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Strict vs. Flexible Accomplishment Predicates

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Strict vs. Flexible Accomplishment Predicates

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Dedication

To my parents.

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Strict vs. Flexible Accomplishment Predicates

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The central issue of this study is how predicates in English and ASL represent the completeness of events. The standard view is that predicates which are composed of dynamic verbs with quantized arguments denote the reaching of a natural endpoint (Vendler (1957), Dowty (1979), Smith (1991), Verkuyl (1993), Krifka (1998)). A consequence of this view is that sentences with dynamic verbs and quantized arguments are false when they refer to non-completed events. For example, if John ate only half of a sandwich, the sentence *John ate a sandwich is* false as it applies to this event.

Some researchers have questioned whether this standard view matches native speaker intuitions (Lin (2004), Smollett (2005)). It is my hypothesis that the lexical aspectual category of accomplishments (those which have an obligatory preparatory phase and a natural endpoint) can be subdivided into strict accomplishments, those that require event completion (endpoint inclusion) in their truth conditions and flexible accomplishments, those which do not. This study addresses the following questions. (1) Do dynamic verb/quantized argument predicates entail endpoint inclusion? (2) Is there an inference, as opposed to an entailment, of endpoint-inclusion in English and ASL? If so what is the nature of this inference? (3) Is there a conceptual property that underlies the membership of predicates in the hypothesized class of flexible accomplishments?

Three experiments were conducted in the course of this study to address these questions. The data gathered were analyzed in the light of the standard aspectuality literature. The following conclusions were reached: (1) The endpoint-inclusion inference in English is a conversational implicature, not an entailment. (2) Events which consist of iterated "minimal events" (Rothstein, 2004) are flexible accomplishments; however, not all flexible accomplishments consist of iterated minimal events. (4) ASL dynamic verb/quantized argument predicates lack the endpoint-inclusion inference due to their explicit iconic reference to minimal events. (5) The endpoint-inclusion inference of flexible accomplishments in English is due to a basic inference that the action of the verb in dynamic verb/quantized argument predicates covers/affects the whole extent of an object/path/scale, but specific world knowledge in the form of stereotypicality features outranks this inference.

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Chapter 1: Introduction

Imagine viewing clips from a film showing a space capsule suspended several hundred kilometers above the Earth's moon. Inside this space capsule is dog named Bobik. Under what circumstances do we judge the following sentences as true?

(1) a. Bobik orbited the Moon.
     b. Bobik is orbiting the Moon.
     c. Bobik mapped the Moon's surface.
     d. Bobik is mapping the Moon's surface.

How much of the film do we need to see to judge that (1b) is true? Most would judge it as true after only seeing the shape of the path Bobik's space capsule makes in a partial orbit around the Moon. If he travels a considerable distance along a curved path parallel to the Moon's surface, we might say that (1b) is true, but would probably withhold judgment on (1a) until he had arrived back at the point where he started at least once. In fact, (1a) is very easy to judge as true or false based on observation, while (1b) requires an act of inference about likely future outcomes.

Item (1c) poses a special challenge for our judgments that is not encountered in (1a-b). If Bobik has mapped the entire surface of the Moon, creating a contiguous map with no gaps, we will not hesitate to say that (1c) is true. What would our judgment be if we only saw a brief film clip showing him mapping a few parts of the surface? Suppose he only mapped one part of the surface. Technically, he did map something, and that something was (part of) the Moon's surface. Note that we can say without hesitation that (1d) is true, even from observing a brief, incomplete film clip, and, unlike with (1b), we do not even need to know whether Bobik intends to complete the job. However, under what circumstances would we say that (1c) is true?

It is a starting assumption of this study that the answer to the truth of (1c) is not straightforward. When native speakers of English are queried informally about sentences with verbs like *orbit* (and verbs like *repair*, *make*, and *convince*), their judgments are strikingly unanimous. That is not the case when they are queried about verbs like *map* (or verbs like *eat*, *read*, and *sew*). Informants often waver between wanting to require an event to be complete before judging (1c) as true--'complete' in the sense of the action of the verb extending to the limits set by the object, path, or scale represented by its argument(s)--and allowing (1c) to count as true if the action of the verb only extends part-way toward these limits. By contrast, native signers of American Sign Language (ASL) judge signed counterparts of (1a) as false for events that fall short of completion, while judging sentences like (1c) as true with little or no hesitation.

These variable and uncertain intuitions and cross-linguistic differences are the motivation for conducting the experiments outlined in this study. Both *orbit* and *map* are accomplishments on standard Vendlerian criteria. I will give evidence that they do not behave exactly the same, however, with regard to standard tests of native speaker intuitions or psycholinguistic experimental data, in that *orbit* strictly requires event completion in its truth conditions, while *map* does not.

2. RESEARCH QUESTIONS

This dissertation addresses three primary research questions.

2.1 Do [+ADD TO] + [+SQA] predicates have endpoint inclusion as a part of their truth conditions?

It has become a standard assumption in the literature on aspectuality that predicates composed of a dynamic (+ADD TO) verb and quantized (+SQA) arguments are telic (Dowty, 1979; Verkuyl, 1993; Tenny, 1994; Smith, 1991). That is, events

denoted by these predicates contain a natural endpoint (Smith, 1991) which must be reached in order for a sentence with these predicates to be true. This assertion has recently been challenged by researchers including Smollett (2005), Lin (2004), and Gabriele (2008). One aim of this study is to gather by experimental means native-speaker intuitions about the truth of sentences with (+ADD TO)+(+SQA) predicates in contexts where they refer to completed vs. non-completed events, i.e., events which reach their natural endpoint vs. those which do not.

2.2 Is a partition of the class of accomplishments into strict accomplishments (those which have endpoint inclusion in their truth conditions) and flexible accomplishments (those with an implied endpoint, which is not part of their truth conditions) motivated by experimental data?

It is my hypothesis that some accomplishment predicates (such as [*make a box*], [*repair the TV*]) denote the reaching of a natural endpoint, while others (such as [*eat a sandwich*], [*sew a dress*]) do not. Sentences with the former type of predicate, *strict accomplishments*, are false when they refer to non-completed events. Those with the latter type, *flexible accomplishments*, are true, even when they refer to non-completed events, provided some progress has been made in the event towards the endpoint.

2.3 What conceptual factors might lead to a predicate's being flexible vs. strict?

If research question 2.2 can be answered in the affirmative, it would be desirable to know if strict and flexible accomplishments form natural classes with respect to the conceptual structure of events. That is to say, are there commonalities in our conceptualization of the events denoted by predicates that lead these predicates to pattern as flexible or strict?

3. OUTLINE OF DISSERTATION

Chapter 2 of this dissertation is an overview of the literature concerning lexical aspect and the class of accomplishments as well as a statement of the theoretical assumptions that will guide this study. In section 1, I introduce what has become the standard view in the literature on telicity and accomplishments. I review the groundbreaking paper by Vendler (1957) with a focus on accomplishments. I discuss the leading work of Krifka (1989, 1992, 1998) in characterizing telicity and refinements proposed by Beavers (2008, 2012). Verkuyl's (1993) clause-level schema for computing terminativity is outlined. Challenges to the standard view (Lin, 2004; Smollett 2005) are introduced. In section 2, I outline the theoretical assumptions that have informed the experiments and analyses presented in this study, in particular, the limitations I have chosen to place on the questions under study. This study concerns clause-level lexical aspect, the aspectual value that arises from the interaction of verbs and their argument(s). I explain my criteria for considering predicates as accomplishments vs. achievements. I discuss issues of precise description, which are orthogonal to the issues considered in this study. Finally, I give a brief overview of the observable differences, on the basis of classical and some new tests, between flexible and strict accomplishments.

In Chapter 3 I describe an experiment, *English Aspectual Classes* (*EAS*), designed to determine whether native English speakers judge sentences featuring verb constellations with verbs from the four Vendler classes (states, activities, accomplishments, and achievements) and quantized direct objects as true or false when presented in the context of a non-completed event. Participants viewed wordless video scenarios showing an actor performing actions completely and incompletely. Participants were then shown a sentence in English relating to the action performed featuring a verb in the preterite with a quantized direct object. They were asked to judge this sentence as

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true or false. Sentences featuring certain verbs of a sizeable class were judged as true by a majority of respondents after viewing non-completed scenarios, which is surprising given standard ideas in the literature about the telicity of dynamic verb/quantized argument predicates.

In Chapter 4 I describe a second experiment, *English Lexical Aspect and Event Structure* (henceforth: *English Experiment Two*), designed after the manner of English Experiment One but focusing only on accomplishments. I expanded the number and type of accomplishments and included a much larger number of participants than in English Experiment One. This experiment used text-based scenarios which participants read instead of video scenarios. As in English Experiment One, sentences featuring certain verbs were judged as true by a surprising majority of respondents after viewing non-completed scenarios.

In Chapter 5, I describe a third experiment, *American Sign Language Aspectual Classes* (henceforth: *The ASL Experiment*), which was the counterpart of English Experiment One for native Deaf signers of American Sign Language (ASL). The same wordless video scenario stimuli were used in the ASL experiment as in English Experiment One, and ASL versions of the sentences (signed by native signers via video) were presented to the participants for their judgments of truth or falsity. The results were similar to those found in English Experiment One and English Experiment Two: sentences featuring certain verbs were judged as true by a majority of respondents after viewing non-completed scenarios. For many of these verbs, however, judgments were much more categorical than in the English experiments, and judgments of true were in many cases nearly unanimous.

In Chapter 6 I synthesize and analyze the results of the three experiments in the light of classic and new native-speaker judgment tests. I give evidence for a negative

answer to research question 2.1 above: [+ADD TO] + [+SQA] predicates do not have endpoint inclusion as a part of their truth conditions. I give support for an affirmative answer to research question 2.2 above: the class of accomplishments can be subdivided into strict accomplishments and flexible accomplishments. In answer to research question 2.3 above, I give support for the view that accomplishments with the atomic minimal event property (i.e., those which denote events consisting of one or more discrete sub-events, all of these sub-events being tokens of one uniform type of event) are flexible accomplishments. However, some predicates without the atomic minimal event property, especially those of construction, appeared to permit flexible, endpoint-non-inclusive readings as well. I argue that atomic minimal events serve as the target for ASL's iconic lexicalization strategy for many verbs, which, as a result, are flexible accomplishments.

In Chapter 7 I summarize the conclusions drawn from this study. I discuss some methodological challenges which may be of special interest. I also outline new directions for research suggested by the results of this study.

Chapter 2: Background and Theoretical Assumptions

1. BACKGROUND

1.1 Aspectual Classification

1.1.1 The Traditional Vendler Classes

A classic paper by Vendler (1957) served as the foundation upon which much current theoretical work on lexical aspect is built. In this paper, the four traditional categories of *state*, *activity*, *accomplishment*, and *achievement* were first introduced, and some classic tests for membership by verbs in these categories were set out. Vendler defined his four *time schemata* for verbs in terms of the properties of dynamicity and durativity.

States are durative, but non-dynamic. That is, they obtain over time, "last for a period of time" (p. 147), but contain no discrete stages. States are qualities which can be predicated of a subject, and they can hold for a longer or shorter amount of time. They can be stable, habitual qualities of a subject, or ephemeral qualities; they are not, however, things which a subject "does" or which "happen." Verbs that express states can be distinguished from those that express events, in part, by their incompatibility with progressive constructions.

(1)   a. Bill is rich.
       b. #Bill is being rich.

(2)   a. Naomi likes backgammon.
       b. #Naomi is liking backgammon.

Activities are events; that is, they things which can "happen." They are "processes going on in time" (p. 144-145), and have discrete stages, which are, however, homogeneous. Each separate stage is an instance of the activity denoted by the verb.

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Hence, the truth of the progressive form of an activity sentence entails the truth of the corresponding present perfect sentence:

(3) a. Alene is walking. ---> Alene has walked.
     b. Jason is thinking. ---> Jason has thought.

Accomplishments are processes, like activities, but additionally contain an endpoint, a final stage at which the event is concluded and can proceed no further. Hence, unlike the case with activities, the discrete stages of an accomplishment are not all homogeneous. Activities and accomplishments may be contrasted by the lack of an entailment relation between accomplishment sentences in the progressive and present perfect forms:

(4) Jeremy is organizing a party. --/--> Jeremy has organized a party.
(5) Adrian is drawing a circle. --/--> Adrian has drawn a circle.

Additionally, the question "How long did it take *x* to do *y*" can sensibly be asked of accomplishments, but not of activities:

(6) a. How long did it take Adrian to draw a circle?
     b. #How long did it take Fran to saunter?

Item (6b) is infelicitous (barring the inceptive reading); it does not take any time to saunter. Sauntering occurs over a space of time or "for" a given time, but not "in" x amount of time:

(7) a. Adrian drew a circle in/#for ten seconds.
     b. Fran sauntered for/#in several minutes.

Achievements are events which "happen," but are non-durative. They do not "last for a period of time," (p. 147) but rather occur in an instant of time. Events denoted by achievement verbs "constitute a unique and indivisible time instant" (p. 155). Achievement verbs "can be predicated only for single moments of time."

(8)   a. Gary spotted the plane at 12:00 noon.
       b. Gary spotted the plane in ten seconds. (seeing began within ten seconds)
       c. #Gary spotted the plane for two minutes.

While various refinements have followed Vendler's basic paradigm, with theorists departing from his taxonomy in terms of the number of classes and criteria for membership, as well as the precise characterization of given predicates, the use of various construals of dynamicity and durativity as features of classification remains quite relevant in current theory.

It is evident that, among the four classifications, the most complex schema is that for accomplishments. According to Vendler, accomplishments denote an event which is time-extensive, has discrete stages, and has an obligatory endpoint. States lack discrete stages. Activities lack an endpoint. Achievements lack time extension. Only accomplishments have time extension, discrete stages, and an endpoint. By virtue of their semantic complexity, it would be natural to suspect that verbs associated with lexical accomplishment predicates are a more marked class typologically. In fact, I will later argue that verb/argument constellations which denote multi-stage events with an obligatory endpoint (as a function of the semantic values of the verbs in conjunction with their arguments, with no need for the input of adverbials or other adjuncts), are rare in English and mostly Latinate. As I will discuss in Chapter 5, I have been able to identify only one true lexical accomplishment in American Sign Language (ASL), the verb MAKE. ASL otherwise requires the use of post-verbal particles for unambiguous endpoint inclusion readings.

Vendler noted that a given reading of a verb can be derived from that of its more primary schema, a phenomenon more commonly known today as 'coercion.'

(9) a. Rhonda is driving a cab.
     b. Rhonda drives a cab.

In (9a), [*drive a cab*], used in the progressive, is an activity. In (9b) this same verb expresses a state in the simple present tense. According to Vendler, the stative meaning of [*drive a cab*] is derived from the activity meaning. The felicitous use of the progressive in (9a), not typically compatible with states, suggests that the primary schema of [*drive a cab*] is that of activity.

This phenomenon of derived readings must be distinguished from that of verbs with multiple senses, each having a distinct time schema.

(10) a. Cedric knows the answer.
      b. Suddenly, Cedric knew the answer.

(11) a. Cedric drives a cab.
      b. Cedric started driving a cab.
      c. #Cedric started knowing the answer.

The items in (10) and (11) show that 'know' has two senses with distinct time schemata. The (10a) sense of 'know' is stative. If Cedric knows the answer, he knows it even when not thinking about it. In fact [*know the answer*] can be correctly predicated of Cedric even while he is asleep. In contrast, the (10b) sense of [*know the answer*] is an achievement. Vendler suggests that (10b) is not derived from the stative reading of [*know the answer*], i.e., is not an inceptive reading. Note that (11c), a paraphrase of this reading, is infelicitous, while (11b), expressing an achievement derived from the activity [*drive a cab*], is felicitous. Thus, [*know the answer*] comes by its achievement reading via the use of a different sense of 'know' than the usual stative sense, whereas the achievement [*start driving a cab*] is derived from the same sense of 'drive' as the activity [*drive a cab*].

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In this connection, a further observation by Vendler deserves special attention in the context of the current study. Vendler notes that for some states, such as being a cab driver, it is possible to say something like (12).

(12)   a. Cedric is a cab driver.
        b. Cedric drives a cab.
        c. Cedric is driving a cab.
        d. Cedric drove a cab all morning.

However, for other states such as [*rule Cambodia*], on Vendler's view, it is not possible to say something like (13c) or (13d).

(13)   a. Norodom Sihamoni is the ruler of Cambodia.
        b. Norodom Sihamoni rules Cambodia.
        c. #Norodom Sihamoni is ruling Cambodia.
        d. #Norodom Sihamoni ruled Cambodia all morning.

