00:18.0 | oh the fruit |
| (621) | | 00:18.0 | 00:18.4 | okay |
| (622) | P3 | 00:18.1 | 00:18.5 | yeah |
| (623) | | 00:18.7 | 00:20.0 | pulling pears down |



(619) pears # like you know pears

Although the gesture demonstrates an action, it is used to profile an object. She constructs a scene of picking fruit from a tree to narrow down the possible meanings of *pear*. P4 understands this to mean the act of picking pears from a tree and acknowledges this in line (620) with *oh the fruit*.

This scene is also used when referring to the man. When she introduces the character in line (093), P1 produces a gesture using both hands, with the palms oriented inward and the fingers closed with the thumbs pressed against the fore and middle fingers. She moves them in a tight cyclical motion, in one full rotation. The stroke of this gesture co-occurs with *the guy* and ends before the speaker says *picking the pears*.

| | | | | |
|-------|----|---------|---------|--|
| (093) | P1 | 01:40.5 | 01:42.2 | so like <u>the guy</u> picking the pears |
| (094) | P2 | 01:42.1 | 01:42.5 | mhmm |
| (095) | P1 | 01:42.2 | 01:42.9 | um |
| (096) | | 01:43.2 | 01:43.7 | he was |
| (097) | | 01:43.7 | 01:44.3 | um |
| (098) | | 01:44.7 | 01:46.4 | thirties i guess |



(093) so like the guy picking the pears

While the gesture demonstrates the action of picking pears, it does not co-occur with the relative clause, but rather with the nominal it modifies. Similar to her other instance of reintroduction, P1 uses a topical construction. She refers to the character first, and then comments on the topic later in lines (096) through (098), indexing him again with a pronoun. The form of the gesture she uses is schematic. The grasp component features a closed fist, which does not represent the grasp one would use to hold a pear. The motion component takes the form of a cyclic, rather than the straight downward trajectory that would resemble pulling something down from an overhead branch. By schematizing the form, she presents the event with less specificity, allowing the event to be construed holistically and to refer to the agent through reification.

4.2.3 Profiling the Agent

While there are only three instances of handling gestures being used to profile the agent of an event in the present data, some observations can be made. First, each instance overlaps with the agent participant in the utterance, which is followed by a modifying construction encoding similar semantic information to the gesture. More specifically, the modifying construction is either a relative clause encoding the event, or a comitative phrase encoding the patient of the event. The gesture stroke does not always align with the modifying construction, although the gesture does encode the modifying information. In each of these cases, the stroke begins with the verbal construction profiling the agent of the event. The event profiled by the main predicate of the sentence, however, is never the event encoded in the gesture.

4.3 Indexing Multiple Elements

While the examples above demonstrate that the handling gesture can be used to predicate events and refer to both patients and agents of manual interaction events, it is not the case that the handling gesture can only profile one of these constituents at a time. As the handling gesture depicts a manual interaction with an object, every instance by definition occurred in a context in which there was an event with a conceptual patient. Although not always indexed in the speech, both the object and manual interaction event are always indexed in the gesture.

While multiple elements can be indexed in the gesture simultaneously, they do not always have the same prominence. In the example in line (619) above, where P3 and P4 are negotiating the meaning of the word *pears*, P3 uses an action to profile the object. Both the event and the object are indexed in this instance, but the object has more prominence. Similarly, in line (710) below, P3 indexes the bicycle with her gesture, even though she does not refer to it as an instrument in the event. She produces the gesture with both hands as closed fists, with the palms oriented inward. She alternates her two hands, moving the right hand forward and the left hand backward, then moving the left hand forward and the right hand backward. The stroke of the gesture co-occurs with the phrase *and he's going*, supplying the manner of the movement in the event by imitating the action of riding a bicycle.

| | | | | |
|-------|----|---------|---------|---|
| (708) | P3 | 02:09.9 | 02:10.7 | dusts him off |
| (709) | | 02:11.1 | 02:13.8 | and they get him back going # on his bike |
| (710) | | 02:13.8 | 02:14.7 | <u>and he's going</u> |
| (711) | | 02:14.7 | 02:16.1 | and the boys walk the other way |



(710) and he's going

By using both hands with fingers closed, she indexes the handlebars of the bicycle. As the gesture co-occurs with the verb *going*, though, the act of riding the bicycle is the element that is profiled by the gesture. Both the event and the object are indexed, but the event is more prominent.

Sometimes, however, the scene can be so elaborate that all of the roles of the schema are highly salient. When describing the scene in which the boy steals the basket of pears, P1 emphasizes that the bicycle is too large for him, that the basket is too large for him, and that the act of balancing the basket while riding the bicycle seems impossible. In lines (210) through (213), her own body embodies that of the boy on the bicycle. In line (210), she reaches to her right with both hands, as though she were about to pick up a basket, but stops in line (211) to gesture the action of balancing the bike. For the most part, the manual aspects of the gesture in line (211) are not visible to the camera. In line (212) she reaches to her right again, with both hands closed, to depict the action of holding two handles. She raises both hands and turns to bring them in front of her. This gesture co-occurs with the phrase *picked up the basket*, with the stroke ending on *the*, and the hold remaining through *basket*. In line (213) she lowers both hands from the hold of the previous gesture, to a position a couple inches above the table. This gesture co-occurs with *put it on the front of his bike*, but the stroke only co-occurs with *put*.

| | | | | |
|-------|----|---------|---------|---|
| (210) | P1 | 03:44.1 | 03:45.2 | <u>and like somehow he like</u> |
| (211) | | 03:46.3 | 03:47.5 | <u>balanced the bike</u> |
| (212) | | 03:47.5 | 03:49.0 | <u>picked up the basket</u> |
| (213) | | 03:49.0 | 03:50.3 | <u>put it on the front of his bike</u> |
| (214) | | 03:50.3 | 03:53.4 | and then started like pedaling off without like ever tipping it over |
| (215) | | 03:53.4 | 03:54.6 | i don't know how he did it but |
| (216) | | 03:54.8 | 03:56.3 | don't know how he fit on that bike |



(211) balanced the bike



(212) picket



(213) put it on the front of his bike



As the stroke in each of the gestures above co-occurs with the predicate, it seems that the most prominent aspect of the scene is the action. It is clear, though, that the boy, bicycle, and basket are all indexed in the gestures as well. These gestures encode much more visual information than the acts of balancing a bike and picking up a basket. As her

body represents the boy's body, it shows that the boy is still on his bicycle when he bends over to pick up the basket. She shows that the basket is large and requires two hands in order to be lifted. The movement of the gesture shows that the trajectory of the action starts from the ground to the boy's right and ends above the bicycle wheel in front of him. She encodes these participants and their spatial relationships through her demonstration of the action.

4.4 Schematicity in Form and Conceptualization

For the more prototypical instances of the handling gesture, the event and grasp are more specified. The handshape depicts a similar grasp to that which would be used to grasp the object, and the movement depicts a similar movement to that which would be used to interact with the object. But, as Müller (2014) writes, acting gestures have a metonymic relationship to the events they describe. The grasp used to pick up an object and the grasp used to refer to it are not one and the same. There are differences in the muscular force applied in the grasp, and the use of negative space between the fingers may not represent the size and shape of the object exactly.

Similarly, the movement used to predicate an action is often a simplification of the movement used to perform the action it predicates.

For example, the gesture one might use to represent the act of swinging a hammer would be similar, but not identical to the actual act of swinging a hammer. To hold the hammer, the fingers would wrap around the handle, but for the handling gesture the hand would likely be fully closed, with the thumb pressed against the back of the forefinger. The motor paradigm for swinging a hammer requires using a certain amount of force to

cause the hammer to move (and to cause it to stop moving). This force would likely not be replicated in the gesture.

While metonymic, the prototypical handling gesture still elaborates some of the details of the event it describes. But these details can be abstracted further, to the point that acting gestures can look fairly different from the events they are being used to describe. For instance, the movement component can take a cyclical form to present the event with lower granularity, even if the action being described does not have a cyclical nature. The handshape, too, can take the form of a closed fist, even when this shape is not compatible with the grasp that would be used to hold the object in reality.

It could be argued that if the form is schematized to the point that the handshape and movement do not iconically represent the shape of the object and the nature of the manual interaction, then the instance should not be categorized as a handling gesture. It is important to note, however, that the iconic relationship between the gesture and the event is gradient. If an exact correspondence is required between the form of the gesture and the form of the action, then—following Müller’s (2014) description of the metonymic relationship—no gesture should be included in the category of handling gestures.

Simplification of the form is an inherent property of acting gestures. What is important for whether forms should be included in the category is whether the handshape encodes a graspable object and the movement encodes a manual event, as described in section 4.1. It will be demonstrated below that schematicity in the form of the gesture is used to adjust the granularity of the construal of the object or the event.

As she summarizes the scene of the man filling his baskets with pears, P3 varies in the levels of schematicity she uses to construct the scene. Starting off in line (643),

there is a mismatch between what she says and what she gestures. The pronoun *them* refers to the baskets of pears, but the gesture she uses encodes the act of putting the pears in the apron instead. She seems to notice this in line (644), where she pauses, and starts adding more detail to the scene.

| | | | | |
|-------|----|---------|---------|---|
| (640) | | 00:45.3 | 00:46.5 | two of them are filled with pears |
| (641) | | 00:46.5 | 00:47.8 | one of them's # being filled |
| (642) | P4 | 00:47.8 | 00:48.1 | okay |
| (643) | P3 | 00:48.5 | 00:50.0 | and so he's <u>filling them</u> |
| (644) | | 00:50.2 | 00:52.4 | <u>he's # putting them</u> in his apron |
| (645) | | 00:52.4 | 00:53.2 | he comes down the ladder |
| (646) | | 00:53.2 | 00:53.9 | he'll <u>look</u> at them |
| (647) | | 00:53.9 | 00:54.8 | <u>put</u> them in the basket |



(643) and so he's filling them

At the beginning of line (644), P3 produces a gesture using both hands. Her hands are open, with fingers spread and slightly curled in, with the palms oriented inward. She moves her hands toward her abdomen, gradually closing them. This gesture co-occurs with *he's*, and then pauses while she stops speaking. At this point she notices that she needs to elaborate on what she said in line (643).



(644) he's #



She continues, saying *putting them in his apron* in line (644). She produces another gesture, reaching up in front of her with her right hand. Her hand is loosely open, with the palm oriented inward. She brings her hand down toward her abdomen while closing her hand and curving her wrist inward to represent the action of picking pears from a tree and placing them in an apron. She holds her left hand near her abdomen, with the fingers spread and slightly bent in, the palm oriented inward. Her left hand creates a space to represent the inside of the apron pouch (as this hand is not performing a handling gesture, it will not be analyzed further). This whole gesture co-occurs with the phrase *putting them*, and ends before the oblique of the sentence, *in his apron*.