Why can [*drive a cab*] be time-delimited in this way with the preterite and a time adverbial construction, and the use of the progressive is felicitous, while this is not true of [*rule Cambodia*]? Vendler invokes Reyle's (2009)[1949] distinction between 'specific' states and 'generic' states.

> In short, some dispositional words are highly generic or determinable, while others are highly specific or determinate; the verbs with which we report the different exercises of generic tendencies, capacities and liabilities are apt to differ from the verbs with which we name the dispositions, while the episodic verbs corresponding to the highly specific dispositional verbs are apt to be the same. A baker can be baking now, but a grocer is not described as 'grocing' now, but only as selling sugar now, or weighing tea now, or wrapping up butter now. There are halfway houses. With qualms we will speak of a doctor as engaged now in doctoring someone, though not of a solicitor as now solicitoring, but only as now drafting a will, or now defending a client (Reyle, 2009:102 [1949]).

Specific states are those which are derived from "uniform" actions. Driving a cab is a uniform action involving the micro-events (steering, accelerating, braking, etc.) which constitute one uniform predicate of 'driving'. Other examples of uniform actions are smoking, painting, and writing. Generic states are those which are derived from multifarious actions. Ruling a country involves a variety of actions (issuing decrees, making appointments to cabinet, directing generals in military matters, attending state banquets, receiving ambassadors), none of which individually constitute 'ruling.' Hence, it is possible to say that Cedric drove his cab (or smoked, painted, wrote) from 8:00 to 12:00, or that Cedric is doing so at a given moment, but it is not possible to say that Norodom Sihamoni ruled Cambodia from 8:00 to 12:00, or that he is doing so at any given moment.

One tangible form of evidence that there is a difference between specific and generic states (using Vendler's terminology) are some facts pertaining to verification. If an observer sees Cedric driving a cab between 8:01 and 8:02, she has grounds for asserting the truth of (12c) on the basis of this observation alone. This is because driving a cab involves a limited number of actions (steering, accelerating, etc.) which can be immediately observed while [*drive a cab*] is going on. We can know for sure that Cedric is not driving a cab if he is not behind the wheel, for example.

This contrasts with the case for [*rule Cambodia*]. An observer cannot, merely by viewing the actions of Norodom Sihamoni from 8:01 to 8:02, know that he is ruling Cambodia during this time interval. He may be doing things consistent with his rule, such as signing papers, giving orders to subordinates, etc., but an observer would not have grounds for asserting the truth of (13c) solely on the basis of this observation. Other facts that she happened to know about Norodom Sihamoni, such as his status as ruler of Cambodia, would be needed in order to give grounds for this judgment. No such

supplementary information is needed to conclude from a short observation that (12c) is true.

This distinction made by Vendler and Reyle for states can also be made for accomplishments, and this distinction will figure in my account of strict vs. flexible accomplishments. It will be seen that predicates denoting uniform actions are flexible accomplishments.

1.1.2 Semelfactives

Some predicates denote events which are individually punctual, such as *cough*, *knock*, *flash*, but are thought of as typically occurring in iteration, a series of punctual events. Strictly speaking, predicates of this class, called *semelfactives* (Comrie, 1976; Smith, 1991), are ambiguous in neutral contexts between single-event and iterative readings. In the terminology of Moens & Steedman (1988), the events denoted by these predicates are *points*.

(14) a. Sarah coughed.
      b. Sarah coughed until the fishbone was dislodged.

(15) a. Theo knocked on the door.
      b. Theo knocked frantically on the door.

Item (14a) is ambiguous. It could mean that Sarah coughed a single time, or several times. The *until*-phrase in (14b) coerces an iterative reading. Item (15a) is also ambiguous, in the strict sense, but an iterative reading is more natural on the basis of world knowledge; in (15b), it is clear from the use of the adverb that a time-extended, iterative reading is intended.

The distinction made between semelfactives and achievements is that, while both are instantaneous, the latter entail result states (e.g., *cross the border, pass the exam*), while the former are non-resultative (Moens & Steedman, 1988; Smith, 1991). Their non-

resultative nature leads Smith to classify them, even in their single-event readings, as atelic, while other authors, such as Dowty (1979), include them in the class of achievements. Achievements, like semelfactives, are coerced into iterative readings by *for*+time expression constructions and *until* phrases, as (16) and (17) demonstrate.

(16) a. Rhonda passed the finish line.
      b. Rhonda passed the finish line for hours.[1]

(17) a. Leon broke the vase.
      b. Leon broke the vase until it was unrecognizable.

In designing the experiments that form the basis for this study, it has been my practice to exclude predicates that have the semelfactive/iterative ambiguity in neutral contexts. I chose only predicates from the four traditional Vendler classes due to the controversial nature of semelfactives and because the latter are clearly much like achievements in being instantaneous in their single-event readings; thus, their status as to endpoint inclusion seems clear and to overlap with that of achievements, which were included in the first two experiments on English and ASL. I will have more to say in Chapter 6, however, about the link between semelfactives and the *atomic minimal events*--in the light of work by Rothstein (2004, 2008)--that I claim form part of the basis for membership in my hypothesized class of flexible accomplishments.

1.1.3 Telicity

The distinction between atelic predicates, which represent events that can continue--in principle--indefinitely, and telic predicates, which represent events that must, of ontological necessity, cease at some natural point, has long served as a basis for lexical aspectual classification, as noted in the overview of Vender's schema in section

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[1] The context required for this iterative reading to be available is a very strange situation: Rhonda repeatedly crosses the finish line, perhaps backing up and crossing again and again.

1.2. Much research has been devoted to how telicity arises from the interaction between the semantic features of verbs and their arguments. In this section I will review what has emerged as the standard view on the nature of this relationship. The literature in this area is vast, and this section will serve only to draw some prominent common points in the research that has attempted to characterize telicity. What are the constituent parts of telicity? On the standard view, a semantic value of change and a semantic value of a boundary to that change combine to give rise to a telic event. The two chief elements which have been considered of relevance to the telic/atelic nature of a clause are the dynamicity of the verb--corresponding to change-- and the quantization of its argument NP(s)--corresponding to the boundary of change. These are considered in turn in the sections which follow.

1.1.3.1 Dynamicity

A dynamic verb is one which involves change or movement. Arguably, all verbs except statives involve change or movement, but dynamicity has a more specific sense relevant to the issues in aspectuality. Tenny (1994), argues that dynamic verbs involve necessary (not merely potential) internal change in their arguments. Internal change arises when an argument is affected in such a way that there is change to its parts. Some examples will illustrate.

(18)   Ray pushed the button.
(19)   Ray pushed the display.
(20)   Ray pushed over the display.
(21)   Ray pushed the cart.
(22)   Ray pushed the wall.
(23)   Ray dented the cart.

In (18-22), three uses of *push* are shown. In (18), the button is changed in being displaced from its default position. The button does not change internally, however. The

relationship of the parts of its mass to each other is not changed by pushing. In (19), likewise, Ray displaces the display, but does not necessarily alter its internal structure, for pushing it (gently) may not result in collapse. In (20), the use of the particle *over* makes it clear that the display collapses; its parts change in their relationship to one another, an internal change. In (21), the cart may be displaced from its initial position, but if it is, it does not change internally. If it is a very heavy cart, pushing it may result in no movement. Likewise, in (22), the wall will most likely not move even if it is pushed very forcefully. In (23), the cart is necessarily changed internally; a dent is an internal change.

As seen from (18-22), *push*, while involving some input of energy, and often resulting in a change of position of the object, does not necessarily involve internal change. Item (20), which does unambiguously involve internal change, requires the use of the particle *over* to make this explicit. Thus, *push* is not a dynamic verb. By contrast, *dent* necessarily involves internal change and, as such, is a dynamic verb.

The proviso made by Tenny of 'necessary change' places an interesting constraint on the interpretation of these predicates. Verbs like *push* and *touch* denote events which may result in some movement or change of the internal argument, and this change could be internal or external.

(24) a. Jan deformed the wet clay.
      b. Jan deformed the wet clay for fifteen seconds.
      c. Jan deformed the wet clay in fifteen seconds.
      d. It took Jan fifteen seconds to deform the wet clay.

(25) a. Jan touched the wet clay.
      b. Jan touched the wet clay for fifteen seconds.
      c. Jan touched the wet clay in fifteen seconds.
      d. It took Jan fifteen seconds to touch the wet clay.

(26) a. Jan pushed the wet clay.
      b. Jan pushed the wet clay for fifteen seconds.
      c. Jan pushed the wet clay in fifteen seconds.

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d. It took Jan fifteen seconds to push the wet clay.

All of the items in (24)-(26) are acceptable, but interpretations vary in an interesting way. In the case of (24c), either an inceptive reading or a duration-to-completion reading is possible. Item (24d) makes it clear that a duration-to-completion reading is available. In (24b), iterative deforming movements are strongly implied. In (25c) and (25d), only an inceptive reading is available. By contrast with (24b), for (25b) a prolonged touching event, with no iterations or movement, is a possible reading. Items (26c) and (26d) permit only inceptive readings. They do not mean that a single pushing event reached its endpoint in fifteen seconds. Item (26b) is compatible with an extended pushing event without movement or deformation of the clay (perhaps the clay is very firm). Importantly, neither *touch* nor *push* necessarily involve change, internal or otherwise, while *deform* necessarily involves internal change.

The pattern that emerges in (24) - (26) is that a dynamic verb, like *deform*, permits only an iterative interpretation with *for*+time expression adverbials, while non-dynamic verbs like *touch* and *push*, permit both prolonged, single-event and iterative readings. With *in*+time expression adverbials, dynamic verbs permit duration-to-completion readings or inceptive readings, while non-dynamic verbs permit only inceptive readings. Hence, Tenny's 'necessary change' proviso in her definition of dynamic verbs is supported by the classical *for/in*-time expression tests. Some verbs which--unlike *touch* and *push*--necessarily involve change, but not internal change, include: *propel*, *shake*, *spin*.

Some scalar predicates, such as *widen, heat, cool, inflate* (Hay, Kennedy & Levin, 1999), involve internal change, and are thus dynamic, yet they pattern with non-dynamic verbs in that they permit non-iterative, single-event readings with *for*+time expression adverbials. This is because, as Hay et al. observe, these predicates are associated with

scales which permit interpretations involving the reaching of the maximal endpoint on the scale or the reaching of a non-specific endpoint short of the maximal one, as the acceptability with either *for/in* in (27) and (28) show.

(27)   Tammy inflated the balloon for/in a few minutes.
(28)   Josh heated the pizza for/in ten minutes.

Tenny's proviso of internal change and Hay, Kennedy & Levin's notion of scale-associated change both relate to a basic insight: dynamicity represents not just movement/change, but change against the background of some type of landmark. The moving/changing entities participating in an event associated with a dynamic verb move or change with respect to some point of reference.

1.1.3.2 Quantization

The arguments of verbs can denote single discrete entities, multiple discrete entities of definite number, multiple discrete entities of unspecified number, undifferentiated masses, sections of the physical mass of entities, and locations on entities (such as endpoints of paths). The differential contribution of these types of argument to the aspectual semantics of a clause have been the focal point of much discussion in the literature. A basic factor relevant to aspectuality is the property of an argument to establish a boundary for an event. A quantized argument is one that has definite boundaries which may be referenced in interpreting the limits of movement or change in an event.

Arguments can be quantized in a number of ways. Numerically-specified count-noun NPs, plural countable and mass nouns with definite articles, and singular count nouns are quantized (Dowty, 1979; Smith, 1991; Verkuyl, 1994), as the items in (29) show, using the *in/for* phrase test.

(29)   a. Rachel ate three donuts in/#for ten mintues.
        b. Rachel ate a donut in/?for ten minutes.
        c. Rachel ate the donuts in/?for ten minutes.
        d. Rachel ate the oatmeal in/?for ten minutes.

Bare mass nouns, bare plurals, NPs with indefinite determiners and mass or plural count nouns are non-quantized, as the examples in (30) show.

(30)   a. Seth drank coffee for/#in hours.
        b. Seth drank cups of coffee for/#in hours.
        c. Seth drank some coffee for/#in hours.
        d. Seth ate some donuts for/#in hours.

Items (30a-d), with the dynamic verb *drink*, but with non-quantized internal arguments, are only compatible with *for*+time expression constructions, and not with *in*+time expression phrases.

On the standard view, the verb in a telic predicate relates the action of its external argument to the recipient of that action, the internal argument, such that the limits of the internal argument determine the temporal limits of the event. A count noun denotes an entity with definite boundaries. Similarly, the use of a definite determiner gives a mass NP definite reference: *the coffee* in a given discourse context refers to a quantity of coffee with definite boundaries. In either case, the boundaries of the entity denoted by the internal argument serve to make the boundaries of the action of the verb explicit. For non-quantized internal arguments, no such boundary is available to delimit the action of the verb.

1.1.3.3 Verkuyl's Clause-level Schema

A useful schema is given in Verkuyl (1993) to represent the semantic contributions of the syntactic constituents of clauses as regards telicity. This schema is reproduced in Figure 1 below.

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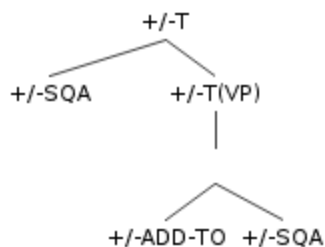
Figure 1: Clause-level Schema
for Contributions of Clausal Constituents to telicity
(From Verkuyl, 1993: 28)

In this schema, *T* in [+/- T] stands for terminative (telic) aspect. The feature [+/-ADD TO] indicates that the verb is dynamic: it features change or movement with respect to a scale. The feature [+/- SQA] indicates that the NP argument of the verb is quantized: it has definite natural limit. Examples include definite count nouns or nouns modified by a numeral. If the [+/-ADD TO] feature for the verb and the [+/- SQA] for its internal argument are both positive, the VP node is [+T], otherwise, it is [-T]. Likewise, if the [+/- T] feature of the VP node and the [+/- SQA] feature of the verb's external argument are both positive, the clausal node is [+T], otherwise it is [-T]. The role of the external argument of the verb in aspectual composition shown here is controversial. Tenny (1994) discounts entirely the role of the external argument in determining the telicity of a clause, and gives arguments and linguistic examples which show that, at the very least, the picture with regard to external arguments is not clear. Test-case sentences with [-SQA] subjects and [+T] VPs, are often odd for hard-to-pinpoint reasons and problematic in terms of interpretation.[2] I will confine my attention in this study to the interplay between

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[2] Examples include such sentences as #*The girl ate a sandwich for hours* vs. ?*Girls ate a sandwich for hours*. The clause *The girl ate a sandwich*, with a singular subject NP, is odd with *for hours*, as the count noun of the VP [*eat a sandwich*] provides a bound for the event, making it telic. This same VP with a bare plural subject, *Girls,* may be more acceptable, as now multiple sandwich-eating events (of different

the verb and its internal argument. In line with this, Figure 1 shows in schematic form the standard view with regard to this relationship: when a verb is dynamic and its argument is delimited/quantized, telicity is the result. VPs not matching this configuration are atelic.

1.1.3.4 Abstract Movement and the Event-Argument Homomorphism

A formal account of the relationship discussed above, between our conceptualization of the structure of events and their linguistic representation in terms of lexical semantic information associated with verbs and their arguments, has been the aim of much reseach (Dowty, 1979; Verkuyl, 1994; Krifka, 1987, 1992, 1998; Filip, 1999; Rothstein, 2004; Beavers 2008, 2012). A highly influential schema for uniting the semantic information contributed by a dynamic verb with that of its argument(s), yielding a value for the property of telicity, was introduced by Krifka (1987, 1992, 1998). This schema identifies the object arguments of verbs as providing the crucial factor in setting the boundary of an event. In particular, parts of arguments stand in a homomorphic relation to parts of events. Krifka established two types of relations to model two types of event/argument mapping denoted by predicates of change. (Strict) Movement Relations ((S)MRs) model the mapping between parts of events and subpaths of paths (represented by the internal argument of the verb) traversed by a referent represented by the external argument of motion verbs. (Strictly) Incremental Relations ((S)INCs) model the mapping between parts of events and parts of objects affected by the action of the verb.