(644) putting them in his apron



This gesture is more elaborate than the earlier gesture in line (644), although it is used to mark the same event. Whereas for the first gesture, P3 just marks a trajectory toward her abdomen, in the second gesture, she specifies the trajectory as having a start

point above her head, where the tree branch would be. Her handshape is also more elaborate. She exhibits a grasp that would be used for reaching for an object, and curls her fingers in at the moment her hand starts to come back down again, depicting the action of wrapping her fingers around an object. She makes this scene more elaborate in order to explicitly describe the act of filling the apron pouch with pears, which precedes the act of filling the baskets with pears.

Her next handling gesture, in line (646), is also fairly elaborate, although very short in duration. After coming down the ladder, the man looks at the pears before putting them into the basket. To describe this scene, she uses both hands, fingers spread and bent inward. The gesture begins with both palms oriented downward, and then she turns her wrists so that the palms are oriented inward during the stroke. This co-occurs with the word *look* and represents the action of holding pears while inspecting them.



(646) *he'll look at them*

Following this utterance, P3 finishes by saying that the man will *put them in the basket* in line (647). She maintains the same handshape that she used in line (646), with both hands open and the fingers bent inward. Her palms are oriented downward, and she moves both hands down and to the left. This gesture co-occurs only with the word *put*.



(647) put them in the basket

At this point in the discourse, P3 does not need to elaborate the event of putting the pears in the basket. Her handshape still represents that there are objects but does not specify their shape. The movement marks the endpoint of the trajectory to the left, and out of the speaker's gesture space. This simplified trajectory adjusts the construal to reflect a perfective event.

The grasp and the motion are both capable of being schematized, but this does not necessarily mean that the schematized element is unprofiled. In lines (225) and (228), P2 schematizes the motion of the gesture while still using it to profile the event. He produces a gesture in line (225) using his right hand with the fingers closed and the palm oriented inward and toward his body. He moves his wrist in a cyclical motion twice. The stroke co-occurs with the words *picking them*, and profiles the event of the man picking the pears.

| | | | | |
|-------|----|---------|---------|---|
| (225) | P2 | 04:05.9 | 04:07.0 | and he's like <u>picking them</u> |
| (226) | | 04:07.0 | 04:08.8 | and he has like a little apron with a pouch |
| (227) | | 04:09.2 | 04:09.7 | and he go down |
| (228) | | 04:09.7 | 04:10.6 | he <u>dump them all</u> there |



(225) and he's like picking them

Both the grasp and the movement are schematized in this gesture. Instead of opening his hand wide enough to depict the size of a pear, he keeps it closed. This still encodes the information that the agent is holding an object, but does not specify any details about that object. The motion, likewise, does not represent the action of picking pears from a tree. Rather than having a twisting motion or a downward trajectory, it takes the form of a cyclic. By using this motion, P2 describes the event with low specificity, construing it as an ongoing or imperfective event.

Continuing in line (228), P2 produces a gesture with both hands closed, with the thumbs pressed against the back of the forefinger. The palms are oriented downward, with the wrists turned toward his body at the start of the gesture, then gradually turned outward by the end of the gesture. The stroke co-occurs with the word *dump*, and the hold is maintained through the phrase *them all*.



(288) he dump them all there



The handshape in this gesture represents the grasp that would be used to hold a piece of cloth, but the movement is minimized to a straight line to mark an outward trajectory. It adds little detail to the scene, other than the fact that the character moves an object away from his abdomen.

When describing the scene in which the man climbs down the ladder to put the pears in the basket, P3 produces a gesture using both hands, with the fingers closed and the palms oriented inward. Both hands are up in front of the speaker at the beginning of the stroke, and then drop down as the speaker says *coming back*. The hold is maintained through the rest of the phrase, *down from the pear tree again*.

| | | | | |
|-------|----|---------|---------|--|
| (726) | P3 | 02:30.6 | 02:31.9 | and then at this time |
| (727) | | 02:31.9 | 02:35.6 | the pear guy # is <u>coming back down from the pear tree again</u> |
| (728) | | 02:35.6 | 02:37.9 | with his # apron full of pears |



(727) the pear guy # is coming back down from the pear tree again

This gesture blends two similar concepts to construct one image. While the speaker uses the gesture to encode that the man is climbing down a ladder, she uses the downward movement to encode the meaning of *coming back down*, rather than the act of climbing down a ladder. The grasp component specifies the shape of the ladder, but the movement only encodes a downward trajectory. The movement elaborates the event by providing a structure of downward motion, leaving the manner of the event unspecified,

while the handshape indexes the ladder, providing the manner of the event through implicature.

As mentioned above, representing the event with a cyclic can adjust the scope of the event. But scalar adjustment is not always achieved through altering the trajectory. In the following example, the speaker adjusts the scope of the event through repetition, while the trajectory of the gesture serves to present the event with less specificity. While describing the final scene of the film, where the boys are eating their pears while walking by the man from whom they were stolen, P3 produces a gesture using her right hand, with the fingers closed and the palm oriented inward. The stroke begins in her neutral space and arcs up and to the right. She repeats this motion twice, co-occurring with the phrase *and they're eating pears*.

| | | | | |
|-------|----|---------|---------|---------------------------------------|
| (744) | P3 | 02:56.7 | 02:57.9 | they each get three pears |
| (745) | | 02:57.9 | 02:59.7 | and then those boys are walking back |
| (746) | | 03:00.0 | 03:01.3 | they walk by that pear guy |
| (747) | P4 | 03:01.2 | 03:01.7 | mhmm |
| (748) | P3 | 03:01.6 | 03:02.9 | <u>and they're eating their pears</u> |
| (749) | | 03:03.3 | 03:05.7 | and # i want to say that's it |



(748) and they're eating their pears

The motion she uses deviates from the trajectory one would expect to be used for eating. Rather than having an endpoint near the mouth, the trajectory ends near the shoulder. As the speaker produces the gesture twice, she uses reduplication to indicate the ongoing aspect of the event. It is possible that she uses the shoulder as an endpoint rather

than the mouth in order to prepare for the repetition of the gesture, but this isn't certain. As the grasp also remains unspecified in this gesture, the details concerning the shape of the pears are not elaborated. Although it is not certain why she uses this form in particular, it is clear that this form does not specify the act of eating pears in great detail. It encodes the event as a repetitive event, though schematic. By producing this gesture, P3 places the focus on the notion that the event was ongoing, rather than on the details of the event itself.

Chapter 5

Theoretical Applications

To summarize, the handling gesture can be used for several different functions. As prior research has shown (Masson-Carro et al 2016; Hostetter 2014; Pine et al 2010), it can be used during reference to objects that afford manual interaction. In addition, however, it is used to profile the event of interacting with an object, and is even used while referring to an agent manually interacting with an object. While there are differences in form across the various instances provided above, these differences serve other functions than selecting which component of the image schema to profile. The grasp component can be manifested through various handshapes, either depending on the shape of the object being indexed or on whether the speaker decides to represent the shape schematically. Likewise, the motion component can take several different forms.

5.1 Profile and Conceptual Base

As the handling gesture occurs in several different contexts, it is necessary to develop a schematic meaning that incorporates all of these instances. Although the form of the gesture does not have a component that encodes an agent, the emergent structure of the construction provides that it can be used to profile agents of interaction events, in addition to the objects and events themselves. The handling gesture's potential to profile all three elements involved in a manual interaction event necessitates that the conceptual base contains all three, as is shown in Figure 5.1 below.

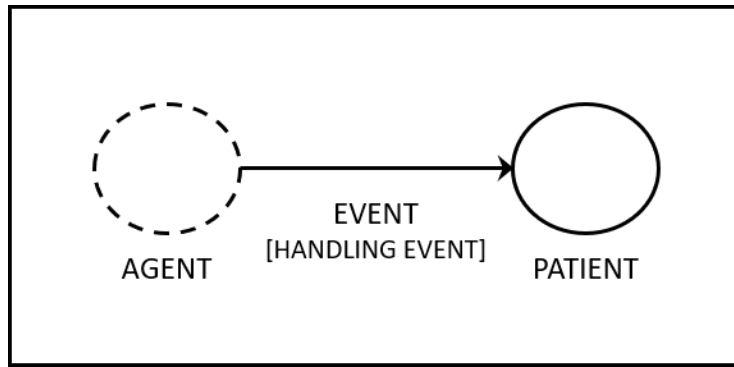


Fig. 5.1. Schematic Structure of the Handling Gesture

As Langacker (1987) writes, the profile of any utterance is conceptualized in relation to its conceptual base. For instance, the concept of a circle cannot be conceptualized without also conceptualizing its relation to the domain of space. Likewise, the concept of an arc cannot be conceptualized without also conceptualizing its relation to the domain of a circle. Figure 5.2 illustrates this relationship:

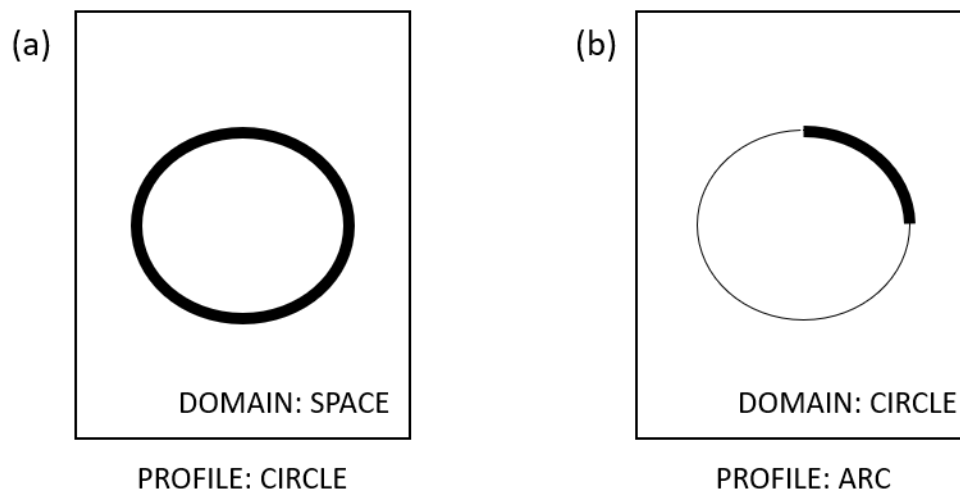


Fig. 5.2. Bases and Profiles. Adapted from Langacker (1987:184). The profile of circle resides in the domain of space, while the profile of arc resides in the domain of circle. The thick line in (b) represents the profile, while the narrow line represents its base. The profile and domain are both mutually dependent.

Importantly, Langacker (1987) points out, the conceptual base is not necessarily a visual image. Any given concept may reside in multiple cognitive domains simultaneously. When relating scenes from the *Pear Film*, for instance, the participants of this study may have been accessing both visual memory, motor imagery, and other encyclopedic knowledge associated with the concepts they were describing. Thus, the conceptual base presented in Figure 5.1 is not just an abstract image of an agent interacting with an object, but rather the sensorimotor simulation of manually interacting with an object.

Recall from chapter 2 that when people conceptualize objects that afford manual interaction, they simulate interacting with those objects (Gerlach et al 2002; Glover et al 2004; Weisberg et al 2007). Recall also that simulated action influences gesture production (Chu & Kita 2016; Cook & Tanenhaus 2009). These findings suggest that when speakers produce a handling gesture about an object that affords manual interaction, they are simulating the manual interaction depicted in the gesture. According to Langacker (1987), *things* are profiled in relation to a conceptual base, which may be any domain of experience, including a simulated motor event. Therefore, when a speaker situates an object within a manual interaction event, that object is conceptualized in relation to the event itself.

Returning to the instance in line (619) from section 4.2.2, it is evident that P3 profiles the concept of pears within the domain of picking them from a tree in order to negotiate the meaning of the word *pears*.

| | | | | |
|-------|----|---------|---------|---|
| (613) | P3 | 00:10.4 | 00:11.8 | it started off with this guy |
| (614) | | 00:11.8 | 00:13.7 | he was <u>pulling pears from</u> a tree |
| (615) | | 00:13.9 | 00:15.3 | it's a real rural area |
| (616) | | 00:15.4 | 00:16.4 | like there's nothing around |

| | | | | |
|-------|----|---------|---------|------------------------------------|
| (617) | P4 | 00:15.8 | 00:16.3 | pears |
| (618) | | 00:16.3 | 00:17.0 | like |
| (619) | P3 | 00:16.4 | 00:17.9 | pears # <u>like you know pears</u> |
| (620) | P4 | 00:17.2 | 00:18.0 | oh the fruit |
| (621) | | 00:18.0 | 00:18.4 | okay |
| (622) | P3 | 00:18.1 | 00:18.5 | yeah |
| (623) | | 00:18.7 | 00:20.0 | pulling pears down |



(619) *pears* # like you know pears

It is important to note that *pears* do not inherently reside in the domain of manual interaction events, nor in the domain of picking pears from trees. Although pears do afford manual interaction and therefore would likely elicit the sensorimotor simulation of interacting with them, it seems unlikely that the prototypical experience of interacting with pears includes picking them from trees. Because she has already accessed this domain in line (614), though, it is readily accessible as a base in which to profile *pears*. By using a handling gesture that depicts the act of picking pears from a tree, P3 construes the concept of pears as a participant of a manual interaction event. As a result, *pears* is now necessarily profiled in relation to the base, which includes an agent performing the act of picking pears from a tree. By accessing this same domain, P4 is able to understand the meaning of the word *pears*.

As will be discussed in the next section, this conceptual base integrates with the content of the verbal modality, which specifies the elements of the base further. By integrating with a referring expression that profiles an object, the schema is elaborated

such that the visual information describes the physical properties of the object; by integrating with a predicate, the manual interaction is specified as an action performed by an agent; and by integrating with a referring expression that profiles a person, the event or patient roles are elaborated as being relevant in identifying the person profiled in the expression.

5.2 Conceptual Integration

There is little in the form of the gesture itself that determines which element of the schema is to be profiled. Rather, this is accomplished through conceptual integration. The gesture provides a semantic frame elaborating a type of manual interaction. This frame—while still schematic—is a more instantiated construal of the image schema for manual interaction. It contains several elements, including the handshape used to hold the object, the trajectories involved in the motion, spatial relationships relevant to the interaction, and the agent performing the interaction. When juxtaposed with the spoken component of the utterance, it becomes further elaborated by the semantic frame of the spoken construction.

When the gesture is used to profile the semantic patient of the image schema, it does so because it co-occurs with a referring expression. In the following example, the stroke occurs with two phrases which include nominals: *and like it* and *like a little lid*. There is no mention within the utterance of an agent or an event.

The handling gesture sets up a schematic substructure. The form of the grasp shows that the shape of the object is flat, and when elaborated by the depicted action, we see that it has to do with lifting an object because of its upward trajectory. As the motion

also reveals any spatial relationships between relevant participants, it provides the information that the object is located on the agent's abdomen.

| | | | | |
|-------|----|---------|---------|---|
| (109) | P1 | 01:58.2 | 01:59.4 | and then he had like a |
| (110) | | 01:59.8 | 02:01.1 | he had this really cool apron on |
| (111) | | 02:01.4 | 02:02.3 | and uh it like |
| (112) | | 02:02.8 | 02:04.5 | it was like it was like a little kangaroo pouch |
| (113) | | 02:04.8 | 02:05.2 | and |
| (114) | | 02:05.6 | 02:06.9 | <u>and like it it had like a little lid on it</u> |
| (115) | | 02:06.9 | 02:08.1 | and he was putting all the pears in that |



(114) and like it it had like a little lid on it

The first time she produces the gesture, the stroke co-occurs with *and like it*, which refers to the apron the man is wearing. The second time, it co-occurs with *like a little lid*. When this phrase blends with the gesture, it sets up cross-space mappings between the corresponding roles in the two spaces (see Figure 5.3). In the gestural frame, the roles consist of the agent, event, and patient. The event is specified as occurring near the abdomen and having an upward trajectory, and the patient is specified as being located near the abdomen of the agent. The corresponding role within the spoken semantic frame is *lid*, which is the referent of the referring expression. As the semantic frame of *lid* profiles an inanimate object, it corresponds to the patient role in the gestural frame. When these elements project onto the blend space, the expression *little lid* elaborates the patient element of the gesture. At this point, the gesture is interpreted as referential, rather than predicative, even though the more salient aspect of the gesture is

the event. While the event element of the gesture describes how the agent interacts with the patient, when the patient is specified, it becomes clear that the same sort of manual interaction is that which one would use to interact with the *lid*.

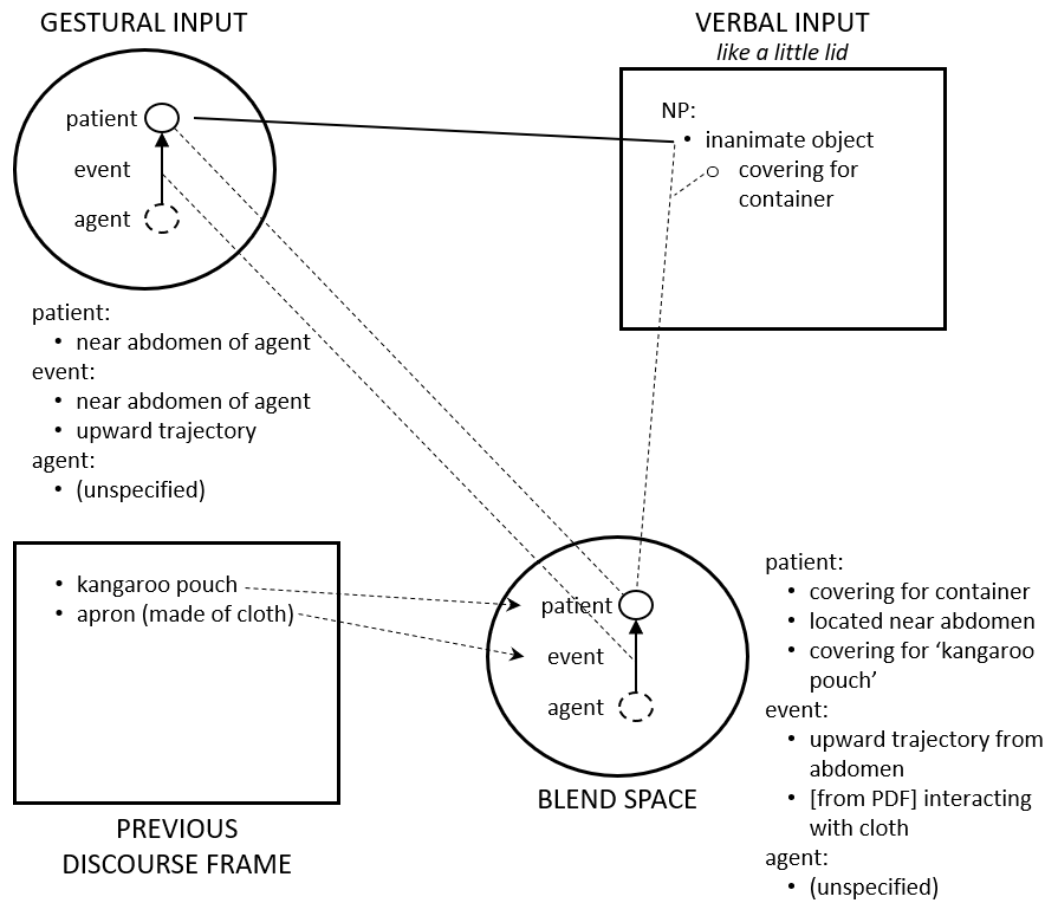


Fig. 5.3. Conceptual Integration of Line (114)

Similarly, when the handling gesture is used to reintroduce the agent of the event, it co-occurs with the nominal referring to the character. Looking again at one of the examples of reintroduction from earlier, we can see that P1's gesture depicting the action of using a paddle ball is used to profile the boy who is playing with the paddle ball. In

line (360), her gesture co-occurs with *the kid with the paddle*, and the hold lasts through the rest of the prepositional phrase.

| | | | | |
|-------|----|---------|---------|---|
| (360) | P1 | 06:20.2 | 06:22.2 | the <u>the ki:d with the paddle</u> thing |
| (361) | | 06:22.2 | 06:23.7 | he like puts it in his pocket picks it up |



(360) *the the ki:d with the paddle thing*

This gesture is fairly unique in the discourse. There are no other objects that afford the same type of action as the paddle ball, so it is used as a salient descriptor when reintroducing the boy playing with it. P1's use of the gesture in line (360) evokes the image of using this toy. The grasp component indicates that the object has a handle, and the back-and-forth repetitive movement constructs the scene of a person interacting with an unspecified object in this way. Though unspecified at this point in the utterance, this gesture should remind the addressee of the image with the boy and the paddle ball.

In the gesture's semantic frame is an object with a handle, a repetitive back-and-forth motion, and an agent using this motion to interact with the object. In the semantic frame of the spoken component is *the kid* and *the paddle* (see Figure 5.4). As both of these nominals are definite, they are marked as entities which have already been referred to in the discourse—leaving five possible referents for *the kid*, and only one for *the paddle*. These referents are elements within what Langacker (2008) terms the *previous discourse frame*. This frame includes all of the information previously mentioned in the discourse and is updated continually as the discourse progresses. Of these potential

referents, one is the boy who stole the pears, one is the girl on the bike, one is the boy with the paddle ball, and two are only specified as *short* and *chunky*, respectively.