In characterizing predicates of path-directed movement, Krifka links the parts of verbal arguments to parts of events using Link's (1983) part structures. Adjacency

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sandwiches) by different girls is a possibility. Nonetheless, *Girls ate a sandwich for hours* is unquestionably odd. It is difficult to say if this is because there is an uncertainty in the type of reference *a sandwich* has here (reference of an entity type vs. reference to individual tokens) or for some other reason.

structures and path structures model the relationship of parts of arguments to parts of events in terms of adjacency, precedence and overlap. Krifka defines (Strict) Movement Relations ((S)MRs). A predicate θ is an SMR if it is a mapping from parts of paths to parts of events such that, (i) (*Adjacency*) For all x, y, and z elements of the connected path universe, and for all e, e', and e'', elements of the event universe, if $\theta(x, e)$ and e', e'' are parts of e, and y and z are subpaths of x, and $\theta(y, e')$ and $\theta(z, e'')$, then e' is temporally-adjacent to e'' if and only if y is adjacent to z; (ii) (*Mapping-to-objects*) For all x elements of the connected path universe, and all e, e'' elements of the event universe, if $\theta(x, e)$ and e' is a part of e, then there exists some y such that y is a part of x and $\theta(y, e')$; (iii) For all x elements of the path universe and for all e elements of the event universe, if $\theta(x, e)$, then x is an element of the connected path universe.

Predicates of movement along a path are MRs. In item (31), the agent moves along a path to reach a goal.

(31)   a. Noel walked from the General Store to the city limits.
        b. Noel walked the Lone Star Trail.

In (31a), the agent traverses a well-defined path with an overtly-specified beginning and ending point. In our typical, rough-grained conceptualization of this event, he makes contact with every part of a path that goes from the General Store to the city limits. There is a first part of this path, a second, a third, etc., until the end, and he traverses each of these subpaths once in this order. The event consists of Noel beginning at the starting point, traversing a number of medial subpaths, and ending at the ending point. This is also a natural interpretation of (31b); the Lone Star Trail has a well-defined beginning point and ending point, and one reading of (31b) is that Noel traversed this entire path from beginning to end. However, because the beginning and ending points are not overtly

specified, it would be fine to describe a Noel's walking of only a part of the trail using (31b).

Many movement events are not such that temporal adjacency entails physical adjacency of subpaths or vice-versa. In (31a) Noel may retrace his steps such that two temporally-adjacent subevents are mapped to the same subpath (which violates adjacency: a path is not adjacent to itself; adjacent paths must be non-overlapping), or there may be loops in his path, such that he traverses two adjacent paths at temporally non-contiguous subevents.. Movement Relations (MRs) dispense with condition that temporal precedence entails spatial precedence and vice-versa.

Verbs of consumption and construction can be modeled using (Strictly) Incremental Relations (SINCs). A predicate θ is a SINC if it is a mapping from parts of objects to parts of events such that, for an event e and an individual x, such that $\theta(e, x)$, (i): For every $e' <$ of e, there is exactly one $y < x$ such that $\theta(e', y)$, and (ii): for every y, proper part of x, there is exactly one $e' < e$, such that $\theta(e', y)$. The predicate [*eat porridge*] is a good example of a SINC. For an event corresponding to [*eat porridge*], every spoonful of porridge is a unique proper part of the referent of *porridge*. Each of these proper parts of *porridge* maps to a unique sub-event of [*eat porridge*]. Other consumption predicates and predicates of creation/construction are similar.

(32)   Noel drank a cup of coffee.
(33)   Noel crocheted a vest.
(34)   The pan of water evaporated.

In (32) Noel takes a number of sips of coffee. The quantity of coffee in the cup is consumed in a series of sips until the goal is reached: there is no more coffee. In (33), Noel builds up a vest by executing a series of ordered steps, stitches, until the goal is reached, the last stitch, upon the execution of which the vest is complete. In (34), a given

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quantity of water is present in the pan at the starting point of the event. Over a given period of time, the level of water in the pan moves toward the *empty* endpoint on a *full<-->empty* scale until a goal of sorts is reached: no more water is left in it (on a salient interpretation of (34)).

Acts of eating are typically well-behaved. In an event of eating porridge, no proper part of porridge is affected by the action of eat more than once. Many predicates have truth conditions which can accommodate less well-behaved events; [*read a book*] is such a predicate. Within a single event of [*read a book*], I can re-read words, sentences, chapters, etc., previously read. For example, if I read the first word y of the book three times, each re-reading constitutes a new, different e', e'', e''' $< e$, each of which is associated with y. To accommodate this type of event that can instantiate [*read a book*], Krifka proposes an Incremental Relation (INC). A predicate θ is Incremental (INC) if there is a SINC θ' such that $\theta' \subseteq \theta$, and for all individuals x, y and events e, e', if $\theta(x, e)$ and $\theta(y, e')$, then θ relates the sum of x and y with the sum of e and e'. Hence, a canonical book-reading event, in which each sub-part is read once and maps to a exactly one subevent, is accommodated by the SINC θ' subset of θ; however, in a non-canonical reading event, in which one word y was read three times, $\theta((y \oplus y \oplus y), (e' \oplus e'' \oplus e'''))$[3] holds as well.

Krifka distinguishes between cumulative and quantized predicates. If a predicate P is cumulative, for any entity x such that $P(x)$, if y is a part of x, then $P(y)$. A predicate such as *wine* is cumulative. If $W(x)$ is true, then, for any y which is a part of x, $W(y)$ is true. If a predicate P is quantized, for any entity x such that $P(x)$, then for no proper part y

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[3] $\oplus$ is the sum operation; it is a function from the Cartesian product of the (here) path universe to the path universe that is commutative, associative, and idempotent.

of *x* is it the case that *P(y)*. A predicate such as *a glass of wine* is quantized. No proper part of a glass of wine is a glass of wine.

Hay, Kennedy & Levin (1999) proposed a unified account for predicates involving motion and those involving incremental themes. They claim that predicates of incremental change generally denote a measure of this change (the "difference value") on a gradable property scale. Their approach was chiefly motivated by the need to account for degree achievements. However, by abstracting away from specific types of relational structures designed to account for motion and incremental themes, this approach extends naturally to other types of incremental change.

Hay, Kennedy & Levin (1999) note that many degree achievements are derived from gradable adjectives (e.g., *cool, v.* ← *cool, adj.*; *dry, v.* ← *dry, adj.*). These gradable adjectives denote a property scale: a set of ordered points representing degree of coolness, degree of dryness, etc. The corresponding verbs derived from these adjectives, in turn, represent not a degree of a given property, but an event in which a change in the degree of that property has occurred. If the scale denoted by a de-adjectival verb (inherited from the base form of its corresponding adjective) is bounded (i.e, has at least an upper limit), then the change denoted by the verb will be naturally interpreted as bound also, i.e., the verb will be telic.

These considerations extend also to incremental theme predicates. While incremental theme predicates derive their (a)telicity from properties of both their verbs and the verb's arguments (Dowty, 1979; Tenny, 1994), in contrast with degree achievements, whose (a)telicity derives solely from verb meaning, they are alike in that it is the boundedness property of the scale introduced by the predicate (however derived compositionally) that determines the natural limits (or lack thereof) of the action of the verb. Thus, in general, changes in the extent to which a verb affects its object/theme

correspond to positions on an abstract scale. The measure of changes in degree on this scale is the difference value, whether the property underlying the scale is a quality (coolness, dryness), a path being traversed, or the extent of a physical object (*sandwich* in [*eat a sandwich*]; *novel* in [*read a novel*]).[4]

Beavers (2008) abstracts away from the types of change embodied by the different categories of dynamic predicates described above in (31-34) using the notion of a Generalized Movement Relation, which relates the progress of an event to movement along an abstract scale, building on Krifka's (1998) concept of a Movement Relation. Such a construct is useful in unifying the various types of concrete and abstract movement through a path/scale. Beavers (2012) further develops the concept of movement of entities along paths with Figure Path Relations (FPRs), An FPR is a three-place relation between subparts of the figure *x* (the moving entity) and ordered pairs <*e'*, *p'*> subparts of the event *e* and the path *p*, respectively, such that *e* and *p* are sums of their subevents and subpaths, respectively, where the subpaths terminate in a common goal. Thus movement of potentially spatially discontinuous themes along a potentially multidimensional path can be accommodated, as in a sentence like (35).

(35)   The liter of wine flowed onto the floor in one minute.[5]

Beavers notes that a liter of wine may flow in such a manner that its mass becomes discontinuous: globules of wine may separate from the main mass and travel simultaneously in divergent paths to reach a common goal. This possibility is ruled out by an MR, which requires spatially non-adjacent subpaths to be temporally non-adjacent. An FPR captures these possibilities.

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[4] I will have much more to say about degree achievements and my hypothesized class of flexible accomplishments in Chapter 6.
[5] Adapted from Beavers (2012:40, (2.31)

1.1.4 Challenges to the Standard View

In this section I describe a phenomenon which serves as the focal point for this study: the acceptability of the use of certain predicates typically thought of as accomplishments to describe events which do not reach their canonical endpoint. This phenomenon is one which has not gone completely unnoticed in the literature on aspectuality, but which has received little attention. In what follows, I will set out some evidence for this phenomenon and review what has been written about it in the literature to date.

1.1.4.1 Native English Speaker Judgments

It has been noted by several authors (Tenny, 1994; Kennedy et al., 1999; Kratzer, 2002; Smollett, 2005) that the standard view, outlined above, does not always match the intuitions of native speakers. Informal queries of native English speakers concerning sentences such as (31) often provide surprising answers.

(36)   Kelsey ate a sandwich.

Suppose Kelsey only ate half of the sandwich? On the standard view, it would be false to assert (36); *eat* is clearly a dynamic predicate, as it entails internal change in its internal argument, and *a sandwich* is a quantized NP. However, it was by no means the unanimous view of the English speakers I have queried informally that (36) is false in case the sandwich is not completely consumed. Many speakers feel that an incomplete sandwich-eating event does count as a valid instance of (36), and sentences with similar verb-argument constellations (*read a book*, *draw a picture*, etc.) were judged similarly. The experimental results which I will report in Chapters 3, 4, and 5 are consistent with regards to these variable judgments of native speakers: many native English speakers and native ASL signers accept non-endpoint-inclusive readings of sentences like (36) and

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those with other predicates, such as [*read a book*], [*draw a picture*], [*drink a cup of coffee*], [*peel an orange*], and many others.

In her extensive analysis of 'measuring out' verbs, Tenny (1994) raises the issue of the variant native-speaker judgments mentioned above. For some speakers, she maintains, there is ambiguity in a sentence like (36) between the endpoint-inclusive and non-endpoint-inclusive readings, and she attributes this to inter-speaker variability. Kennedy et al. (1999) and Kratzer (2002) make similar observations.

Smollett (2005) explicitly claims that quantized internal arguments do not 'delimit' events as Tenny (1994) proposed. She notes that Tenny acknowledges variability in the judgments of speakers on sentences of the three main classes she outlines as types of measuring out. Verbs of consumption and verbs of change of state with quantized internal arguments are delimited, according to Tenny, while verbs of performance, as in *Ken played the sonata (in/for five minutes)*, are ambiguous between delimited and non-delimited readings. Smollett notes that this fact undermines Tenny's attempt to give a unified account of measuring-out verbs. Smollett notes that, in fact, the judgments of native speakers concerning dynamic-verb/quantized-internal-argument sentences vary widely between endpoint-inclusive and non-endpoint-inclusive readings. Smollett suggests that the endpoint which quantized internal objects make available can be the source of pragmatically-induced endpoint-inclusion readings, but that they do not delimit obligatorily. Lin (2004) similarly claims that the endpoint-inclusion reading of English sentences like (36) is not a function of truth conditional content, but is a conventional implicature.

1.1.4.2 The Incompleteness Effect

The *incompleteness effect* (IE) (Koenig & Chief, 2008) is a phenomenon which has received some recent attention in the literature and has some bearing on this study. It has been observed that in many languages, such as Mandarin (Koenig & Chief, 2008), Hindi (Koenig & Chief, 2008; Arunchalam & Kotari, 2011), and Thai (Koenig & Muansuwan, 2000; Koenig & Chief, 2008), standard translation equivalents for English verbs which are unambiguously telic are acceptable as descriptions of less-than-complete events. So that, for example, the translation of (36) sounds contradictory to English speakers.

(37)   Xu Mei he Sun Mazi ba Lao Lou sha le   mei sha-si.
        Xu Mei and Sun Mazi BA Lao Lou kill PERF not kill-die
        'Xu Mei and Sun Mazi killed Lao Luo but didn't make him die,' (lit.)

(From Koenig & Chief, 2008:242 (6))

Koenig and Chief give similar examples for Hindi and Thai. Some verbs which they suggest demonstrate this incompleteness effect include: Mandarin *niàn*, Thai *ʔàan*, Hindi *padh* (English translation equivalent: *read),* Hindi *pii* (*drink*), Mandarin *zhŭ* (*cook*), Thai *t`ɛŋ* (*compose (a poem)*), Mandarin *gài* (*build*), Thai *s`ɔm* (*repair*), and Mandarin *quàn* (*persuade*). Koenig and Chief call these verbs incomplete stems. Incomplete stems are verbs that show the incompleteness effect in syntactic contexts in which there is no special endpoint marking, such as that contributed by resultative particles.

One might wonder, in the face of examples like (37), whether it is simply the case that the translation of the verb *sha* into English *kill* was a bad choice. Perhaps *sha* actually means 'bring close to the point of death,' and often gets translated into *kill* because English has no better alternative. This does not seem to be the case. In fact, *sha* most often does get used in the ordinary endpoint-inclusive way, and in fact seems to be

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the most natural interpretation of simple clause with *sha*, without the *mei sha-si* (*not kill-die*) phrase appended. Koenig and Chief note, in fact, that not all native speakers of Mandarin accept (37), although it and other items they give are attested examples found in internet searches (Koenig & Chief, 2008: 343).

Koenig and Chief assert that incomplete stems entail some change on a gradable scale, but do not entail the maximal point on that scale. Crucially, incomplete stems form a relation between the action of the verb and a gradable scale (not necessarily an incremental gradable scale; that is, it is not the case that for every subpart x' of the action x on the part of the external argument of the verb, there is a corresponding unique change $y' < y$, where y is the change on the gradable scale). Verbs, such as Thai *lˆɯaktâŋ* (*vote*) or English *buy*, which denote binary scalar changes (Beavers, 2008) are not incomplete stems.

It is striking that some verbs which will be shown to be unambiguously telic in English (*repair*, *persuade*) have translation equivalents that are incomplete stems in some of the languages discussed by Koenig & Chief. I will argue that in English and ASL, all lexical accomplishment predicates denoting non-binary, incremental gradable changes of state show the IE; in my own terminology, they are flexible accomplishments.

1.1.4.3 Prior Experimental Work

A fair amount of experimental work has been done to investigate the judgments of speakers of various languages as regards the telicity of predicates with dynamic verbs and quantized arguments. Much of this work has been in the area of acquisition, comparing children's judgments with those of adults. Jeschull (2007) tested 22 English-speaking adults and 50 children's judgments concerning the telicity of verb-particle constructions vs. lone verb-object constructions using a truth judgment test on sentences presented in

complete and incomplete contexts. The participants were shown pairs of videos involving two characters each, with one character completing an action such as [*drink his Coke*], and the other character executing a corresponding incomplete action. Participants were asked questions of the form "who drank his Coke?" and "who drank his Coke up?" and could choose one or both characters (in the case of choosing both, this was coded as an equivalent response to choosing the character who performed the non-completed event). Interestingly, in contrast to the experiments I conducted for this study, Jeschull wanted to draw the attention of participants to the issue of the contrast between verb-particle and lone verb-object predicates, and intentionally did not randomize the order of presentation for this factor, but rather presented these forms of the sentences alternatingly. It also does not appear that Jeschull attempted to mask the overall issue of telicity, as no filler or distracter questions are mentioned. What is most relevant in Jeschull's results is that 80% of adults chose the event-completing character for the verb-particle forms, while only 43% chose the event-completing character for the lone verb-object forms; surprisingly, 45% chose the non-event-completing character for lone verb-object forms.

Hacohen (2010) found that nine adult native speakers of Hebrew, presented with a truth-value judgment task for sentences relating to incomplete events only, answered very much as expected based on the standard account of telicity, while 32 children's judgments were non-adult-like up to age 17(!). In Hacohen's study, in contrast to my own, all the stimuli presented incomplete events, and what varied were the sentences presented for judgment in terms of (i) singular (definite and indefinite) and plural definite NP objects (predicted to be telic), (ii) plural indefinite and mass (definite and indefinite) NPs (predicted to be atelic). The stimuli were wordless videos, as in the experiments I conducted for this study. Nine predicates were tested: [close a/the jar(s)], [empty a/the glass(es)], [draw a/the flower(s)], [paint a/the square(s)], and [peel a/the banana(s)], [spill

(the) juice], [scatter (the) popcorn], [collect/gather (the) rice], and [sift (the) flour]. Adults judged hypothesized telic sentences to be false (13% of judgments were 'true') while they judged hypothesized atelic sentences to be true (89% of judgments were 'true'). This contrasts with children, who made less distinction between hypothesized telic and atelic sentences. Children in the 7;9 to 11;11 age group judged 38% of telic sentences as true and 63% of atelic sentences as true. Interestingly, Hacohen found a link between an experiment she conducted showing the late development of the mastery of definiteness (appropriate assignment of the definite article 'ha-') among children acquiring Hebrew and the assignment of telicity to sentences with definite NP objects. It was in this category of definite NP object sentences that the children differed most in their telicity judgments from the adults.

Gabriele (2008) gathered responses from 26 native English speakers and 43 Japanese learners of English concerning the effects of bare plurals vs. definite articles, mass and count nouns, and PP adjuncts on the acceptability judgments for sentences presented in the context of written scenarios. These scenarios presented completed vs. non-completed events. She found that the native English speakers judged ostensibly telic sentences (those with definite articles for count and mass nouns) as acceptable at a surprisingly high rate, comparable with the rates for atelic sentences, with the exception of sentences which were telic by virtue of PP adjuncts. These were judged acceptable in the non-completed context at a much lower rate.[6]

Arunchalam & Kothari (2011) tested the judgments of Hindi and English native speakers regarding their acceptance of non-completed events as instantiating

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[6] In fact, it is likely that, at least in the case of the example Gabriele gives in her paper, there was a problem with the item that caused the judgments of acceptability for this PP adjunct sentence to be even higher in the non-completed context than they likely would have been if different example had been chosen. For the sentence, *Susan carried the bags to the car on Thursday*, the scenario specified that Susan successfully carried two bags, but failed to carry a third all the way. *The bags* has unclear reference in this case.

hypothesized telic predicates. They queried 24 native speakers of Hindi on sentences with *simple perfective* verbs, verbs with a perfective suffix (SV sentences; e.g., *khaa-yaa* (*eat-perfective*)), and sentences with *complex verb forms*, verbs with a perfective suffix and a light verb (*CV sentences*); e.g., *khaa-li-yaa* (*eat-take-perfective*). These sentences were presented in the context of video scenarios of completed and non-completed actions. As with the experiments which I conducted for this study, no participant saw both the completed and non-completed version of the same event; however, the focus on telicity/event-completion does not seem to have been masked with distracter/filler questions. English translations of the predicates used in this experiment are as follows: [*close the door*] [*cover the pot*], [*draw a flower*], [*eat a cookie*], [*extinguish the candle*], [*fill the glass with milk*], [*pluck the twig*], and [*wake him*]. There was a lower acceptance rate (29%) for CV sentences in the non-completed context than for SC sentences (53%).

Arunchalam & Kothari also queried 24 native speakers of English concerning their judgments on a complementary English language task involving the same video scenarios as those used in the Hindi experiment. Simple past-tense English sentences were presented to the participants involving the following predicates, which are mostly translations of the Hindi sentences presented to the Hindi speakers: [*close the door*] [*cover the pot*], [*draw a flower*], [*eat a cookie*], [*extinguish the candle*], [*fill the glass with milk*], [*break off the twig*], and [*wake him*]. Arunchalam & Kothari hypothesized that English speakers' judgments of simple past tense sentences would pattern more with the results for the Hindi CV sentences. However, overall, sentences in the non-completed context were judged as true by the English speakers at 46.9%, as compared with 97.3% for the completed context. It is notable that among the accomplishment predicates, [*draw a flower*], [*eat a cookie*], [*fill the glass with milk*], rates of acceptance for the non-completed condition were much higher (64%, 67%, 95%, respectively), than for the

achievement predicates [*extinguish the candle*] and [*break off the twig*] (8% and 0%, respectively).

It seems that the prior experimental work for English cited here serves to call into question the standard view that predicates with dynamic verbs and quantized arguments are telic in their truth conditions, since a consequence of the standard view is that sentences with these predicates should be false when they refer to non-completed events. The experiments which I will describe in Chapters 3 and 4 replicate the results of Jeschull (2007), Gabriele (2008), and the English results of Arunchalam & Kothari (2011). The first English experiment, described in Chapter 3, differs from these studies in that items from all four Vendler aspectual categories are included, allowing a baseline response to be obtained for items that should be clearly true (e.g., states, activities, completed achievements, and completed accomplishments). The second English experiment, described in Chapter 4, tests a larger number of accomplishment predicates than has been studied to date, as far as I am aware. Both the first and second experiments represent the first time for experiments of this type in English--as far as I know—that both (i) the focus of the experiment on the issue of telicity and event completeness has been masked from participants, and (ii) that the same participant was not able to compare the same completed and non-completed event.[7]

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[7] As far as I can determine, (i) was true for Gabrielle (2008), but not Jeschull (2007) or Arunchalam & Kotari (2011).; (ii) was true for Arunchalam & Kotari, but not for Gabrielle or Jeschull. Both (i) and (ii) were true for Hacohen's (2010) study of Hebrew native speakers.

2. THEORETICAL ASSUMPTIONS

2.1 Lexical Aspect vs. Situation Aspect

Many factors on every level of linguistic structure from the morphological and lexical, as well as pragmatic factors, influence the aspectual interpretations that sentences receive. How clauses come to receive their most basic aspectual meanings--the ones which higher levels of structure take as input for their contributions to aspectual meaning--has long been held to be the product of interactions between verbs and their arguments, and it is this relationship that most concerns the present study.

It has long been held that verbs and their arguments--in Smith's (1991) terminology, the 'verb constellation'--generate a core aspectual meaning for a clause and serve as the basis for categorizing verbs with regard to the traditional Vendler classes (Vendler, 1957; Dowty, 1979; Smith 1991). How the Vendlerian situation type can be further affected by the contributions of non-argument elements of a sentence has also been the object of much research (Moens & Steedman, 1988; Smith, 1991). Pragmatic factors and world knowledge also have roles to play in this regard. We can see some examples of this below.

Dowty (1979) in discussing the activity/accomplishment distinction, notes that certain contexts can license an accomplishment-like reading of activity verb constellations. While this is true, the resulting 'derived' readings (in Smith's (1991) terminology) sometimes do not pass the full range of tests that 'basic-level' situation types do.

(38)   a. Ray made a sandwich.
        b. Ray finished making a sandwich.
        c. Ray made a sandwich in three minutes.   (completive reading only)
        d. Ray almost made a sandwich.   (inceptive and completive readings)

(39)   a. Ray sat on the suitcase.
        b. #Ray finished sitting on the suitcase.
        c. Ray sat on the suitcase in ten minutes.   (inceptive reading only)
        d. Ray almost sat on the suitcase.   (inceptive reading only)

Context: Ray's antique suitcase is warped. He has announced to his family his plan to sit on it for an extended period of time--until he is satisfied it's enough time--each day until he is able to get it closed:

(40)   a. Ray finished sitting on the suitcase, and promptly left for work.
        b. Ray sat on the suitcase in three minutes. (inceptive reading only)
        c. Ray almost sat on the suitcase. (inceptive reading only)

The sentences in (38) and (39) serve to demonstrate that accomplishments (as in (38)), but not activities (as in (39)) may be the complement of *finish* as noted in Dowty (1979). However, (40) shows that some activities may have an accomplishment reading provided the world knowledge context establishes that this activity has an habitual bounding point; item (40a) is felicitous in such a context. This same world-knowledge context is not sufficient, however, to render [*sit on the suitcase*] an accomplishment for the purposes of the *in*+time adverbial or the *almost* tests which Dowty (1979) gives as means of distinguishing between activities and accomplishments, as seen in (40b) and (40c).

Items (38) through (40) show a case in which an activity verb constellation can be coerced by world-knowledge context into an accomplishment. I consider next the opposite direction of coercion.

(41)   a. Sara tinkered with an old radio.
        b. Sara tinkered with an old radio for several minutes.

(42)   a. Sara assembled an old radio.
        b. #Sara assembled an old radio for several minutes.

Suppose there is a situation in which Sara deals with stress by continually putting together and taking apart the same old radio. Some days she will build it two or three times in a row. Other days, she will only get so far, and stop short of a complete assembly of the radio.

(43) a. Sara assembled the radio for several minutes, but when she felt better, she stopped.

b. Sara assembled the radio in several minutes. (completive reading only)

c. Sarah almost assembled the radio.   (inceptive and completive readings).

Items (41), (42) and (43) show the same tendency for basic-level situation types of verb constellations to still preserve their status with regard to some standard tests for category membership, this time in the case where context allows an accomplishment-to-activity coercion. That is to say, the world-knowledge context in this case allows for an activity reading of what is typically a lexical accomplishment predicate, [*assemble the radio*]. Here, (41) shows that this non-prototypical context allows for a shift with regard to the acceptability/ambiguity patterns of [*assemble the radio*] for the *for*+time adverbial test, but not for the *in*+time adverbial or *almost* tests. In the case of these last two tests, [*assemble the radio*], an accomplishment in terms of basic-level Vendlerian categorization, continues to have only a completive reading with *in*+time adverbials, and to be ambiguous between inceptive and completive readings with *almost*, as do accomplishments generally, even in the special context that allowed felicity with a *for*+time adverbial.

It merits further study to consider whether coercions which arise from aspectual morphology or adverbial modification are of a different nature in this regard than those which arise from pragmatic factors arising from special situational contexts (as in the

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case with the radio and suitcase examples above) as evidenced by the interpretations that arise when sentences with coercion triggers are subjected to standard tests as given in Dowty (1979) and Smith (1991), among others. The considerations which arise from (41)-(43), however, are suggestive of a certain persistence of aspectual category membership for verb constellations which have coerced interpretations for some linguistic contexts which give rise to coercions but not others. This forms part of the motivation for this study's exclusive focus on the factors bearing on category membership which are a product of verb-argument relations.

2.2 Accomplishments vs. Achievements

In considering the class of predicates which constitute the object of this study, it will be good to specify on what criteria I have considered a predicate to be an accomplishment. In particular, it can sometimes be a point of some uncertainty as to whether a given verb constellation should be considered an accomplishment or an achievement. I will explore here briefly how this uncertainty arises and on what basis I made my judgments for the purposes of choosing verbs for the experiments.

Accomplishments and achievements are both [+dynamic] and [+telic]. They differ, however, in that the former, and not the latter, have a "non-detachable preparatory phase" (Smith, 1991). An accomplishment is durative and comes to a point of culmination (Moens & Steedman, 1988), and can be thought of as taking time to occur, while an achievement proper obtains only at a given instant.

The phrase "non-detachable preparatory phase" is in need of some consideration. A preparatory phase is often implicit in many events.

(44)   Janet organized a committee.

(45)   Foster made a paper hat.

(46)   Tim corrected the paper.

(47)   Jason went to Dallas.

(48)   Gail killed a snake.

Items (44) - (48) above all at least arguably express accomplishments. They all can take time to occur. For some, however, there are instances in which a durative phase is indispensable, while for others, there may be examples of instantaneous situations which the given sentence would also just as well describe.

Organizing a committee seems unavoidably to take some time, as does making a paper hat and correcting a paper. Going from Austin to Dallas at present certainly takes more than an instant, but going from an adjacent suburb to Dallas may take only one short step, technically speaking. Killing a snake may easily be durative or instantaneous. Gail might have poisoned the snake slowly over several weeks until it died, or she might have shot and killed it instantly.

Even in the case of organizing committees, making paper hats, or correcting papers, it is not difficult, with some imagination, to think of special situations where these tasks might be automated and take only an instant. Almost no situation is exempt from such possibilities, and so we might wonder how best to classify telic verb constellations which may have or lack preparatory phases in given situations.

To answer this question, we might consider an asymmetry which obtains between instantaneous and durative situation types. While an accomplishment may take a shorter or longer time to occur, an instantaneous event necessarily takes no time at all. That is to say, once events which are conceived of as instantaneous are lexicalized as such, they are resistant to a more time-extended conceptualization, perhaps because these are often

lexicalizations of result states. Thus, there may be accomplishments which can be coerced into instantaneous events, but the reverse tends not to occur readily:

(49)   Gail instantly killed the snake.

(50)   Using special software, Tim corrected the paper at the push of a button.

(51)   Using teleportation, Jason went from Austin to Dallas in the blink of an eye.

(52)   #Taking his time with each question, Reza gradually passed the exam.

(53)   #Tierra blinked slowly. (barring iterative reading)

(54)   #Len noticed the dog for a few minutes.

With these considerations in mind, I propose the following conceptual criteria for considering a predicate to be an accomplishment.

(55)   a. Bare accomplishment clauses denote time-extended events by default.

        b. Bare accomplishment clauses have a salient natural endpoint.

By 'bare clause,' I mean the constellation of the verb and its arguments with no adjuncts such as PPs or adverbs. In the English case, a verb in the simple preterite, with no aspectual morphology such as the progressive *-ing*, and only its arguments, exemplifies a bare clause. There is nothing overt in these clauses to independently convey aspectual information or to signal the presence of an endpoint. By defining the territory covered by this study in such narrow terms, I am limiting my scope to exclude a great many instances of accomplishment predicates, in particular those involving adjuncts. My motivation for this decision is that the bare accomplishment clauses best represent Smith's (1991) claim that telicity is, in English, "a covert category."

In the above definitions, I set out in (55a) and (55b) the standard view that accomplishments, from a conceptual standpoint, have a non-detachable preparatory phase (Smith, 1991) and an inherent endpoint, restricting these conditions to the level of the simple, non-aspectually-marked clause. Thus, for the purposes of this study, the key variables relevant to considering a predicate an accomplishment are the features of lexical items, of the verb and its arguments. By extension, a verb is associated with a lexical accomplishment predicate if a bare clause featuring it in construction with quantized NPs meets conditions (55a) and (55b).

A word about (55b) is in order. It is my claim--and that of some authors: Kennedy, et al. (1996), Kratzer (2002), Lin (2004), Smollett (2005)--that not all accomplishments strictly require endpoint inclusion. It is clear that intuitions vary about some predicates, while not varying much about others. What seems to unify accomplishments is the presence of some kind of salient possible endpoint associated with the event. Some predicates seem to be able to pass some of the traditional tests for both telicity and atelicity.

(56)   a. Foster ate the sandwich in three minutes.
        b. Foster ate the sandwich for three minutes (and then stopped).

(57)   a. Foster wrote a play in a few weeks.
        b. Foster wrote a play for a few weeks (and then lost interest).

(58)   a. Carter made a racer in a few weeks.
        b. #Carter made a racer for a few weeks, and then lost interest.

(59)   a. Lena fixed the radio in an hour.
        b. #Lena fixed the radio for an hour.

Items (56) and (57) demonstrate that [*eat a sandwich*] and [*write a play*] can, especially with the right context, be compatible with *for*+time expression constructions as well as with *in*+time expression constructions. Accomplishments should, on the standard view,

only be compatible with the latter, as we see with [*make a racer*] and [*fix the radio*] in (58) and (59).

Another test which can distinguish accomplishments from achievements is coordination with *while*. This test gives similarly variable results with putative accomplishments.

(60)   a. James read *War and Peace*.
        b. James read *War and Peace* while Mona answered e-mails.
        c. James read *War and Peace* while Mona was in the hospital.

(61)   a. James painted a portrait.
        b. James painted a portrait while Mona answered e-mails.

(62)   a. James made a box.
        b. James made a box while Mona answered e-mails.

(63)   a. James convinced Sam to quit smoking.
        b. While Mona answered e-mails, James convinced Sam to quit smoking.

Conjoining a clause containing an accomplishment predicate with one containing an activity can lead to variable readings as seen above. The predicate [*read War and Peace*] is, on standard criteria, an accomplishment. The most natural reading of (60a) is completive, yet it is easily given a non-endpoint inclusion reading with while-coordination as seen in (60b) and (60c). Completive and non-completive readings are allowed for both (60b) and (60c). This seems less likely for (60b) based on the much longer time answering e-mails needed on Mona's part; however, it is an available interpretation.

Examples (60b-c) thus demonstrate that it is not merely the relative stereotypical length of time involved in the respective *while*-conjoined events in (60c) that is operative in the variable completive/non-completive interpretation of [*read War and Peace*].

Similarly, the most natural reading of (61a) is completive, but a non-completive reading of (61b) is available. This is not the case for (62a-b) or (63a-b), which only have completive readings in conjunction with *while*-coordination. I have used this test and the more traditional ones, including the *for/in* distinction, in selecting predicates for the experiment described here.