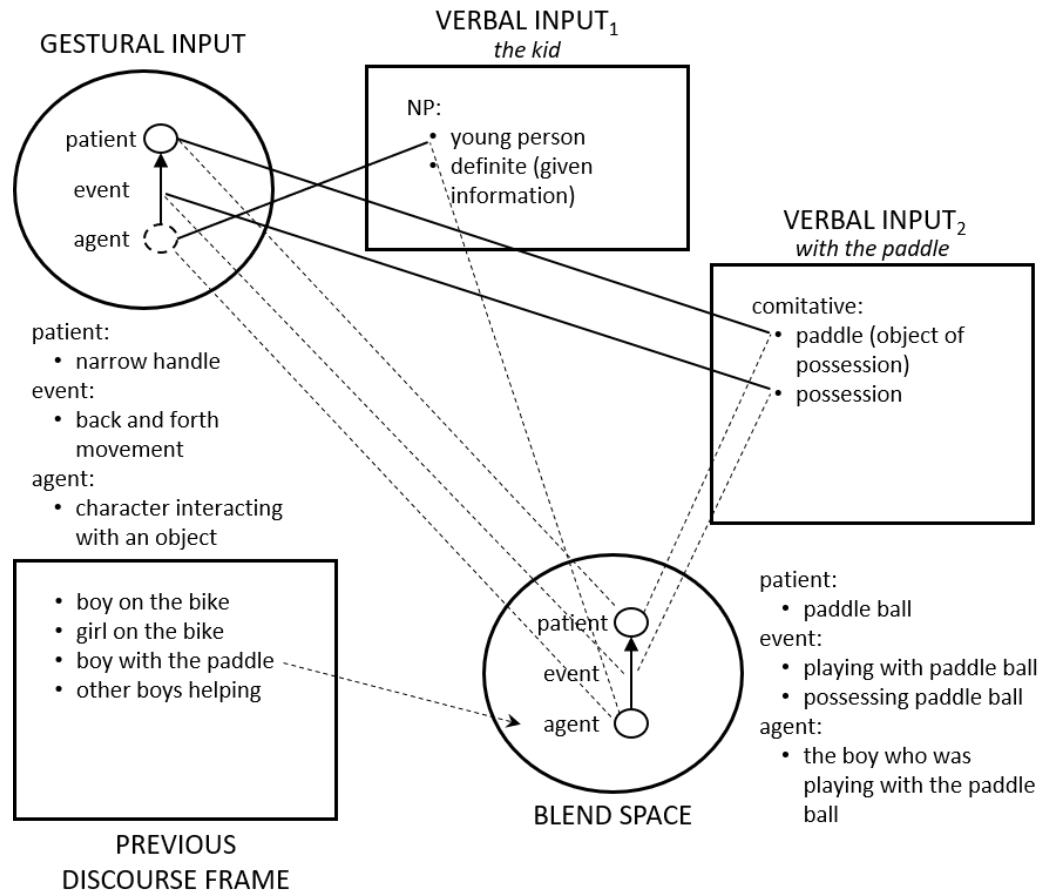


Fig. 5.4. Conceptual Integration of Line (360)

The agent role of the gestural semantic frame corresponds to *the kid* in the verbal semantic frame. At this point in the utterance, no event or patient have been expressed. The agent of the schema and *the kid* are both projected onto the blend space, as being the only corresponding elements. The back-and-forth motion and the object of the grasp are also projected onto the blend, resulting in the image of *the kid*, still unspecified, manipulating an object with a handle in a back-and-forth motion. Of the possible

referents from the previous discourse frame, the boy with the paddle ball is the only element that corresponds with the image of a kid performing this action. This referent is then projected onto the blend.

As the speaker finishes the utterance, the phrase *with the paddle thing* then arises as a new input space. The patient role of the image schema corresponds with *the paddle*, and the event role—which profiles a relationship—corresponds to the comitative relationship profiled by *with*. These two correspondences are then projected on the blend to further specify that the referent is the boy who was playing with the paddle earlier in the discourse.

When the handling gesture profiles an event, it co-occurs with a construction that encodes a relationship (including adverbials, as will be shown in the next section). As with the previous examples, the integration of the gesture and the speech provide for a much more elaborate scene than just the event by itself. In line (631), P3 describes an event in the beginning of the film in which a man passes by the pear tree leading a goat on a leash. She produces a gesture using her left hand, with the fingers closed and the palm oriented upward. She begins the stroke with her arm extended to her left, and then pulls her hand closer to her body. This stroke co-aligns with the phrase *man comes by with a*, and the hold lasts until she finishes the phrase with *a goat*.

| | | | | |
|-------|----|---------|---------|--|
| (631) | P3 | 00:28.8 | 00:34.4 | and then some # <u>man comes by with a # a</u> |
| (632) | | 00:34.4 | 00:36.3 | <u>goat</u> and it has a # a bell around his neck |



(631) and then some # man comes by with a # a goat

Her use of the closed handshape indicates that the object has a thin shape, and the upward palm orientation together with the trajectory elaborate the event as an event of pulling an object. The spatial relationships marked by the gesture indicate that the object is some distance from the agent, and that the agent is bringing the object closer to themselves. The predicate, however, does not encode an event of pulling, but rather one of motion.

In the gestural semantic frame, the patient is specified as a narrow object, and the event is specified as having a pulling nature, as shown in Figure 5.5. In the verbal frame before the dysfluency, the predicate *comes by* encodes a type of motion, and *with a* encodes a comitative relationship. The agent corresponds with *man* in the verbal frame, and the pulling event corresponds with the comitative relationship profiled by *with*. The gestural image schema, comitative relationship, and motion event are all projected onto the blend. The pulling event and comitative relationship are both blended into one event, but the object of this event is still not specified.

When the speaker finishes the utterance with *a goat*, the referent corresponds to the object roles of both the comitative event in the first verbal frame and the pulling event in the gestural frame. The goat is then projected onto the blend, providing the image that the man is engaged in a motion event, and that the goat is moving with him. Notice,

however, that the narrow object specified by the handshape of the gesture is not compatible with the goat supplied by the verbal frame. As Fauconnier and Turner (1998) write, the *completion* phase of conceptual integration provides for other world knowledge to be projected onto the blend. Included in this knowledge is the fact that animals are often led by leashes. Once this information is projected onto the blend, it elaborates the object role of the pulling relationship as a leash by which the man is pulling the goat.

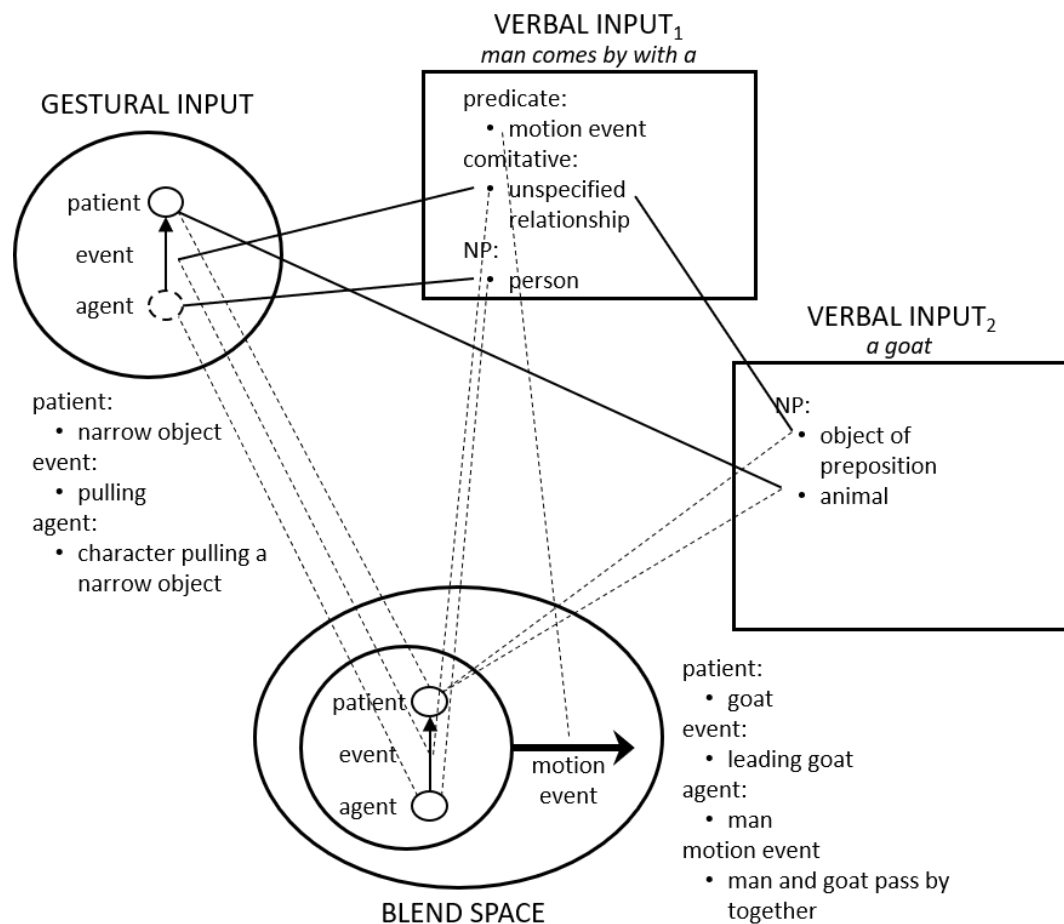


Fig. 5.5. Conceptual Integration of Line (631)

Later in the discourse, P3 uses a similar juxtaposition of speech and gesture, after P4 asks here about *the guy with the goat*. She describes the scene again, explaining that the character does not play a significant role in the film. She produces a gesture using both hands, with fingers closed and palms oriented downward. As the stroke begins in line (751) she positions both hands to her left, then moves them across to her right, over her shoulder. This stroke co-occurs with *he just walks by*. She holds the gesture through the phrase *didn't say anything*, and then produces a similar gesture with less pronounced movement with the phrase *pulled the goat* in line (753). For this gesture, she uses both hands again, with both palms oriented inward and slightly downward. When the stroke begins she positions both hands in front of her right shoulder, and then moves them farther up and to the right. Both gestures construct a scene of a person pulling on a leash.

| | | | | |
|-------|----|---------|---------|---|
| (750) | P4 | 03:05.5 | 03:06.9 | what happened with the guy with the goat |
| (751) | P3 | 03:07.0 | 03:08.1 | <u>he just walks by</u> |
| (752) | | 03:08.7 | 03:09.8 | <u>didn't say anything</u> |
| (753) | | 03:09.8 | 03:10.5 | <u>pulled the goat</u> |
| (754) | | 03:10.5 | 03:12.7 | had the goat had a # rope around its neck |



(751) he just walks by



(753) pulled the goat



Both gestures encode a referent thin enough to hold with a closed handshape. By using both hands, P3 indicates that the event requires some amount of force from the agent. In the first gesture, in line (751), the trajectory of the gesture encodes movement, a pulling event, and a sense of crossing something. The trajectory of the gesture in line (753) encodes a pulling event again.