Condition (55b) is worded so as to convey the notion of an available endpoint that might or might not be strictly required. In accomplishments, some sort of inherent endpoint is salient. This may be, for example, the affectedness of the entire surface of a physical object, the end of a path, or a typical end state. Whether or not these endpoints are strictly included in the denotation of all, or some, or no lexical accomplishment predicates is one of the central questions of this study, but the fact that there is an available salient endpoint for accomplishments in general is shown by the (a) sentences in (56)-(63) above.

Based on these considerations, it will be my practice to consider as accomplishments those predicates which admit of an extended preparatory phase, whether or not this preparatory phase obtains in every conceivable instance to which the predicate applies, and to regard uses of these predicates to denote instantaneous or near-instantaneous events as coercions. I will reserve the category of achievement (or, in some cases semelfactive) to those events which do not readily admit of temporal extension, as in (52)-(54).

2.3 Questions of Precise Description

In discussions about verbal aspect, once it has been proposed that a given verb complex instantiates an accomplishment, certain objections and problematic cases are frequently raised. If a given predicate is telic, it denotes an action that reaches an

endpoint. Isn't it true, however, that many events fail to reach a literal, canonical endpoint, and yet we felicitously use a given predicate to describe them?

(64)   John has closed the door.

(65)   The door is closed.

If we consider (64) to entail (65), and if we take the most literal reading of (64), for John to have closed the door, every part of the surface of the door ends up in contact with a part of the door frame. If this state of affairs obtained at the end of a door-closing event, it would clearly be the case that John closed the door. However, there are many situations in which this requirement is not strictly met, and we might still affirm the truth of (64). Suppose that the door frame has been made or installed imperfectly, so that it is not possible for the areas of the door with which it would normally make contact to all do so at once. Suppose that John has closed the door so that it does make contact with the door frame in all the appropriate areas, but only momentarily. It bounces back open a few millimeters once he has released his grip on the door handle, the lock mechanism keeping it from opening further. In both of these cases, most people would agree that John had nonetheless closed the door.

Suppose that John closes the door substantially, but not all the way to the point where the door touches the frame. It appears closed to a casual observer, and affords privacy, but could be blown back open by a wind. In this case also, most people would affirm the truth of (64). However, this could depend on circumstances. In a context where John has been instructed to keep the door from blowing open, the question "Did John close the door?" would have to be answered "no."

Suppose that John closes the door to a certain point, but leaves a visible gap of two inches between the door and the frame that any casual observer can see. In this case,

it seems reasonable to judge (64) as false, or at least to qualify the statement with "mostly." For some purposes however, this degree of closure might be adequate to judge (65) as true. For a halfway closure of the door, it would be much more difficult to find contexts in which this degree of closure would suffice to make (64) true.

Such factors as these arise in discussions about accomplishments as they pertain to the inclusion or exclusion of an endpoint associated with an event, and the foregoing considerations around the events which might or might not instantiate (64) relate to the nature of that endpoint. There is an extensive philosophical literature on issues of vagueness and the predication of borderline cases, and it seems clear that, to the extent that these issues affect our view of accomplishments, they do not alter the fact that some type of endpoint is required for the truth of an accomplishment sentence.

2.4 Strict vs. Flexible Accomplishments

Within the class of accomplishments, there are some predicates which seem to be unambiguously endpoint-inclusive and others which seem to permit either an endpoint-inclusive or non-endpoint-inclusive reading. I will call the former *strict accomplishments* and the latter *flexible accomplishments*. In this section, I will outline some of the patterns which motivate such a subdivision within the class of accomplishments on the basis of classical and new tests.

2.4.1 In and For+time adverbial Constructions

Certain accomplishment predicates are felicitous with both *in*+time adverbials and *for*+time adverbials, especially in certain contexts, while others infelicitous with for+time adverbials no matter the context.

(66)   a. Jay ate a sandwich in a few minutes.
         b. Dylan knitted a sweater in a few days.
         c. Lynn read *War and Peace* in ten days.

(67)   a. Jay ate a sandwich for a few moments, but realized he didn't like it.
         b. Dylan knitted a sweater for a few hours, but gave up in frustration.
         c. Lynn read *War and Peace* for a few minutes while waiting for the bus.

(68)   a. Karla repaired the watch in half an hour.
         b. Samara made a box in a couple of minutes.
         c. Leon solved the problem in a few minutes.

(69)   a. #Karla repaired the watch for half an hour, but gave up in frustration.
         b. #Samara made a box for a couple of minutes, but soon grew bored and stopped.
         c. #Leon solved the problem for a few minutes, but was called away suddenly.

While it is certainly possible to make sense of the items in (69), on reading them, one feels that the speaker has made a misstatement, and that each of (69a-c) are contradictory. Accurate statements would have involved constructions such as *tried to repair* or *worked on*.

     This is not the case with the items in (67). Again, in this case, there are alternatives that would have been more informative or specific: *Jay ate at/nibbled at a sandwich* or, again, *Dylan worked on* (*knitted on* or *at*?) *a sweater*, but (67a-c) are not contradictory at all. *Eat*, *knit*, *read*, then, are compatible with either *for* or *in*+time adverbials, while *repair*, *make*, and *solve* are only compatible with *in*+time adverbials.

2.4.2 While-coordination

     Some predicates which appear to suggest a completive reading in a neutral context largely lose this implication when put in the context of *while*-coordination; others do not.

(70)   a. Jay played a sonata.
         b. Lynn read War and Peace.
         c. Chris sewed a jacket.

(71) a. Jay played a sonata while the maître d' stole his tips.
      b. Lynn read a novel while Jack napped on the sofa.
      c. Chris sewed a jacket while waiting for the bus.

(72) a. Karla repaired the watch.
      b. Samara made a box.
      c. Leon solved the problem.

(73) a. Karla repaired the watch while watching the news.
      b. Samara made a box while Dusty took pictures for the newsletter.
      c. Leon solved the problem while others were panicking.

The items in (70) all strongly suggest endpoint-inclusion. That is to say, it is natural in the null context to assume that Jay played the sonata to the end, Lynn read to the end, and Chris finished the Jacket. Once these items are placed in a while-coordination context as in (71), however, this suggestion of endpoint-inclusion seems greatly relaxed or eliminated. One might continue (71a) with "Jay stopped and confronted him angrily," and the result would be felicitous. Likewise, Lynn might have not finished the novel while Jack was sleeping, and Chris might have not finished the jacket before getting on the bus.

The situation in (72) and (73) is very different. Again in (72), endpoint-inclusion is strongly suggested in the null context. In fact, it is most likely entailed. Note that even in the *while*-coordination context in (73), however, the endpoint-inclusion readings still seem mandatory. Hence, *play (a sonata)*, *read*, and *sew* behave quite differently in *while*-coordination contexts than *repair*, *make*, and *solve*.

2.4.3 Pauses and Continuations of Action

Certain predicates admit of pauses in the action expressed, followed by taking up that action again, while others do not.

(74) a. Jay played a sonata, paused to take a sip of water, and resumed playing it.
      b. Lynn read War and Peace, took some notes, then read some more.
      c. Chris sewed a jacket, stopped to check the pot roast, then sewed a little more.

(75)   a. #Karla repaired the watch, took a lunch break, then repaired it some more.
        b. #Samara made a box, paused to read the instructions, then resumed making it.
        c. #Leon solved the problem, got called away, then came back and continued
        solving it.

The items in (74), modified from (70) to include pauses in the action, are quite felicitous.
This is in contrast to the items in (75), modified from (72) to include pauses, which are
infelicitous and seemingly contradictory. One a watch has been repaired, it cannot be
repaired any more. This is likewise the case with making a box and solving a problem. It
seems that *play*, *read*, and *sew* permit pauses and continuations of action, while *repair*,
make, and *solve* do not.

2.4.4 Overview

Strict and flexible accomplishments have in common that they denote time-
extended events which have a natural/stereotypical endpoint. Generalizing from the
considerations discussed above in 2.4.1 - 2.4.3, flexible accomplishments permit, in a
sense, direct access to the preparatory phase. Part of the preparatory phase may be
focused and/or arbitrarily designated as terminated short of completion, as with *for*+time
adverbial constructions, or focused as the background for another event, as with *while*-
coordination. Part of the preparatory phase may be focused also for conveying interrupted
action. These are not possibilities for strict accomplishments, whose preparatory phases
may not be accessed independently of the endpoint. In the chapters which follow, I will
support this hypothesized partition of the class of accomplishments into strict and flexible
predicates with cross-linguistic experimental data and further analysis.

Chapter 3: Telicity and Lexical Aspectual Classification in English

1. AN EXPERIMENT ON ENGLISH LEXICAL ASPECT

In this chapter I will report on the results of an experiment involving the judgments of native English speakers regard the truth/falsity of sentences with predicates expressing the Vendlerian categories of state, activity, achievement, and accomplishment. These sentences were presented in the context of wordless video scenarios which showed completed and non-completed events. The aim of this experiment was to determine if native speakers judge sentences denoting (on the standard view) events with natural endpoints as false in the non-completed context, as would be expected given the standard view outlined in Chapter 2.

1.1 Rationale

One of the most time-tested methods for determining a predicate's telicity has been that of consulting one's own intuitions with regard to certain tests proposed by Dowty (1979), of which the *in+time expression* and *for+time expression* tests-- mentioned in Chapter 2 figure most prominently. While their utility is uncontestable, three limitations of these tests motivate the psycholinguistic experiments described in this chapter and in Chapters 4 and 5.

The first limitation is that imposed by the consultation of one's own intuitions or those of others. The lack of unanimity of a group of informants on such queries as may be made in an informal survey is notorious, and if one is to do a thoroughgoing job of making sense of such diversity, a systematic tally of responses is requisite, and a decent-sized pool of informants is also a desideratum. The rudiments of a systematic survey are,

then, already apparent in what constitutes a careful investigation into native-speaker intuitions.

The second limitation relates to the issue of native-speaker ideology and bias. In consulting an informant, it is important that the researcher's opinions regarding the questions at hand not be apparent, so as to avoid confirmation of these opinions as motivations for responses. Even if the researcher's preconceptions are not apparent, however, the informant may have her own biases--or may develop biases in the course of the survey--if it is possible for her to focus consciously on the question at hand. It is preferable, therefore, to construct a survey in such a way that the informant is not even conscious of the linguistic issue under study. In this way, the informants' responses can reveal their unconscious, spontaneous judgments.

The third limitation relates to the source of the judgments native speakers give. To ask if a given sentence is or is not acceptable can be highly revealing, but it may be difficult to determine the source of a lack of acceptability in uncontrolled contexts. For the purposes of this study, which aims at identifying the truth conditions of lexical items, collecting true/false judgments on items presented in a uniform context designed by the researcher may prove most helpful. It is possible in this way avoid conflating truth judgments and felicity judgments. Further, the possibility may be minimized of informants' imagining a context we did not intend to form part of the basis for judgment, a circumstance that could lead to coerced readings where more primary ones were the target of investigation.

1.2 Research Questions

(1)   Do native speakers' judgments on the truth vs. falsity of sentences match
        expected answers based on standard concepts of telicity in the lexical aspect
        literature? In particular, does the view that [+ADD TO] verbs with quantized
        arguments are telic find consistent support in the judgments of native speakers?

(2)   Is a partition of the traditional class of accomplishments into flexible (those that
        permit non-endpoint inclusion) and strict (those that require endpoint inclusion)
        supported by the judgments of native speakers?

In addition to these research questions, a practical goal of the present study is to develop

a cross-linguistically valid experimental means of diagnosing predicates' properties of

telicity. To native speakers of a language, the aspectual properties of a given predicate

may seem obvious. It is clear in English, for example, that "x killed y" entails "y is

dead." The facts reported in Koenig and Chief (2008), however, make it clear that such

an entailment may not hold in Mandarin or Hindi for standard translation equivalents of

kill and *dead*, a fact that many English speakers, including linguists, find quite surprising.

The methodology proposed in this study aims at providing a means for determining the

telicity of predicates in cases where this is difficult to gauge from available resources.

2. METHODOLOGY

Eighteen adult native speakers of English participated in an on-line survey. All of

these participants were personally known to the researcher to be native speakers of

English. Participants took part in the survey using their own computers via the internet using a website designed by the researcher.

Participants viewed a series of fourteen wordless video scenarios in which an actor was shown performing various actions. Each scene contained the same male actor, referred to in the questions as "Ray." Although the scenes were filmed on the same day, care was taken to have the actor change clothes in different scenes so as to avoid the viewer construing the scenes as forming a single narrative. The actor did not speak at all during any of the scenes. To avoid boredom on the part of the participants, some scenes were later edited to speed them up during certain non-crucial parts of the action.

One characteristic example of a scene viewed by participants corresponds to the predicate *eat a sandwich*. In this scene, the actor, identified as Ray, sits at a table. A sandwich is on a plate in front of him. A close-up of this sandwich is shown. Ray begins eating. He takes several bites, chews, and swallows. In the completed version of this scene, he eats all of the sandwich, and there is a final close-up on the empty plate. In the non-completed version, he stops about half-way through the sandwich with an expression of distaste. He throws the remainder of the sandwich into a waste-paper basket. There is a final close-up of the sandwich in the waste-paper basket.

Each participant viewed fourteen out of a total of twenty-eight possible scenes. Participants took one of four administration forms (A, B, C, and D), each of which contained two states, two activities, three completed accomplishments, three uncompleted accomplishments, two completed achievements, and two uncompleted achievements. The scenes were distributed across the administration forms so that no participant viewed both the completed and uncompleted versions of the same scene. Participants were assigned to administration forms by giving out tickets with a password that allowed access to the website which hosted the survey. Each password was

associated in the MySQL database with a given administration form, and the participant was directed through the scenes that made up that form. The password-to-form assignment was such that there was an approximately even number of participants assigned to each form.

The order of presentation of scenes within each form was randomized. Each administration form also contained a number of distracter questions which did not pertain to the issue of event completeness in order to minimize the possibility of participants' consciously considering this issue in answering questions. The order of presentation of distracter questions within each form for which a positive vs. negative answer was anticipated was also randomized. See the Appendix for a full listing of video scenes, their lexical aspect category (based on standard assumptions in the literature) and the question corresponding to each scene.

Before taking part in the survey, participants read the text of the informed consent document and instructions on how to participate and answer questions in the survey. The instructions emphasized--in order to encourage spontaneous responses--that there were no trick questions in the survey, that respondents might find some questions very easy to answer, and that the most obvious answer was probably the correct one. After the survey was completed, each participant read a de-briefing text, which explained the true purpose of the survey and indicated which questions had been research questions and which distracters.

After participants viewed each of the fourteen scenes, an English sentence was presented to them on screen in text. For example, in one scenario, participants viewed a video of "Ray" eating about half of a sandwich and throwing the rest of it away in a trash can (so as to emphasize that the scenario was over, and to discourage the idea that "Ray"

would later resume eating the sandwich). The participant was then presented with the following declarative sentence in English:

(3)   Ray ate a sandwich.

Below each sentence instructions prompted the participants to enter a check into one of three radio buttons and click submit. They were asked to choose the "True" radio button if they thought the sentence they had just read was true, the "False" radio button if they thought the sentence was false, and the "not sure" radio button if they were not sure whether the sentence was true or false. Participants' responses were recorded automatically in a MySQL database.

3. RESULTS

3.1 Overview

A complete breakdown of the participants' responses is found in the Appendix. Informants overwhelmingly judged sentences corresponding to state and activity video scenes as true, as expected. In these video scenes, the actor performed several mundane actions, such as walking or typing on a laptop, or was seen to be in some state such as sitting or standing. Subjects also overwhelmingly judged sentences corresponding to completed Achievement scenes as true, and those corresponding to uncompleted achievement scenes as false, also as expected. These scenes included intuitively obvious achievements such as catching a toy mouse, breaking a cracker in two, or sitting down from a standing position. Although the answers to the questions concerning these achievement items and the state and activity items seem so obvious as not to require explicit experimental investigation, these items nonetheless serve as control conditions for purposes of comparison with more controversial or problematic cases. They also serve as a metric for inter-rater consistency.

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While sentences corresponding to completed Accomplishment scenes were overwhelmingly judged as true, again completely in accordance with standard expectations, sentences corresponding to certain uncompleted Accomplishments were also judged as true at a surprisingly high rate given standard assumptions outlined above in Section 1 about the types of verb constellations featured in these sentences.

3.2 Statistical Analysis

3.2.1 Inter-Rater Reliability

A basic question which this study aims to answer about given predicates in the language under study--in this case, English—is whether speakers largely view a statement containing that predicate as true or false in a given context, i.e., a completed vs. non-completed context. A measure of the extent to which subjects agree in their judgments on sentences containing these given predicates is, thus, a desideratum. For my purposes, a measure of inter-rater reliability seems applicable. I have chosen as a measure of agreement among participants the free-marginal multi-rater Kappa commonly known as Randoph's Kappa (Randolph, 2005).

Measures of inter-rater reliability are commonly used in psychometrics to judge one aspect of the validity of tests: are the raters used to score a given test in substantial agreement, or do they lack agreement? If raters--in psychometric terms--lack agreement, this indicates that the raters as a class are deficient and have not been sufficiently trained to use the same criteria in making their judgments. This is not the viewpoint from which inter-rater reliability is relevant in the current study, however.

In the case of a linguistic analysis, it is a fundamental assumption that members of a speech community are in substantial agreement on certain basic facts about their language. Linguists assume as a starting point that speakers of English are in agreement

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about this language's phonotactics, or the subcategorization frames of given verbs, for example; they then query the judgments of a representative sample of speakers to determine the facts of these cases. Native speakers of English are assumed, in other words, to be reliable raters, in the sense that they should, under the right conditions, be able to give answers to questions that are in accordance with the shared linguistic competence of speakers of English. Chomsky's (1965:3) idealization of the "completely homogeneous speech-community" has long been highly controversial, but has also been much in evidence as a practical principle in the conduct of much useful linguistic research.

Hence, the measure of inter-rater reliability chosen in this study is used here not to judge the reliability of a class of raters, but rather to determine the degree to which, in individual cases, reliable raters converge on a majority judgment. A high Kappa for a majority judgment of a sentence with a given predicate as "true" or "false" indicates that raters were in substantial agreement on the truth or falsity of that sentence. In the present case, a high Kappa for an item can be used to judge the effect of the independent variable, the presentation of a completed vs. a non-completed scenario, on raters' judgments of truth vs. falsity for that item.

When there is a low Kappa for a given item, this indicates that there was not a clear majority judgment on the part of raters. The explanation of this could have many sources, and may vary in individual cases. Perhaps the given item is problematic in terms of the design of the sentence or the scenario that was given for its context. It is also possible that speakers were torn between truth judgments and felicity judgments, for example. In this case, raters might feel that a sentence is not the best description of the event that was presented, and may use this as a criterion for judgment as opposed to truth

in the strict sense. These possibilities will be considered in some detail for individual cases and for the items as a class later in this chapter.

3.2.2 Randolph's Kappa

Randolph's Kappa is a measure of inter-rater agreement, adjusted for chance, which allows for more than two raters and does not assume a given distribution of cases to categories; i.e, raters are not forced to assign a given number of cases to *x* category, a given number to *y* category, etc. This measure is appropriate to the present case, given that raters may assign any number of cases (English sentences) to any of the three categories: *true, false, not sure.*

Randoph's Kappa is given as:

$$
K_{free} = \frac{\frac{1}{Nn\ n-1}(\ \sum_{i=1}^{N}\ \sum_{j=1}^{k} n_{ij^2} - Nn)\ -[\frac{1}{k}]}{1-[\frac{1}{k}]}
$$

Where N is the number of cases, n is the number of raters, and k is the number of rating categories. K_{free} will be used to give a value for agreement among raters on the truth values of individual sentences in the survey. For this purpose, N will be 1, as each individual sentence will be evaluated on its own, so that the number of cases equals one. An acceptable K_{free} for an individual sentence will indicate that raters substantially agreed on the truth value of that sentence at a value adjusted for chance. Randolph (2008) suggests that a K_{free} value of .7 constitutes adequate inter-rater agreement. For very small sets of responses, however, the adjustment for chance that K_{free} introduces may be too robust to make this a useful rule of thumb. For example, K_{free} for a set of six unanimous responses is 1, while for a set of six with one response different, K_{free} is .5. I will consider a K_{free} of .5 adequate agreement for the purposes of this study.

The K_{free} values obtained in this way will be used in this study to determine--based on criteria to be delineated in the next section--if a grouping among the predicates under study is motivated by participants' responses, and whether this grouping corresponds to that suggested by the traditional view discussed in sections 1.1 and 1.2 above. This becomes especially relevant in a consideration of the strict vs. flexible sub-classes of lexical accomplishment predicates which I posit for English. If the K_{free} values for the (hypothesized) flexible accomplishment sentences in the survey are very different from those for the hypothesized strict accomplishment sentences, this will indicate that there is a class of accomplishment predicates for which endpoint inclusion is less of a requirement for truth. In particular, for the case of non-completed contexts, if there are very high values for what are hypothesized to be the strict accomplishment predicates and significantly lower values for those hypothesized to be flexible, then the hypothesized subdivision into strict and flexible accomplishments is motivated.

If, however, there are categorical judgments of *true* for flexible accomplishment predicate sentences in the non-completed context, this indicates that there is not even the implicature of endpoint inclusion in these cases. Essentially, despite having the morphosyntactic form of what are traditionally thought of as accomplishments (i.e., [+ADD TO] and [+SQA]), these English predicates would in fact be activities in this case. Finally, if sentences featuring hypothesized flexible and strict accomplishments in non-completed contexts are both judged as false at similar rates, no partitioning of the class of accomplishments is motivated.

3.2.3 Results

In Table 1, below, the responses of participants to the survey English Experiment One are summarized.

Predicate	n (responses)		Response Breakdown		Randolph's Kappa		Distance from Completed to Non-Completed Kappa
	Completed or Default Condition	Non-Completed Condition	Completed or Default Condition	Non-Completed Condition	Completed or Default Condition	Non-Completed Condition	
SICK	9	--	T=7; NS=2	--	.417	--	--
STUDY	9	--	T=4; NS=4; F=1	--	.000001	--	--
SAD	8	--	T=5; NS=3	--	.196	--	--
WALK	8	--	T=8	--	1	--	--
SITTING	3	--	T=3	--	1	--	--
STANDING	14	--	T=14	--	1	--	--
TYPE	14	--	T=13; NS=1	--	.786	--	--
WIPE TABLE	3	--	T=3	--	1	--	--
DRAW PICTURE	9	8	T=9	T=7; NS=1	1	.625	.375
EAT SANDWICH	8	9	T=8	T=7; F=1; NS=1	1	.375	.625
WRITE STORY	9	8	T=7; NS=2	T=4; F=3; NS=1	.417	-0.018	.435
READ BOOK	9	8	T=7; F=1; NS=1	T=5; F=3	.375	.196	.179
MAKE BOX	8	9	T=8	F=9	1	1	2
FIX TV	8	9	T=6; NS=2	F=9	.357	1	1.357
SIT DOWN	11	5	T=11	F=4; T=1	1	.4	1.4
CATCH MOUSE	9	8	T=7; F=2	F=8	.417	1	1.417
BREAK CRACKER	6	11	T=6	F=11	1	1	2
FIND BOOK[8]	17	--	T=16; F=1	--	.824	--	--

Table 1: Responses and Randolph's Kappa scores for *English Experiment One* survey[9]

4. ANALYSIS

4.1 Effect Magnitude of Non-Completed Context

In considering research questions (5) and (6) above, it will be helpful to have a visual representation of the magnitude of the effect of the experimental condition, the

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[8] No non-completed version of FIND BOOK was shown to participants.

[9] Legend: *T* = response of *true*. *F* = response of *false*. *NS* = response of *not sure*.

presentation of the non-completed context, on participants' responses regarding items for which a completed/non-completed distinction is available. It is the predicates featured in these items which are at issue in this study; notionally atelic predicates have been included so as to establish a baseline for what kind of response should be expected in non-controversial cases. It is useful, for example, to compare the kappa scores for obviously true cases such as "Ray was standing," presented in the context of a scenario when he was portraying doing just this, with kappa scores for more controversial cases where judgments on standard tests vary.

For what predicates do English speakers consider endpoint inclusion crucial to the truth of statements featuring them? In the previous section, I calculated the distances between the kappa scores for the completed and non-completed contexts of presentation for each predicate. Below, in Figure 2, I place these distances on the non-negative segment of the number line whose minimum is 0 and whose maximum is 2, as the distances given in the previous section--the absolute values of the kappa for the completed context minus the kappa for the non-completed context--could range between these numbers.
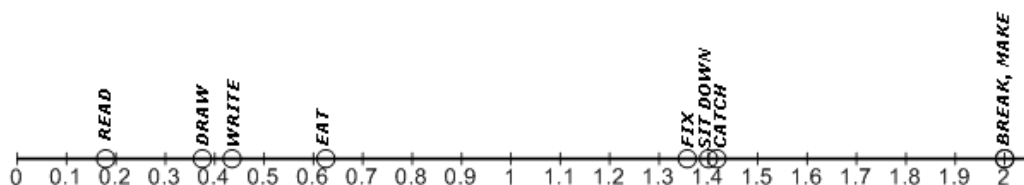
Figure 2: Magnitude of effect for presentation of items in non-completed context

Figure 2 arranges the predicates in increasing order of magnitude of effect of the experimental condition from left to right. That is, the farther an item lies to the right on the line, the greater the distance between the kappa score for the completed context and that for the non-completed context. Accordingly, the farther an item lies to the right on the line, the more strict respondents were about endpoint inclusion for that predicate. Thus, respondents were in substantial agreement in judging the non-completed context of "Ray read the book" as true in the non-completed context. The difference in agreement on a majority judgment of "true" between the completed and non-completed contexts was quite small at .196. For "Ray made a box," the kappa for the majority "true" judgment of the completed condition was 1 while the kappa for the majority "false" judgment for the non-completed condition was also 1, hence the distance between these kappas is the highest it could be, 2, showing a very strong effect for presentation of the non-completed context.

4.2 Problematic Items

Some surprising individual cases emerged which warrant some discussion. In any experimental study, weaknesses or inherent limitations in the design of certain items often only become apparent after the study has been run. Fortunately, it is often possible to glean much useful information even from these problematic items: sometimes they reveal issues for further exploration that were unthought-of prior to running the experiment. I believe this to be the case for the data in this study.

One issue which is apparent from looking at the results in Table 1 above is the low levels of agreement among raters for certain items. When we consider, for example, the class of predicates which do not admit of a completive/non-completive distinction, we can see that inter-rater agreement on three of these predicates was strikingly low: *sick*,

study, and *sad*. The Kappa scores for these three predicates was below .5. For *study* and *sad*, agreement was miniscule. Also interesting is the fact that, for predicates admitting of a completive/non-completive distinction, several items had lower than expected inter-rater agreement: *write story*, *read book*, *fix TV*, and *catch mouse*. For these last two items, agreement was, somewhat puzzlingly, higher for the non-completed than for the completed context. I believe that two main factors were at work with regard to these judgments. To some extent, these two factors may overlap.

One factor relates, I believe, directly to the nature of the design of the task and the nature of the judgments asked of the participants. Many of the questions are very easy to answer and, in the completed cases, have obvious answers of *true*. For example, if I show participants a video of a man catching a toy mouse being drawn along by a thread, and I ask them to say whether *Ray caught a mouse* is true or false, the catching part of the question is so obvious as to arouse suspicion as to whether something a bit more cognitively demanding is being asked about. This factor no doubt persists even in spite of instructions given at the beginning of the survey advising the participant that there are no trick questions, that things are as they seem, and that some questions may have very obvious, easy answers.

The solution for many participants to the over-ease of giving an obvious answer is to interpret the task as an exercise in critical thinking. Since the participants needed to know as little as possible about the actual research questions, in order to prevent their being biased or forming ad hoc ideologies to guide them in their answers, they are free to interpret the nature of the task in unanticipated ways, and, unavoidably, may begin to approach the judgment tasks with an unforeseen and undesirable degree of ontological rigor.

I believe this was the case when a few participants judged *Ray caught a mouse* in the completed context. What Ray actually caught was a *toy* mouse, not a real one. Something similar could have occurred to participants viewing the scenario depicting Ray looking sick, lying in bed with a cloth on his head, cold remedies on the nearby nightstand. Despite appearances--some raters might have thought--Ray might be faking illness.

A second factor in the lower levels of agreement for some predicates relates, I believe, more to the nature of the predicates and the types of events they describe, and I regard this factor as being of more theoretical relevance, as it does not involve a misinterpretation of the task, but a limitation of the ability of speakers of English to make judgments about real-life events which these predicates denote. In particular, some predicates denote events which are readily witnessed and which do not require much judgment about the intentions of agents, about the probable outcome of events, or of particular end results. Examples are *walking*, *sitting*, *standing*. We can visually witness these states of affairs by looking at the person performing them.

Other predicates, such as *fix TV*, often have visible manifestations which can be witnessed, but also components not amenable to observation, such as intention and causality. In particular, the fact that I see Ray tinkering with the TV is not enough for me to judge that he is trying to fix it. He may be removing parts for salvage. Further, even if Ray tinkers for a while with the TV, and then later it works, a person asserting that Ray fixed the TV has added to the observable fact of tinkering the judgment--more or less warranted as the case may be--that the tinkering was the cause of the TV's subsequent state of functioning. Often these are not difficult judgments to make, but they do set predicates like fix TV, write story, and even read book (for which an unobservable psychological component forms part of the truth conditions) from *walking*, *standing*,

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sitting, *draw picture*, *eat sandwich*. For the latter predicates, such psychological factors as intention are either irrelevant or impossible not to infer from direct observation. Much more will be said in a later section of this dissertation about the role such factors as the intentions of agents, causality, and inferences about probable outcomes may play in the denotations of predicates and the effects these may have on the interpretations in completed and non-completed contexts.

5. CONCLUSIONS

5.1 English Speakers' Intuitions and the Standard View

In this section I will address the first research question outlined above in (5), repeated below as (4):

(4)   Do native speakers' judgments on the truth vs. falsity of sentences match expected answers based on standard concepts of telicity in the lexical aspect literature? In particular, does the view that [+ADD TO] verbs with quantized arguments are telic find consistent support in the judgments of native speakers?

I believe that the results described above in Section 4 do not support the particular claim referenced in (4) that verb constellations involving dynamic verbs with quantized NP arguments are telic predicates in terms of their truth conditions. In the scenarios presented to participants in this study, completed events contrasted clearly with non-completed events and participants were asked for truth judgment on sentences featuring the dynamic verbs in the simple past tense with quantized NP theme/patient arguments, with the name "Ray," referring clearly to the actor in the scenarios, as the subject argument.

If (4) were true, notionally telic sentences presented in the non-completed context ought to have been uniformly judged false at a much higher rate, at least comparable to that found for achievements. As it was, only sentences featuring certain of the predicates

were so judged. For a sizeable class, as discussed above, much higher than expected rates of judgments of *true* were found, enough to make *true* the majority judgment in some of these cases. There is a clear contrast between this class of predicates and those which were judged as false in the non-completed context at a rate comparable to that for achievements.

5.2 English Speakers' Intuitions and Flexible vs. Strict Accomplishments

In this section I will address the second research question outlined above in (2), repeated below as (5)

(5)   Is a partition of the traditional class of accomplishments into flexible (those that permit non-endpoint inclusion) and strict (those that require endpoint inclusion) supported by the judgments of native speakers?

The division found in the data among notional accomplishment predicates, described above in Section 4 and Section 5.1, between those for which the non-completed context resulted in judgments of *false*, and those for which the majority response remained *true* in the non-completed context is suggestive of the possibility that there is such a partition in the class of accomplishments as is posited in (5). In the data set for the experiment described in this chapter, two predicates emerged as yielding quite unequivocal judgments among raters of false in the non-completed context: [*make a box*] and [*fix the TV*]. All of the other notional accomplishments yielded much less agreement, and in all cases in majority judgments of *true* in the non-completed contexts.

A larger data set which includes more accomplishment predicates for purposes of comparison with regard to (5) is a desideratum which is addressed in the next chapter. The experiment to be described in that chapter involved a much larger set of participants, and included only accomplishment predicates, some of which are hypothesized to be

flexible and some strict, with an aim to using experimental methods parallel to those described in this chapter.

Chapter 4: The Class of Accomplishments in English

1. OVERVIEW

The aim of the study described in this chapter is to expand on the findings outlined in Chapter Three, in which the intuitions of native English speakers were queried concerning predicates in all four of the traditional Vendler classes: states, activities, achievements, and accomplishments. The study which forms the basis for this chapter focuses solely on accomplishments. A problematic feature of accomplishments has received some attention in the literature (Hay, et al., 1999; Kratzer, 2002; Lin, 2004; Smollett, 2005; Gabriele, 2008): some apparent accomplishments do not seem to strictly require the event they denote to come to a given endpoint, but permit readings in which some progress was made toward the endpoint, but it was not reached.