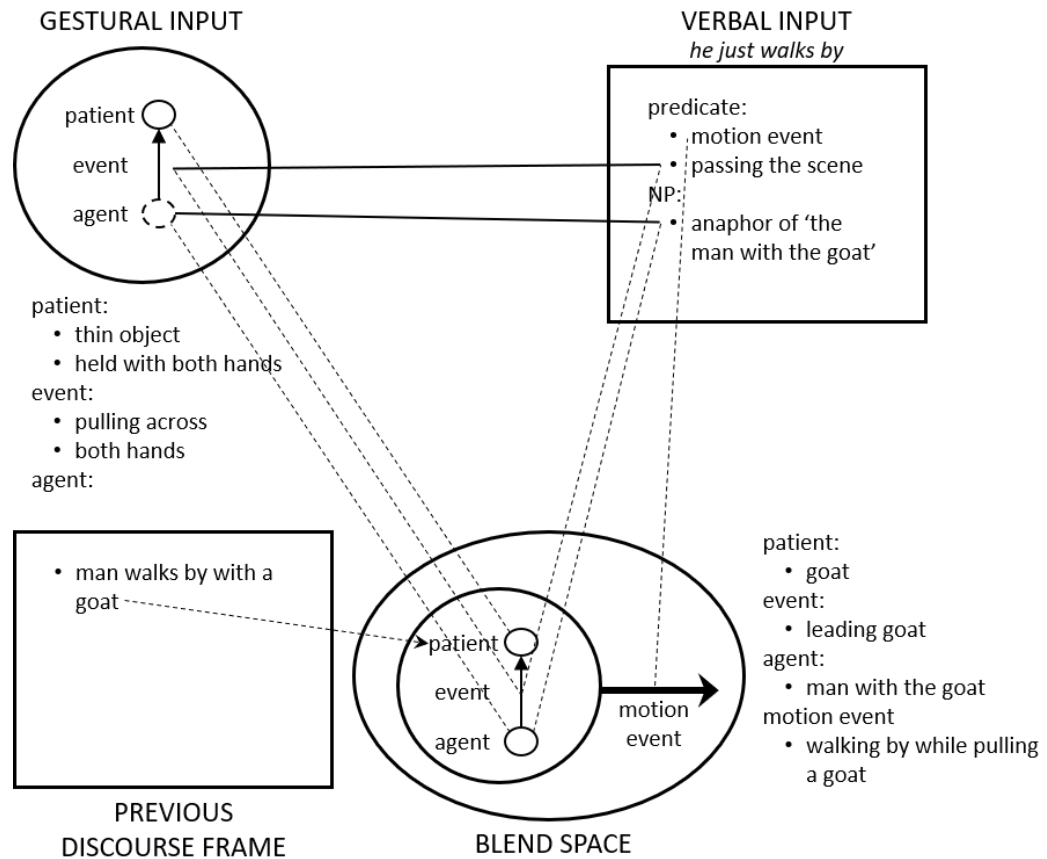


Fig. 5.6. Conceptual Integration of Line (751)

As Figure 5.6 shows, in the semantic frame of the gesture is an event that involves a person pulling a thin object across something, using both hands. The spoken semantic frame includes *the guy with the goat*, which is indexed by *he*, and a motion event that involves passing the scene. The previous discourse frame includes the fact that the man

walks by with the goat, with the implication that he did so by leading it on a leash. The agent role of the gestural frame corresponds to *the guy*, which antecedes *he*, and the pulling event in the gestural frame corresponds to the predicate of the verbal frame, *walks by*. As the motion component also encodes a trajectory from far left to far right, a linear trajectory that crosses the scene corresponds to the verb particle *by*. These three correspondences are projected onto the blend, along with the object role of the gestural frame, even though it does not have a corresponding role in the verbal frame.

Similarly to the instance in line (631) above, the presence of the goat is projected onto the blend from the discourse frame in line (751), and the knowledge that animals tend to be led by leashes is projected onto the blend. As the scene is elaborated, the walking event and the pulling event are simulated as a single event, incorporating the roles of both the man and the goat, and the scenes of pulling the goat, walking by, and passing the scene.

Two utterances later, P3 continues to elaborate on the scene in line (753) by producing a shortened version of the gesture she used previously and saying that the man *pulled the goat*. In the grasp component she encodes an object with a narrow shape that is flexible and can be grasped with two hands. In the motion component, she encodes another right-ward trajectory that indicates a pulling event.

As shown in Figure 5.7, the pulling event in the gestural frame corresponds to the predicate *pulled*, and the object role of the gestural frame corresponds to *the goat*, which is the object of the predicate. There is no reference to a leash or rope in the spoken component of the utterance, but the knowledge that objects can be pulled by a rope is supplied by the semantic frame of *pull*. This element corresponds with the object role of

the gestural frame. The corresponding pulling events are projected onto the blend as one element, the object role of the gesture frame and the rope element of the *pull* frame are projected onto the blend as one element. The *goat* element in the verbal frame and the agent role of the gestural frame are also selected for projection onto the blend. The scene constructed in line (751) is also projected from the previous discourse frame, allowing the blend to be interpreted as an elaboration of the prior scene. Finally, in line (754), P3 refers to the rope verbally and fully elaborates the relationship between the man, the rope, and the goat.

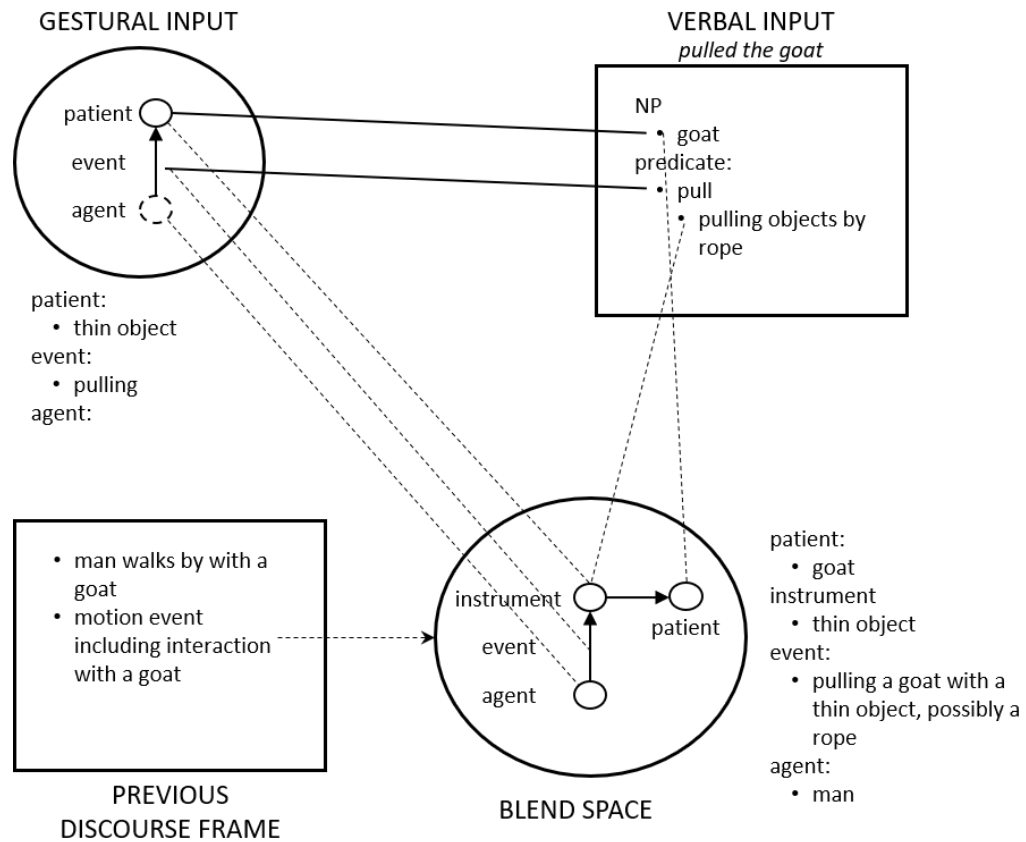


Fig. 5.7. Conceptual Integration of Line (753)

5.3 Blending with Other Gestural Constructions

Blending does not only occur between gesture and speech, but within the gestural input as well. As the grasp component of the handling construction is autonomous, it may be instantiated in other gestural constructions. While the motion component of the handling gesture specifies the nature of the manual interaction, the motion components of other gestural constructions do not. The motion component of beat gestures, for instance, marks emphasis (Ruth-Hirrel & Wilcox 2018), and the motion component of pointing gestures directs attention toward an object or space.² As an autonomous component, the grasp component can blend with these other types of movement. Since elaborating the manual interaction is the role of the depicted action, the event is not profiled when it is omitted—although the agent and event are still evoked schematically in the semantic frame. When initially setting up the scene for her narrative, P3 produces a variety of gestures to describe the baskets and to differentiate the two full baskets from the unfilled one.

| | | | | |
|-------|----|---------|---------|---|
| (636) | P3 | 00:39.0 | 00:42.9 | and there's three # wooden # um # <u>like</u> |
| | | | | <u>baskets</u> |
| (637) | | 00:42.9 | 00:44.1 | <u>wo- woven baskets</u> |
| (638) | P4 | 00:44.1 | 00:44.6 | okay |
| (639) | P3 | 00:44.7 | 00:45.3 | <u>filled</u> |
| (640) | | 00:45.3 | 00:46.5 | two of them are filled with pears |
| (641) | | 00:46.5 | 00:47.8 | <u>one of them's # being filled</u> |
| (642) | P4 | 00:47.8 | 00:48.1 | okay |

Although this analysis only focuses on the use of handling gestures, there are three other types of gestures in this example from discourse which are relevant to the

² Although Wilcox & Occhino (2016) attribute this meaning to the handshape, Kendon (2004) and Kendon & Versante (2003) attribute variations in handshape to other discourse functions, while writing that the main commonality between all instances of the pointing construction is the movement of an articulator toward an object or space.

overall analysis. The first, which occurs in line (636) with *and there's three # wooden # um #*, is an instance of what Kendon (2004) refers to as a *modelling gesture*. Unlike acting gestures, which depict entities and events through manual action, modelling gestures depict objects and events by symbolically standing in for them. In other words, with acting gestures, the hands are still interpreted as hands; but with representing gestures, the hands are interpreted as objects (Müller 2014).



(636) *and there's three # wooden # um # like baskets*

The second type, which blends with the handling gestures in lines (636) and (639), is considered a beat gesture. Beat gestures, according to Ruth-Hirrel and Wilcox (2018), are expressed through the manner of movement. This manner of movement is structurally dependent on a *carrier*, which in this case is a grasp handshape depicting a basket. Their function is to add prominence to the other linguistic elements they co-occur with.



(639) *filled*

The third non-acting gesture occurs in line (640), when P3 points to the space slightly to the left of the gesture she produces in (639). This is an instance of what McNeill (2005) refers to as *abstract pointing*, in which a speaker sets up a metaphorical relationship between space and an abstract idea. In this case, the abstract idea is the baskets, which P3 indexes in this space in line (636). According to Wilcox and Occhino (2016), the pointing construction uses assigned space as a reference point from which the addressee can conceptually access the referent. That is, by pointing to a space, the speaker establishes it as an anaphor through which they may refer to a referent associated with it.