2. RATIONALE AND RESEARCH QUESTIONS

The experiment described in this chapter is intended to address a phenomenon that becomes apparent in a consideration of the data which formed the basis for Chapter Three: the uniformity of true/false judgments for sentences featuring states, activities, and achievements and some accomplishments, but split judgments--or relatively strong agreement on judgments that were contrary to expectation--for certain other putative accomplishments. The event types chosen for English Experiment One described in Chapter Three were drawn from all four traditional Vendler classes. The experiment described here focuses only on accomplishments, and is designed to bring to bear the judgments of native English speakers on the following research questions.

(1)   Do native speakers' judgments on the truth vs. falsity of sentences match

expected answers given standard concepts of telicity in the lexical aspect literature? In particular, does the view that [+ADD TO] verbs with quantized arguments are telic find consistent support in the judgments of native speakers?

(2)   Is a partition of the traditional class of accomplishments into flexible (those that permit non-endpoint inclusion) and strict (those that require endpoint inclusion) supported by the judgments of native speakers?

(3)   What, if any, common conceptual features do members of the hypothesized classes of flexible and strict accomplishments share?

Questions (1)-(3) mirror questions (5)-(6) in Chapter 3. I seek further confirmation for the negative answer given to question (5) in that chapter and the affirmative answer given to question (6). Questions (1) and (2) will be answered in the course of this chapter. For question (3), some evidence will be adduced in this chapter to suggest a tentative answer, with further argumentation to follow in a later chapter.

3. METHODOLOGY

3.1 Participants

Seventy-eight adult native speakers of English participated in this study. This study, like the study described in the last chapter, was conducted entirely online. The participants were recruited as Amazon Mechanical Turk workers and completed the tasks associated with the experiment via their own web browsers remotely. Respondents were paid $1.00 U.S. for participating in the survey, regardless of whether their responses were ultimately included in the dataset. In order to restrict the pool of participants to native English speakers, certain measures were taken in designing the experiment and the parameters of the associated Mechanical Turk Human Intelligence Task (HIT). Workers were required to be U.S.-based. The announcement of the HIT specified that native English speakers were needed for the task. To log in to the website containing the survey, participants were asked three questions: (1) What is your native language? (2) Where

(what country) were you born? (3) Where (what country) did you grow up? No attempt was made to exclude non-native English speakers or nationals of non-English-speaking countries from participating in the survey, but the responses to these questions were recorded along with each participant's response set.

In addition, each participant was required to make an open-ended comment in a text box at the end of the experiment just prior to being taken to the debriefing script. This was to give me a way to judge the quality of the English of the respondent. A participant's response set was excluded from the dataset if he/she responded with a language other than English as a native language, if he/she was born and/or grew up in a non-English-speaking country, or if the response to the open-ended comment was missing or I judged it to seem non-native-like. One hundred respondents participated in the survey, out of which twenty-two response sets were excluded, leaving seventy-eight complete response sets from apparent native speakers.

In addition to serving as a way to judge the native-language status of a participant, the comment allowed me to judge how aware participants were of the nature of the experiment. I asked participants to comment on what they thought of the experiment and what they thought it was about. This information was helpful in determining how spontaneous the responses were likely to have been, and to what extent participants were able to form a conscious ideology about the linguistic issue under investigation.

3.2 Stimuli and Survey Instrument

The stimuli for this experiment were a set of written scenarios describing events that were performed to completion, with complementary events not performed to completion. This is in contrast to the mode of presentation for the stimuli in English Experiment One, in which video scenes were used. One of the problems with the use of

video scenes identified in the course of their use in English Experiment One is the problem that participants may have in being required to judge from mere appearances to make conclusions they may feel are unwarranted. The use of written scenarios was intended to provide participants with a kind of omniscient narrator who could supply information about the internal states, plans, intentions, etc., of the persons featured in the narratives, as well as supply information about future states of affairs that might influence a participant's opinion about endpoint inclusion.

There were twenty-two pairs of complementary (completed/non-completed) text scenarios, for a total of forty-four narrative paragraphs. The scenarios were distributed across two administration forms, Form A and Form B. If a completed version of a scenario appeared in Form A, it did not appear in Form B, so no participant read both the completed and non-completed versions of the same event. Within each administration form, the order of presentation of scenarios and, presentation of a true vs. false distracter question, and the position of the distracter before or after the research-related question were randomized.

During pilot runs of this experiment, it was found that respondents could often still guess the point of the study (completeness vs. incompleteness of events). For this reason, a second set of distracter stimuli and questions were added. This new stimuli included photos of hard-to-identify animals, plants, and parts of machinery. Made-up nonsense words were attached to these photos as they were introduced to participants. The presentation order of the photos and questions was not randomized, but they were added at intervals, always at the end of a set of questions following a scenario. An example of complementary completed/non-completed text scenarios is given in (15a-b) below.

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(4a) Completed scenario:

> *Erin didn't like any of the hats she saw in stores, so she bought some fabric and got to work. She cut out a pattern that she got from a craft book and began sewing the pieces together. After sewing the basic form, she added some flowers and some embroidery. She was pleased with the result, which fit her perfectly. She wore the hat to a dinner party, and no one realized it was home-made.*

(4b) Non-completed scenario:

> *Erin didn't like any of the hats she saw in stores, so she bought some fabric and got to work. She cut out a pattern that she got from a craft book and began sewing the pieces together. After sewing most of the basic form, she became a little confused. The remaining two pieces didn't seem to fit anywhere. Also, her hands had become sore from hand sewing. She gave up on using it as a hat, and instead put in on her nightstand where she used it to collect loose change.*

All of the events included in the scenarios were accomplishments based on standard assumptions in the literature and were ones that I believe conform to the conceptual criteria for accomplishments I outlined in Ch. 2, item (55).[10] A variety of accomplishment types were included: those featuring transitive verbs, such as [*eat a sandwich*] and [*drink a cup of coffee*]; those featuring intransitive verbs, such as [*the block of ice melt*] and [*the pan of water evaporate*]; predicates of creation, such as [*build a house*] and [*create a report*]; predicates of covering and removing covering, such as [*paint the barn*] and [*peel an orange*]. The predicates [*the block of ice melt*] and [*the pan of water evaporate*] are also degree achievements and thus of interest in view of the attention these predicates have received in the literature. The complete text of all scenarios, prompt sentences, and their order of presentation in the forms can be found in Appendix C.

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[10] I repeat these criteria here: a. Bare accomplishment clauses denote time-extended events by default.
b. Bare accomplishment clauses have a salient natural endpoint.

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4. RESULTS

4.1 Results

In Table 2, below, the responses of participants to the survey *English Lexical Aspect and Event Structure* are summarized

Predicate	*n* (responses)		Response Breakdown		Randolph's Kappa		Distance from Completed to Non-Completed Kappa
	Completed Condition	Non-Completed Condition	Completed Condition	Non-Completed Condition	Completed Condition	Non-Completed Condition	
SEW A DRESS	38	40	T=38	T=23; F=16; NS=1	1	0.217	.783
PEEL AN ORANGE	39	38	T=39	T=36; F= 2	1	0.846	.154
PAN OF WATER EVAPORATE	38	39	T=34; NS=4	T=35; F=2; NS=2	0.710	0.709	.001
BLOCK OF ICE MELT	40	38	T=40	T=36; F=2	1	0.846	.154
WRITE A STORY	38	40	T=38	T=33; F=6; NS=1	1	0.544	.456
PAINT THE BARN	40	38	T=40	T=32; F=5; NS=1	1	0.580	.420
KNIT A BLANKET	38	40	T=35; F=2; NS=1	T=22; F=17; NS=1	0.772	0.206	.566
EAT A SANDWICH	39	38	T=39	T=36; F=2	1	0.846	.154
DRINK A CUP OF COFFEE	38	40	T=37; F=1	T=32; F=8	0.921	0.508	.413

Table 2: Responses and Randolph's Kappa scores for *English Experiment Two*[11]

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[11] Legend: *T = true. F = false. NS = not sure.*

READ [*title of book*]	40	38	T=40	T=20; F=16; NS=2	1	0.164	.836
BUILD A HOUSE	38	40	T=38	T=20; F=18; NS=2	1	0.162	.838
FIX THE RADIO	40	38	T=37; F=2; NS=1	T=1; F=37	0.783	0.921	1.704
SOLVE THE PROBLEM	38	40	T=34; F=3; NS=1	T=2; F=34; NS=4	0.703	0.592	1.295
CREATE A REPORT	40	38	T=39; F=1	T=16; F=21; NS=1	0.925	0.204	1.129
CONVINCE [*someone to do x*]	38	40	T=35; F=2; NS=1	F=25; NS=15	0.772	0.279	1.051
DEVISE A PLAN	40	38	T=39; NS=1	T=23; F=13; NS=2	0.925	0.208	.717
ASSEMBLE A TELESCOPE	38	40	T=38	T=11; F=27; NS=2	1	0.283	1.283
INSTALL THE PROGRAM	40	37	T=38; F=1; NS=1	T=6; F=31	0.852	0.581	1.433
MAKE A HAT	38	40	T=37; F=1	T=7; F=27; NS=6	0.921	0.244	1.165
ESTABLISH A BUSINESS	40	38	T=40	T=27; F=10; NS=1	1	0.345	.655
ORGANIZE A TRIP	38	40	T=38	T=32; F=6; NS=2	1	0.485	.515
CUP OF WATER FREEZE	40	38	T=40	T=31; F=5; NS=2	1	0.516	.484

Table 2, cont.

Table 2 shows, for each item presented in the completed and non-completed context, the number of responses followed by a breakdown of the responses in terms of how many participants answered "true," "false," or "not sure." Next, Randolph's Kappa scores are given for each item, and finally, as in Table 1 in Chapter 3, a 'distance' is given between the kappa score for the completed and the kappa score for the non-completed version of each item. As in the last chapter, this distance was computed by changing the sign of the kappa to negative if the majority response for a given item was "false"; otherwise, the kappa was left positive. The kappa for the item in the non-completed context was then subtracted from that of the kappa in the completed context. In this way, majority-true response sets with a high kappa score lie far to the right of zero on a number line while majority-false response sets with a high kappa score lie far to the left.

5. ANALYSIS

5.1 Effect Magnitude of Non-Completed Context

In considering research questions (12) and (13) above, it will be helpful to have the same kind of visual representation as was given in Chapter 3 for the magnitude of the effect of the experimental condition, context manipulation, on participants' responses. For what predicates do English speakers consider endpoint inclusion crucial to the truth of statements featuring them? In the previous section, I calculated the distances between the kappa scores for the completed and non-completed contexts of presentation for each predicate. Below, in Figure 3, which is the counterpart to Figure 2 in Chapter 3, I place these distances on the non-negative segment of the number line whose minimum is 0 and whose maximum is 2, as the distances given in the pFigure 3revious section--the absolute values of the kappa for the completed context minus the kappa for the non-completed context--could range between these numbers.
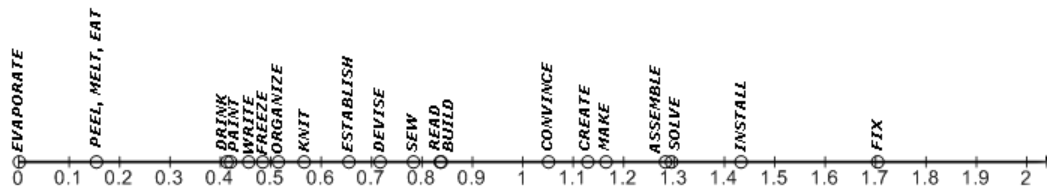
Figure 3: Magnitude of effect for presentation of items in non-completed context

Figure 3 arranges the predicates in increasing order of magnitude of effect of the experimental condition from left to right. That is, the farther an item lies to the right on the line, the greater the distance between the kappa score for the completed context and that for the non-completed context. Accordingly, the farther an item lies to the right on the line, the more strict respondents were about endpoint inclusion for that predicate. Thus, respondents were in near unanimity in how they judged *The pan of water evaporated* in the non-completed context. The difference in agreement on a majority judgment of "true" between the completed and non-completed contexts was miniscule at .001. In contrast, for "Natalie fixed a radio," the kappa for the majority "true" judgment of the completed condition was 0.783, whereas the kappa for the majority "false" judgment for the non-completed condition was even higher, at 0.921. The distances between these kappas is great, 1.704, showing a strong effect for presentation of the non-completed context.

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6. CONCLUSIONS

6.1 English Speakers' Intuitions and the Standard View

In this section I address the first research question outlined above in (1), repeated below as (5):

(5)   Do native speakers' judgments on the truth vs. falsity of sentences match expected answers based on standard concepts of telicity in the lexical aspect literature? In particular, does the view that [+ADD TO] verbs with quantized arguments are telic find consistent support in the judgments of native speakers?

Consulting Table 2 above, it is easy to find several counter-examples to an affirmative answer to (5). Predicates such as [*peel an orange*], [*eat a sandwich*], [*paint the barn*], [*drink a cup of coffee*] have [+ADD TO] verbs with quantized arguments, yet sentences with these predicates presented in non-completed contexts were judged overwhelmingly as "true," contrary to what would be expected if the answer to (5) were affirmative. These considerations suggest that authors such as Kennedy, et al. (1996), Kratzer (2002), are correct in doubting, and Lin (2004), and Smollett (2005) are correct in denying, that [+ADD TO] verbs with quantized arguments are inherently telic. At least a sub-class of these predicates permit non-endpoint-inclusive readings.

6.2 English Speakers' Intuitions and Flexible vs. Strict Accomplishments

In this section I address the first research question outlined above in (2), repeated as (6) below.

(6)   Is a partition of the traditional class of accomplishments into flexible (those that permit non-endpoint inclusion) and strict (those that require endpoint inclusion) supported by the judgments of native speakers?

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One possibility for identifying a basic split in the class of predicates under consideration for this experiment is evident in terms of which predicates show what I will call a "true-to-false shift." By this I refer to the subset of predicates for which the majority judgment for the item presented in the completed context was "true," whereas the majority judgment for the item presented in the non-completed was "false." Table 3, below, outlines which predicates did and did not undergo this shift.

True-to-false shift	*fix the radio* *install the program* *solve the problem* *assemble a telescope* *make a hat* *create a report* *convince (someone to do something)*
No true-to-false shift	*sew a dress* *peel an orange* *(pan of water) evaporate*[12] *(block of ice) melt* *write a story* *paint the barn* *knit a blanket* *eat a sandwich* *drink a cup of coffee* *read [title of book]* *build a house* *devise a plan* *establish a business* *organize a trip* *cup of water freeze*

Table 3: Predicates categorized as to true-to-false shift

[12] The verb-argument order in [*(pan of water) evaporate*] and [*(block of ice) melt*] is different from the other items in this table because only these two were presented as intransitive verbs: *The pan of water evaporated. The block of ice melted.*

Clearly, for the predicates undergoing a true-to-false shift, some did so more dramatically than others; likewise, for those with no true-to-false shift, the difference in agreement on a majority "true" answer for the completed and non-completed context was quite large in some cases. However, consulting Fig. 3 above, a sizeable gap of 0.221 can be seen between the rightmost member of the true-to-false shift group, [*build a house*], and the leftmost member of the non-true-to-false shift group, [*convince (someone to do something)*]. I will consider this large gap in the middle of Figure 3 to correspond to a basic split between accomplishment predicates that require endpoint inclusion and those which do not.

Chapter 5: Telicity and Lexical Aspectual Classification in American Sign Language

1. BACKGROUND

1.1 *American Sign Language Aspectual Classes*

The experiment described in this chapter, *American Sign Language Aspectual Classes* (henceforth: *the ASL Experiment*) is the ASL counterpart of the experiment reported in Chapter 3 for English. This experiment used the same video clips designed for *English Aspectual Classes*, but with sentences presented in video format, signed in ASL by a native signer, for participants to judge as true or false. The aim of this study is to query the judgments made by native signers concerning sentences which convey—on standard criteria—events belonging to the four traditional Vendler (1957) verbal categories with respect to lexical aspect: states, activities, accomplishments, and achievements, with a special emphasis on accomplishment predicates.

The problems in approaching this topic for ASL are of a slightly different nature than those for English. It is not always easy--or even possible--to diagnose the telicity of predicates in ASL with some of the standard tests used for English. It is not clear that the *in+time expression* and *for+time expression* tests are available for ASL, for example. Moreover, some common ASL/English translation equivalents and glosses may be highly misleading as to the telicity of a predicate. Also, it is regarded as an open question whether ASL has four clear Vendlerian classes of predicate. As will be seen, there are grounds for questioning whether ASL has an independent lexical class of

accomplishment predicates.[13] It does not, at any rate, seem to have a well-populated one. The study described in this chapter aims to use psycholinguistic survey data to clarify some of these challenges in analyzing ASL lexical aspect.