(640) *two of them are filled with pears*

P3 produces three instances of handling gestures in this example from discourse, the first of which occurs in lines (636) through (637). She begins the utterance with the modelling gestures, producing a large circle by touching her hands together and extending her elbows outward to produce a large circle with her arms. Her arms and hands in this gesture are used to depict the top rim of the baskets. She establishes three spaces in front of her, by producing three downbeats from left to right, illustrating that there are three baskets. With the phrase *like baskets*, she produces a handling gesture

using both hands, with the fingers closed and the thumbs pressed against the backs of the forefingers. The palms have an inward wrist orientation, and the knuckles face down. She elaborates the motion component by shaking her hands lightly up and down. The hold of this gesture lasts through the phrase *woven baskets* in line (637).



(636) *and there's three # wooden # um # like baskets*
(637) *wo- woven baskets*

The modelling and handling gestures together set up the schematic substructure which is elaborated by the phrase *there's three # wooden # um # like baskets*. First, the representing gesture establishes the schematic scene that there are three large round objects. The rightward movement together with three downbeats provides the information that there are three objects being referred to. The circular shape of the speaker's arms further elaborates this information by encoding that the three objects are large and circular in shape. When the first part of the utterance elaborates this information, we see that the three large, round objects she sets up in front of her are made of wood.

Next, she elaborates this information further by producing a handling gesture while saying *like baskets*. The handshape of this gesture encodes that the objects being referred to are held with both hands, and that the grip used to hold them requires two closed fists. By producing a beat in tandem with this gesture, the speaker encodes that this information is highly relevant for the utterance.

In the semantic frame of the gesture, shown in Figure 5.8, the object role of the schema is elaborated as an object that requires two hands to hold, and likely has handles. The manual interaction event and the agent, however, are not specified. Rather, the motion component is specified as a beat, which serves to make its co-occurring information in the spoken modality more prominent. The semantic frame of the spoken input contains the concept of baskets, and other encyclopedic information about them. This includes that baskets tend to be round, often have handles, and are containers that one might use in which to keep fruit. The previous discourse frame includes the information that the man is picking pears from a tree, and that there are three large, round, wooden, unspecified objects.

The object element of the gestural frame corresponds to the entity profiled by *baskets* in the verbal frame, while the information that the grasp involves a narrow shape corresponds to the knowledge that baskets tend to have handles. The information that the object requires two hands to hold corresponds to the knowledge that baskets may be large or heavy. As the function of the beat gesture is to add emphasis to the co-temporal content of the spoken phrase, the emphatic role of the beat corresponds to the referent of *baskets*. These corresponding elements are projected onto the blend, while the event and agent roles are not selected for projection.

The schematic substructure presented by the gesture adds to the prior structure, by specifying the objects P3 has been modifying. Not only are they large, round, made of wood, and three in number, but they are also manipulable objects. This manual interaction requires both hands, and, as the beat informs us, this interaction and the co-occurring speech are the more salient aspects of this entity. The speech specifies these

objects as baskets. The fact that the grasp encodes two handles depends on the semantic content of the referent. When this referent is specified as *baskets*, it becomes clear that the baskets have two handles. The emphatic role of the beat prepares the hearer to tune into this information so that the concept of baskets with two handles is highly prominent. She then further specifies these baskets by stating that they are *woven*.

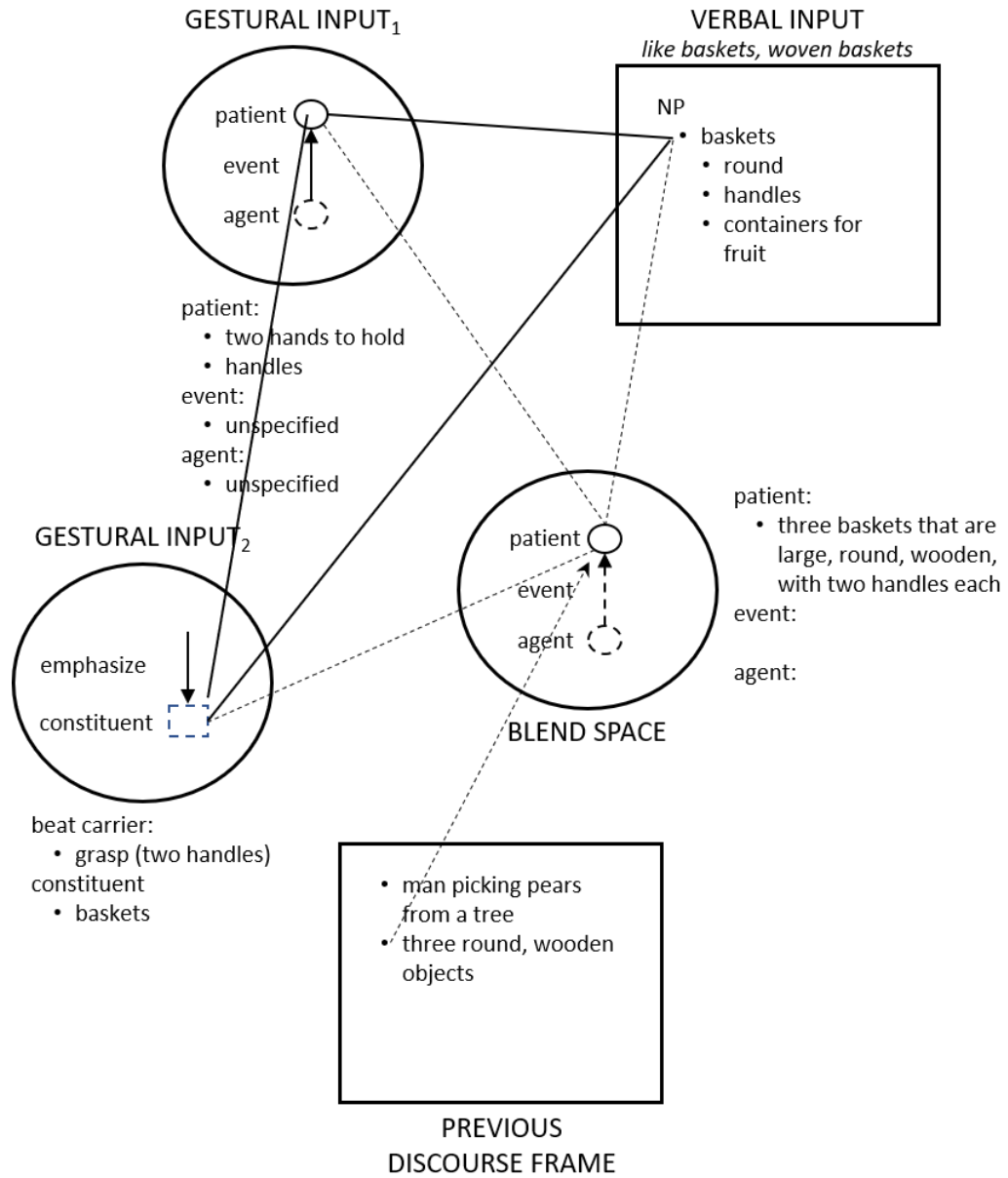


Fig. 5.8. Conceptual Integration of Lines (636) and (637)

Once her addressee acknowledges that she understands what the referent is, P3 continues to modify it, stating that the baskets are *filled*. She maintains the same handshape from the hold of the previous gesture and produces another beat.



(639) *filled*

By producing another beat over the hold from the previous gesture, the speaker maintains the referent from the previous utterance in the discourse. It sets up the substructure that more is still to be said about the baskets and emphasizes this with a beat. The participle elaborates the baskets further by specifying that they are filled.

As the gesture is still held from the previous utterance in (636), the referent of (636) is part of its semantic frame, as the object role of the grasp construction. As the verbal component has only a modifier, the semantic frame also contains a schematic role for an entity that it modifies. This entity corresponds with the referent indexed in the gesture, giving the blend that the baskets are filled, as can be seen in Figure 5.9.

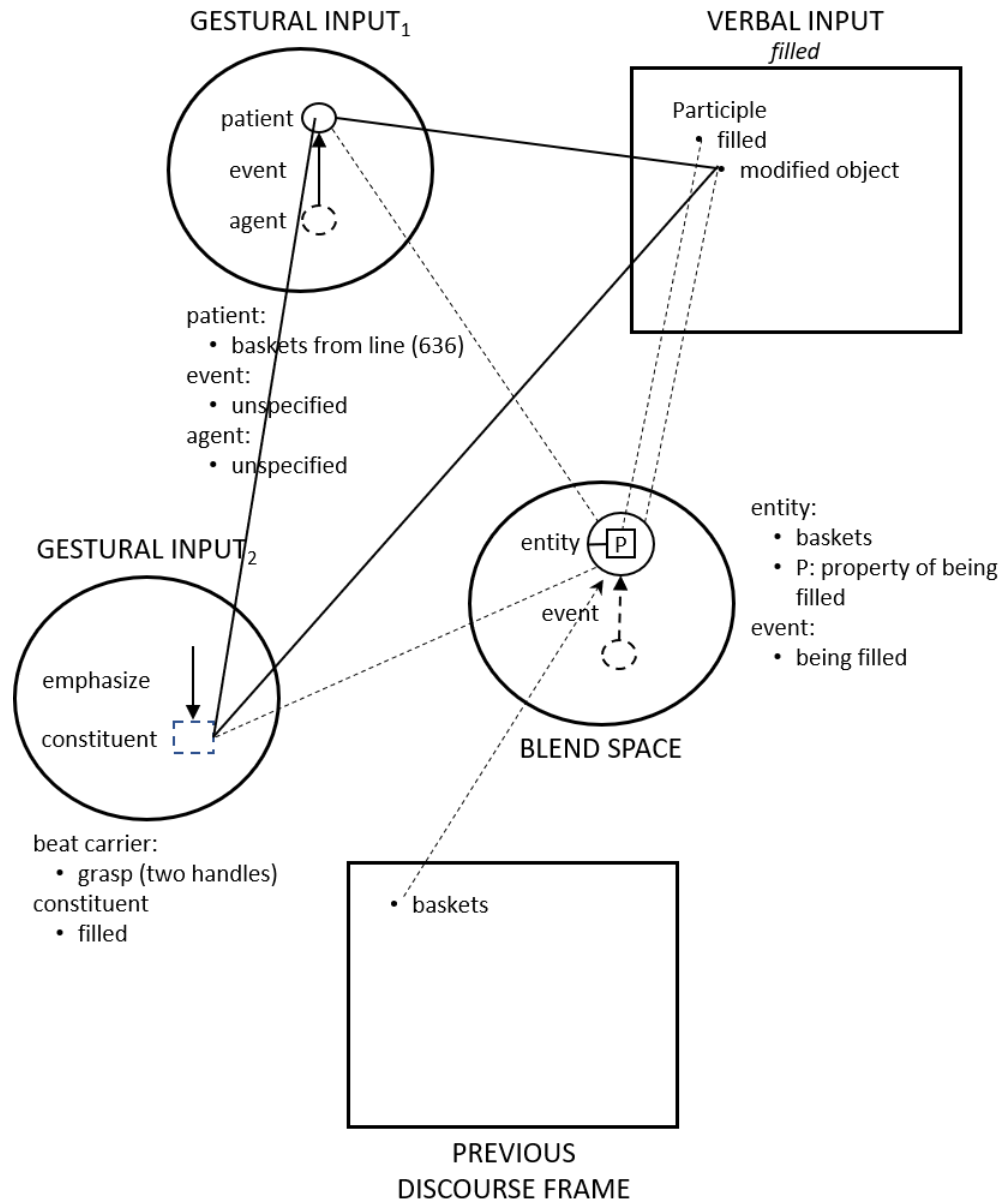


Fig. 5.9. Conceptual Integration of Line (639)

At this point, P3 clarifies further by distinguishing between two of the baskets which are full of pears, and a third basket which is in the process of being filled. To do this, she points to the left in line (640) while saying *two of them are filled with pears*. She then produces another gesture to her right in line (641), by blending a grasp handshape

with a beat gesture while saying *one of them's # being filled*. She uses both hands for this gesture, with the fingers spread and slightly bent. Both palms have an inward palm orientation. Where the grasp in the earlier gesture depicts holding the baskets by their handles, the grasp of this gesture depicts holding the basket by its sides. The stroke of the beat occurs during the words *one* and *being*.



(640) *two of them are filled with pears*



(641) *one of them's # being filled*

Her use of space sets up the substructure of comparison and distinction. By establishing the two full baskets in the space to her left in line (640) and producing the handling gesture in another space to the right in line (641), she marks that the referent of the current utterance is distinct from the referent in the previous utterance. The beat that blends with the gesture adds emphasis to the spatial distinction and to the two words *one* and *being*. By adding emphasis to the word *one*, she prepares her addressee for the information that this basket is qualitatively different from the other two. It is not one of the two that she just referenced, but a third one. By emphasizing the word *being*, she clarifies that this distinction has to do with where the baskets are in the process of being filled. For the first two baskets, this process is completed; for the third basket it is ongoing. The grasp component takes a different form than the other grasps used to refer to the basket earlier in this segment of discourse. In the grasp used in line (641), the

speaker profiles the sides of the basket, rather than its handles. By profiling the sides, she emphasizes that the basket is a container, undergoing the process of being filled.

The gestural input is itself a blend of three other constructions, as shown in Figure 5.10. The grasp component specifies an object that affords manual interaction, the beat component encodes emphasis, and the deictic component marks distinction between referents. When these three constructions are blended with the verbal input, they correspond to the singularity encoded by the numeral, and with the ongoing aspect of the progressive. While the manual interaction event and agent are unspecified in the semantic frame of the grasp, the object role corresponds to the referent of *one*. The co-occurring word slot in the semantic frame of the beat gesture also corresponds with the referent of *one*. From the semantic frame of the deictic gesture, the concept of distinction corresponds with the notion that the referent of *one* is being selected from a group of several entities. When these correspondences are projected onto the blend, the scene is specified as a singular object that affords manual interaction, that is distinct from a group of other objects. The previous discourse frame specifies that the group of objects are the two baskets previously referenced as being filled with pears. Here P3 has prepared her addressee that she is going to predicate something about this basket, and that the forthcoming information will elaborate on its distinction from the other baskets.

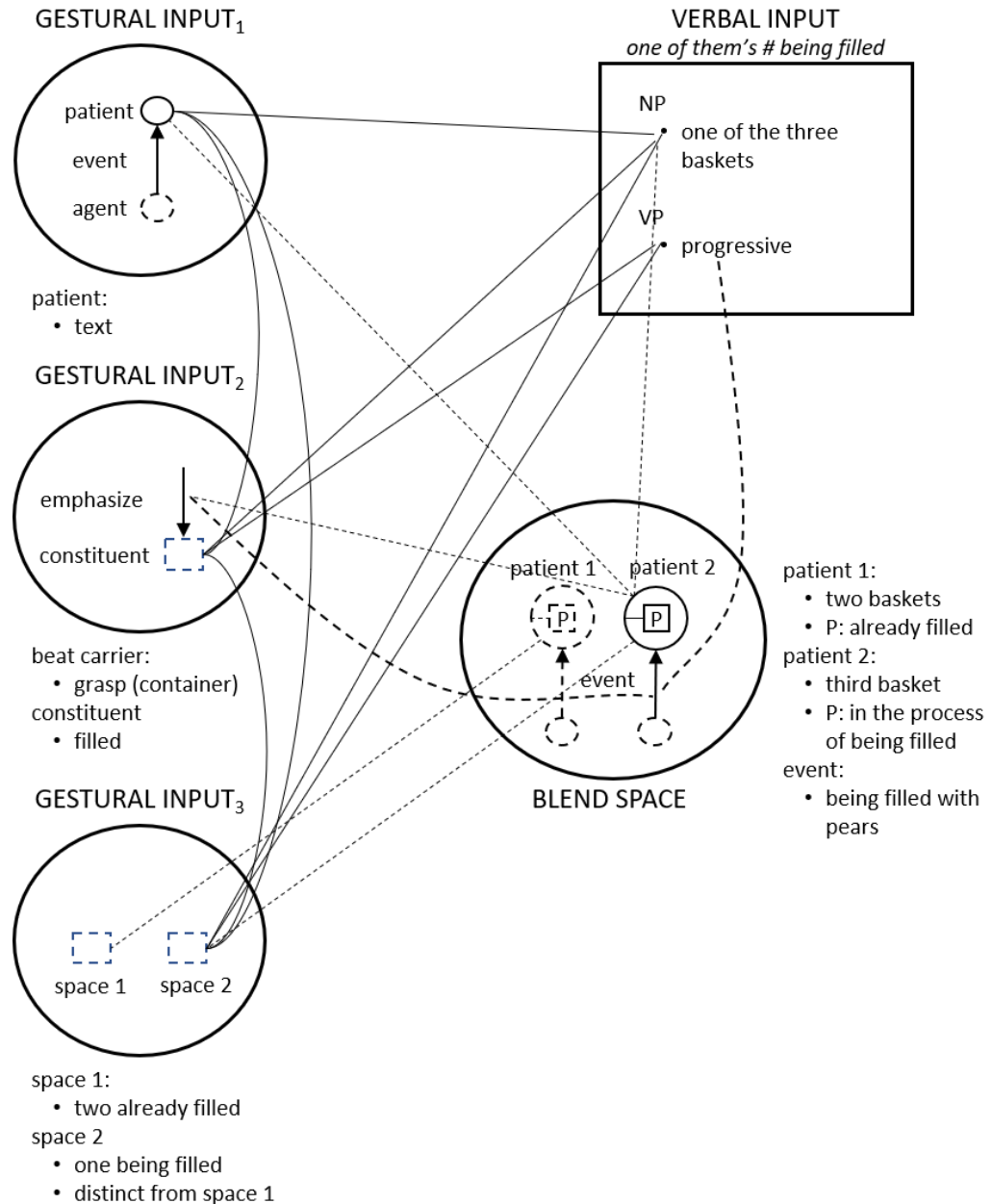


Fig. 5.10. Conceptual Integration of Line (641)

When she repeats the stroke of the beat, the emphasis slot in the semantic frame of the beat gesture corresponds to the temporal profile of the complex relationship which is profiled by *being filled*. The concept of distinction from the deictic frame also corresponds with the temporal profile of the relationship. In the semantic frame of the

grasp component, the agent and event roles remain unspecified, and the object role corresponds with the patient role in the complex relationship. This patient role also corresponds with the referent of *one of them*, as the predicate's grammatical subject. When these correspondences are projected onto the blend, the maintenance of space and gestural form maintain the referent in the discourse. The distinct property of the third basket is elaborated as the participant in the ongoing process of *being filled*.

5.4 Speech Elaborates the Gesture

It is important at this point to note the nature of the elaboration between the two component structures. While it may often look like gestures are used to illustrate what the speaker is saying, the autonomy/dependency alignment between gesture and speech suggests that it is the speech that elaborates the schematic structure provided by the gesture.

Although the verbal component of an utterance may frequently rely on the gesture to specify some of the content, gestures depend much more heavily on speech. Without hearing the speech, an observer can notice the gestures in a conversation and get an abstract idea of what the interlocutors may be talking about. But the gestures are still highly schematic without any verbal elaboration. Speech, on the other hand, does not necessarily need gesture in order to be understood.

In the same way that a preposition establishes a schematic substructure which is elaborated by the noun, gestures—and handling gestures particularly—establish a schematic substructure which is elaborated by the spoken component. This schematic substructure has elaboration sites which are specified by the co-occurring speech. In the

conceptual integration process these elaboration sites serve as roles which form cross-space mappings with their counterpart roles in the verbal semantic frame.

To illustrate, observe the interaction between the gesture and speech P1 produces in line (050). She uses her right hand, with the palm oriented upward and the fingers spread and curled in slightly. The movement forms a trajectory outward from the speaker, toward her addressee, with the stroke co-occurring with *in return*, and the hold lasting through the rest of the utterance.

| | | | | |
|-------|----|---------|---------|--|
| (045) | P1 | 00:52.8 | 00:53.4 | and then like |
| (046) | | 00:53.4 | 00:54.6 | when he fell his hat fell off |
| (047) | | 00:54.6 | 00:55.7 | but he started leaving without it |
| (048) | | 00:55.7 | 00:56.7 | and so like one of the kids saw it |
| (049) | | 00:56.7 | 00:57.6 | and gave him his hat back |
| (050) | | 00:57.6 | 00:59.0 | so <u>in return he gave him a pear</u> |



(050) so in return he gave him a pear

It is significant that the stroke of the gesture co-occurs with *in return*, rather than with *gave him a pear*. By blending the gesture with the adverbial, P1 constructs a scene specifying that there is a two-way exchange in the narrative. Had she paired the gesture with *gave him a pear*, the blend would have had no more function than to illustrate an act of giving. Instead, she marks the giving event specifically as being part of an exchange of favors.

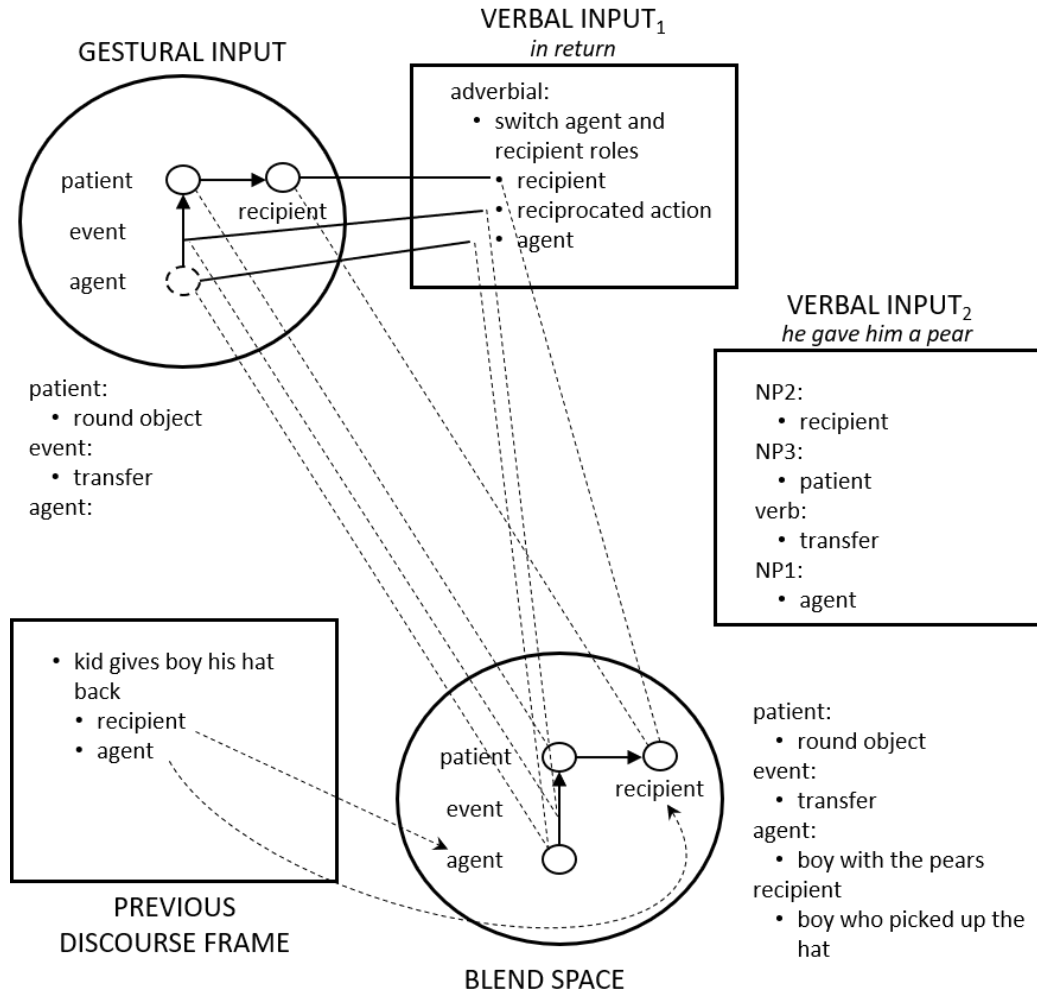


Fig. 5.11. Conceptual Integration of Line (050): *in return*

At this point in the utterance, the speaker has not specified what the agent and object of the schema are. She does, however, start creating an elaborate substructure. As shown in Figure 5.11, in the semantic frame of the gesture, the grasp component indexes a round object, the palm orientation indexes an offering event, the trajectory indexes an event of transfer, and the deictic properties of the trajectory's endpoints mark an agent and recipient. The semantic frame of *in return* includes an event of reciprocated action, which signals a switch in the agent and patient/recipient roles. The participant roles are

indexed schematically. The transfer event in the gestural frame corresponds to the reciprocated action in the verbal frame, and the agent and recipient roles in the gestural frame correspond to the new agent and recipient roles indexed in the participant switch in the verbal frame. The event correspondences, agent correspondences, and recipient correspondences are all projected onto the blend, as well as the patient role of the gestural frame, which does not correspond to any elements in the verbal frame.

The previous discourse frame contains the previously predicated event, along with its agent, patient, and recipient roles. The agent in this frame, the kid who picks up the hat, corresponds to the recipient role in the blend, while the recipient role in the previous discourse frame, the owner of the hat, corresponds to the agent role in the blend. The image is then elaborated to signify that after having received his hat, the boy proceeds to give a schematic object to the kid who gave it to him.

The structure of this blend is governed by the gesture. The elements provided by the semantic frame of the gesture construct the schematic substructure of the event, while the semantic frame of the speech elaborates the participant roles of the event. This blend provides a more specified structure—though still schematic—for the rest of the utterance, when the speaker says *he gave him a pear*. Through frame blending again, this clause further elaborates the substructure set up by the gesture.

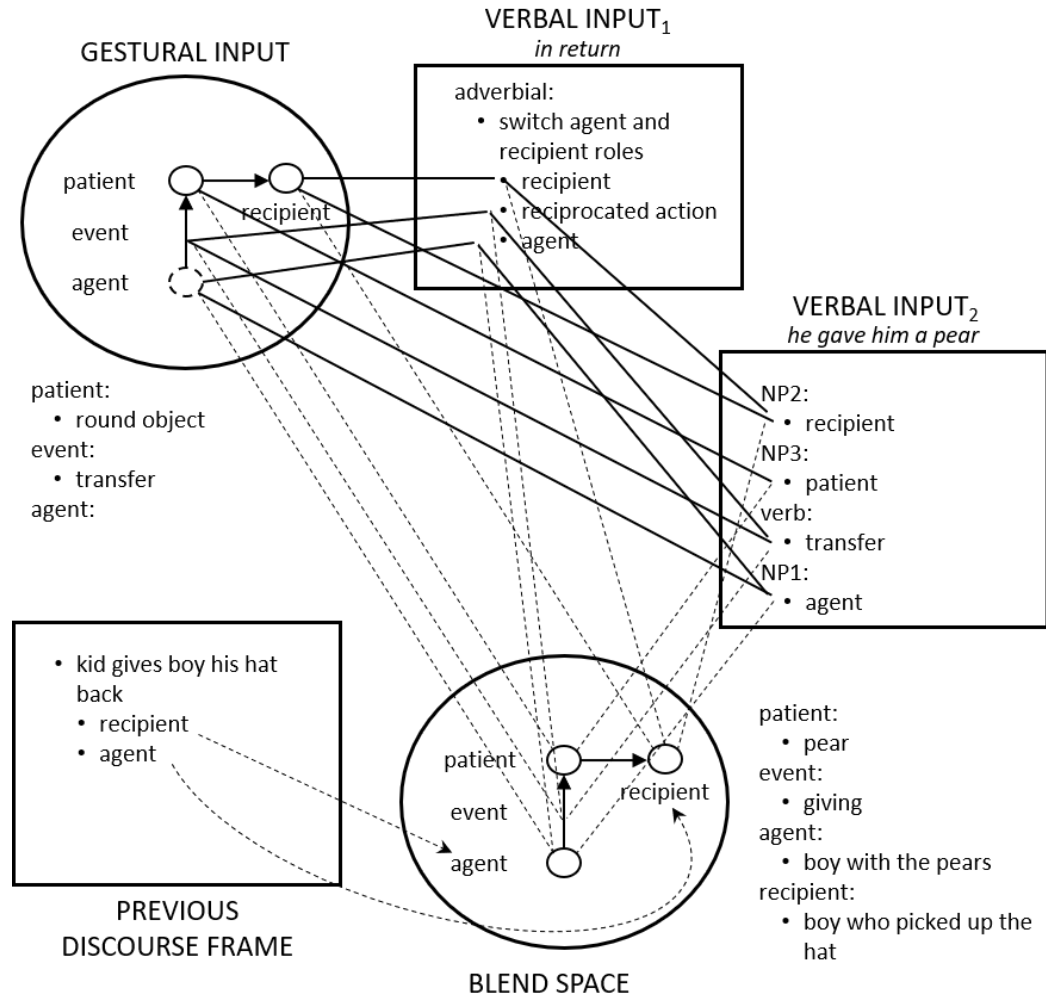


Fig. 5.12. Conceptual Integration of Line (050): *he gave him a pear*

The rest of the utterance updates the blend by integrating with the semantic frames of the adverbial and gesture, as shown in Figure 5.12. The hold of the gesture allows the substructure to remain live while the new input frame elaborates it with new information. The semantic frame of *he gave him a pear* includes a transfer event, an agent role, a patient role, and a recipient role. The agent and recipient roles in the semantic frame of the clause correspond respectively to the agent and recipient roles in the semantic frames of the adverbial and gesture. The transfer event in the clausal frame

corresponds to the transfer event in the gestural frame and the reciprocated action in the adverbial frame. When these elements project onto the blend, they further elaborate the schematic substructure established by the gesture. The transfer event is specified as an act of giving, and the patient role is specified as being a pear. The pronouns further specify the participants as the people indexed in the previous discourse. The previous discourse frame allows for the scene to be elaborated more fully, with the pears indexing the contents of the boy's basket which the other kids have helped him pick up off of the ground.

5.5 Conclusion

This analysis makes three claims about the handling gesture. First, the handling gesture situates its profile—whether the patient, agent, or event connecting the two—within the context of a manual interaction event. The element that is profiled within this event is conceptualized according to its relation to the event. Second, the conceptual base provided by the gesture integrates with the speech to yield the intended communicative signal. By applying Fauconnier and Turner's (1998) conceptual integration theory, this analysis shows that both input frames supply unique information to the blend, and that the integration between gesture and speech selects which element is profiled. Third, the gestural modality supplies the schematic structure of the utterance, which is elaborated by the speech. By activating the cognitive domain of the manual interaction event, the speaker profiles the corresponding elements in the speech in relation to a manual interaction with an object.

Chapter 6

Conclusion

This study has shown that the handling gesture is used to profile three different elements of a manual interaction event. It prototypically profiles the process itself, but it can also profile the object that affords manual interaction and, in contexts of reintroduction, the agent performing the action. While there is formal variation in the gesture, this variation does not correspond to which element is profiled, but rather to the physical properties of the elements profiled and to the granularity of the construal.

The elements profiled by the handling gesture are construed according to their relation to the conceptual base, which is the simulation of a manual interaction event. Although their participation in a manual interaction event is not an inherent property of physical objects, speakers choose to situate objects within these events in order to reach their communicative goals. When an object is construed in relation to an event, its conception is dependent on its role within that event.

The conceptual base that is evoked by the handling gesture blends with the spoken content of the utterance to produce an elaborate image. Elements within the semantic frame of the gesture that correspond to elements within the semantic frame of the speech establish the generic structure from which the blend derives. Other elements from each space are projected onto the blend space, which is further elaborated by the discourse context and external knowledge. By applying conceptual integration theory, this study has shown that both the spoken content and the gestural content supply unique information to the blend.

As Langacker (2008) writes that semantically dependent component structures of a construction establish the schematic substructure which is elaborated by the more autonomous component structure, this study has shown that the gestural component of an utterance establishes the schematic substructure which is elaborated by the verbal component. This schematic substructure is the cognitive base in relation to which the profile of the utterance is conceptualized. By providing this substructure, the handling gesture allows for the utterance to be situated within a manual interaction event, which the addressee can access through sensorimotor simulation.

This analysis has focused solely on handling gestures used to profile manual interactions with physical objects. As it stands, the current definition of the handling gesture is dependent on instances with concrete reference. Further research should investigate metaphorical uses of the handling gesture and refine the definition of the gesture to allow metaphorical instances.

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