2. ASPECT, TELICITY, AND AMERICAN SIGN LANGUAGE

2.1 Aspect in American Sign Language

Prefatory to giving an account of the phenomena described in this chapter, I provide a brief overview of the system of tense and aspect in ASL so that the possible interactions between verbal lexical aspect and the other resources in ASL for conveying event time and completion--both morphological and lexical--can be efficiently described.

2.1.2 Temporal Location

ASL is a tenseless language in the sense of Smith (1991). That is, ASL lacks bound morphology that explicitly connects event time to utterance time (Rathmann, 2005). ASL is often described as relying heavily on context for clues about temporal location. Temporal adverbials, such as YESTERDAY, NOW, TOMORROW, FUTURE, etc., often signal event time for a clause and, unless there is a need for a change in temporal location, such an adverbial may set the temporal context for an entire discourse.

Like many tenseless languages, ASL uses perfective aspect to convey information about temporal location: perfective-marked sentences are past-located by default (Rathmann, 2005); that is, lacking any sentence-level or contextually-established cues to

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[13] I do not have first-hand knowledge of any other languages for which this claim is plausible, however it would not be surprising to find that there are languages which lack an independent lexical category for accomplishments and rely on periphrastic constructions to represent accomplishment events, as ASL seems to do. I argue in Chapters 2 and 6 that accomplishments are more semantically complex than other aspectual types by virtue of their encoding of both the concepts of a preparatory phase and of an endpoint, while the other three Vendler types encode only one or the other. Hence, it would not be surprising if some languages would not tend to package preparatory phases and endpoints together in one lexeme.

temporal location, a perfective sentence--such as one marked by FINISH--is interpreted as having an event time in the past. Non-aspectually-marked sentences with state predicates (eg., SICK, HAPPY) are interpreted as present located by default, while those with activity, achievement, and accomplishment predicates seem to be temporally indeterminate (Wright, 2010).

2.1.3 Bound Morphology for Aspect

ASL has a notoriously rich system of bound morphology to convey aspect which depends upon characteristic movement contours. Various modulations of the movement of verbs, including circular-path movement and reduplication, may convey durative, punctual, repeated, habitual, etc., readings of these verbs (Klima & Bellugi, 1979; Anderson, 1982). As this study aims to specify the truth conditions of the base forms of verbs, it will have little to say about these features of ASL morphology. The sentences presented to participants were all of the simple, non-aspectually-marked type. The sign model for the videos was asked to avoid any type of reduplication or movement modulation in forming the sentences so that a durative/progressive reading would not be coerced.

2.1.4 Lexical Result-State Markers[14]

Of special interest to this study is a class of signs which seem to function as result-state markers for verbs that are not inherently telic. Like FINISH, which is a

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[14] The ASL examples given here and subsequently follow glossing principles widely used in the ASL linguistics literature (Baker-Schenk & Cokely, 1980). Individual lexical signs are represented by an English word in all caps. Words joined by a dash, such as DRINK-ALCOHOL represent a single sign which needs more than one English word to convey some of the meaning of the sign. Overbars with script notations, such as _____ *t* over a string of words indicates an intonational phrase, represented by non-manual head, eyebrow, body movements that are synchronized with that string of signs. In (1) and (2) above, this overbar represents a Topic phrase; topicalized information is assumed to be already established in the discourse context.

general-purpose perfective marker, these particles may occur in clause-final position. Unlike FINISH, they do not occur in the pre-verbal position, although some may take the place of full lexical verbs. Also unlike FINISH, a given result-state particle often co-occurs with a restricted range of verbs. An excellent example of such a particle is one I will gloss as DRAIN, which occurs with verbs such as DRINK and DRINK-ALCOHOL.

            _____t
(1)   WATER, I DRINK.
        I drink/drank/will drink (the) water.

            _____t
(2)   WATER, I DRINK DRAIN.
        I drank all the water (e.g., in the glass).

(3)   I DRINK-ALCOHOL BEER 3, DRAIN, DRAIN, DRAIN.
        I slammed down three beers in a row.

DRAIN is iconic with respect to the level of fluid in a container, and shows the level of liquid rapidly descend to the bottom of a container.[15] It is shown in Figure 4 below.

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[15] A similar sign is described by Valli (2005:xxxix) as representing deflation of an inflatable object, such as a tire. DRAIN seems to be executed manually in exactly the same way, but most likely the use of the sign described by Valli (to which he does not give a gloss) is accompanied by cheek-puffing non-manual marker. Valli describes this sign as an *extent handshape* classifier.

Figure 4: *DRAIN*

Note the contrast in meaning between (1) and (2) above. The simple, non-aspectually-marked form of DRINK in (1), without an endpoint particle, conveys drinking without necessarily exhausting a given quantity of water. The presence of DRAIN in (2) forces a telic reading. The given quantity of water was completely drunk. Item (2) is perfectively marked, while item (1) is not aspectually marked. By default, (2) is past-located while (1) has no default temporal reading. Either (1) or (2) may be interpreted as past, present, or future-located, however, in contexts with an established reference time. Two semantically-similar result-state particles are RUN-OUT, in the sense of exhausting a quantity of food or other material, used in conjunction with verbs of

consumption such as EAT, and a particle I will gloss as NOT-A-TRACE, which denotes a total absence of a substance, such as hair after complete shaving or cleaning a surface to absolute spotlessness.[16] RUN-OUT and NOT-A-TRACE are shown in Figure 5 and Figure 6 below.

Figure 5: *RUN-OUT*

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[16] Tennant & Gluszak Brown (1998) gloss this sign as BARE, BALD, BLANK, EMPTY, NAKED, NUDE, VACANT, VOID.
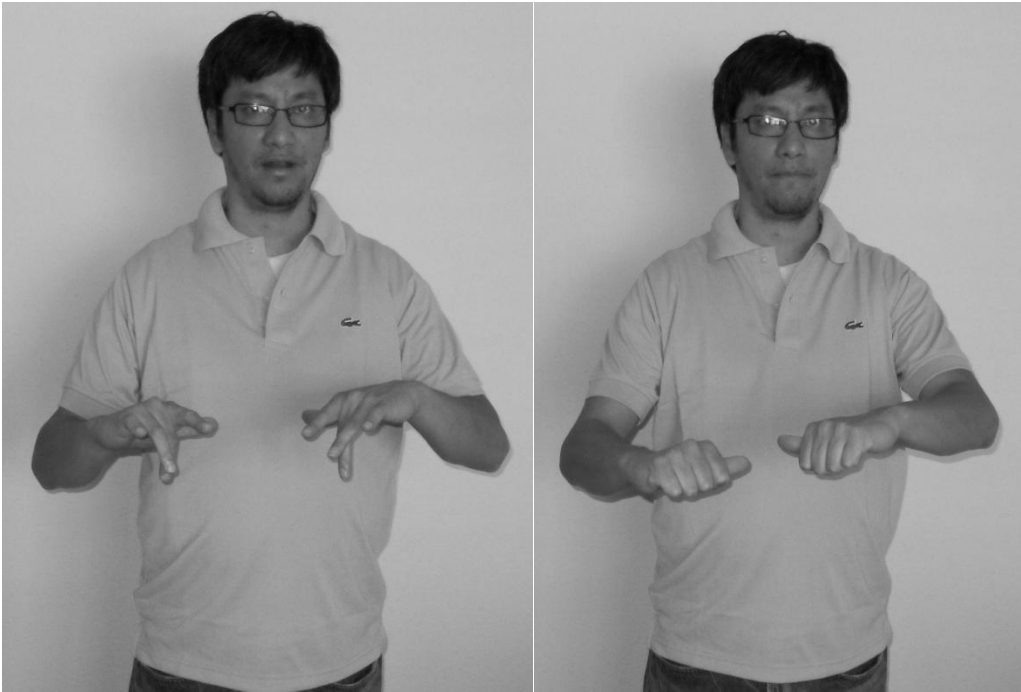
Figure 6: *NOT-A-TRACE*

These end-state markers have not been much discussed even in the pedagogical literature on ASL. Valli (2005) refers to DRAIN as an *extent handshape* classifier. These three end-state markers show different syntactic characteristics. DRAIN and RUN-OUT are alike in that they can both be the main verb in a clause. DRAIN, however, can also occur post-verbally with verbs like DRINK, as in (2) above. In (6b'), below, it is not entirely clear whether RUN-OUT is a post verbal particle, as DRAIN clearly is in (2), or if it takes BOX DONUTS as an implied subject. NOT-A-TRACE cannot be the main verb in a clause, or take a subject at all. Hence, the three verbs/light verbs/post-verbal particles are really not much alike syntactically. Much more research is needed into their syntactic properties and their status with respect to the main verbs of clauses.

These end-state markers seem to occur in ASL in contexts where an end-state is strongly implied in English. Hence, (1) above seems insufficient in ASL to convey the

implied end-state that obtains upon event realization represented by the English sentence (4) below:

(4)   I drank the water.

In a context in which the water is understood to be a given, delimited quantity of water, (4) implies that all the water was drunk. Note the contrasting examples below.

(5)   a. John shaved his head.
        b. Mary ate the box of donuts.

(6)   a. JOHN SHAVE-HEAD.
           John shaved his head.

        a'. JOHN SHAVE-HEAD, NOT-A-TRACE$_{(on\ head)}$[17].
            John shaved his head completely bald.

        b. BOX DONUTS, MARY EAT.
           Mary ate (from?) the box of donuts.

        b'. BOX DONUTS, MARY EAT++, RUN-OUT.
            Mary ate the whole box of donuts.

Both of the English examples in (5) at least imply endpoint inclusion. It is standard to assume that shaving one's head implies shaving it to baldness. An English speaker would normally specify lesser degrees of completeness of shaving if these were meant. Likewise, *eat a box of donuts* as in (9b) at least strongly implies eating all the donuts in the box. These are standard examples of [+ADD TO] verbs with [+SQA] NPs, with no further elaboration from endpoint-denoting adverbials such as *completely*, or quantifiers such as *all*.

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[17] The notation (on head) indicates that this particle can specify location. In this case, it is swiped around the top of the head to indicate an absence of something--in this case, hair. This same classifier can be used along the length of the body with two hands to form the sign NAKED, or with two hands across a horizontal plane in front of the signer's body to form the sign DESOLATE, as in a landscape.

As seen in the translations for the ASL examples in (6), it is not the case that these examples in ASL (corresponding to the English examples in (5)) imply endpoint inclusion. Without explicit endpoint marking in the form of end-state particles such as NOT-A-TRACE and RUN-OUT, endpoint inclusion is not even implied. In the case of (6a), for example, the reaching of the end-state of complete baldness is highly in question, and not at all implied. When presented with this sentence, an interlocutor might well inquire "NOT-A-TRACE_(on head)?" This apparent lack of an endpoint-inclusion implicature for +ADD/+SQA verb constellations in ASL will be the focus of further attention in Chapter 6 of this dissertation.

2.2 Telicity Research in American Sign Language

Much prior research—most, in fact—bearing on telicity in ASL has focused on a highly interesting issue: the putative phonological markers of endpoints in lexical items. In particular, Wilbur (2003), Malaia, Borneman & Wilbur (2008), and Malaia & Wilbur (2011) have posited a set of "kinematic signatures" which overtly convey endpoint inclusion of ASL predicates. This set of movement characteristics includes change of aperture of handshape (closed to open, or vice-versa), e.g., THROW; change of palm orientation, e.g., DIE; change in position of the handshape from one location to another, e.g., POSTPONE; movement to a hold ("abrupt stop to point or location in space"), e.g., COME-HERE; and movement to (dominant handshape to non-dominant handshape or handshape to body) contact, e.g., HIT (Wilbur, 2003). These signs are shown below in Figures 7 - 11. The existence of a set of overt telicity morphemes (as Wilbur seems to imply these are) raises issues for any study involving aspectuality in ASL, which I will discuss briefly in this section.

Figure 7: *THROW*

Figure 8: *DIE*
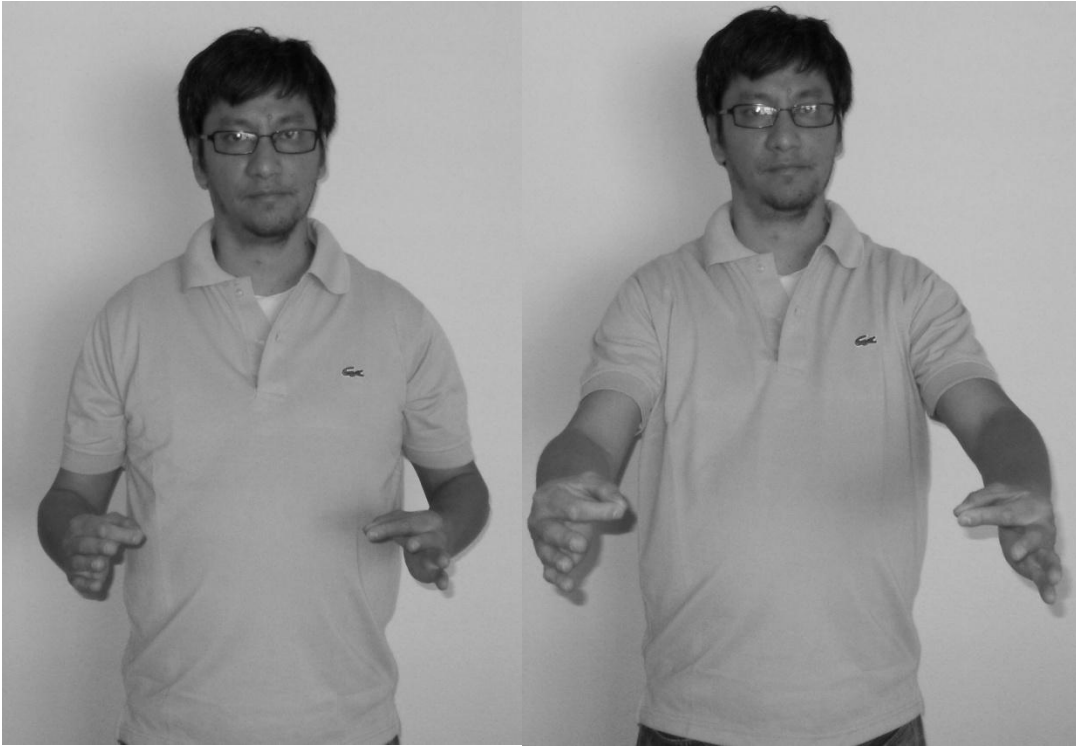
Figure 9: *POSTPONE*
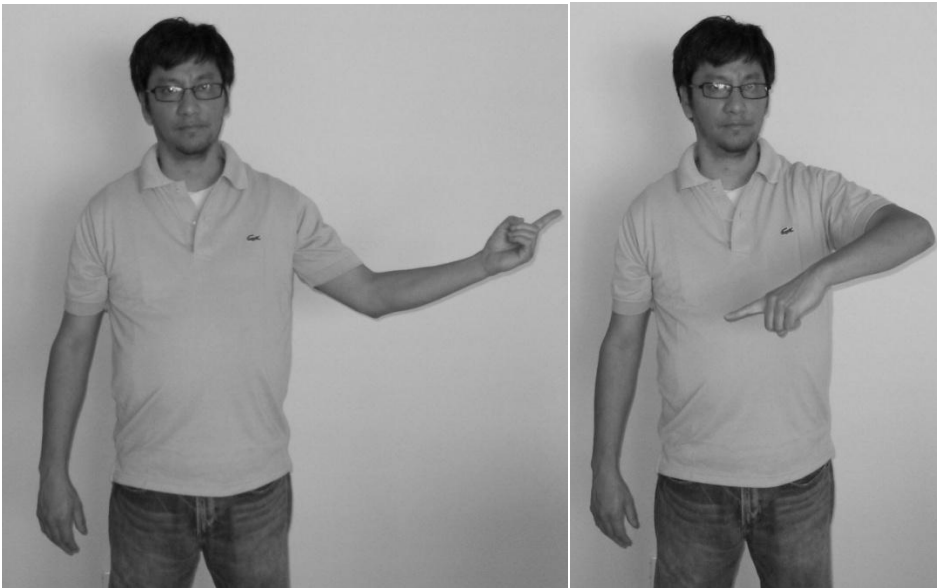
Figure 10: *COME-HERE*
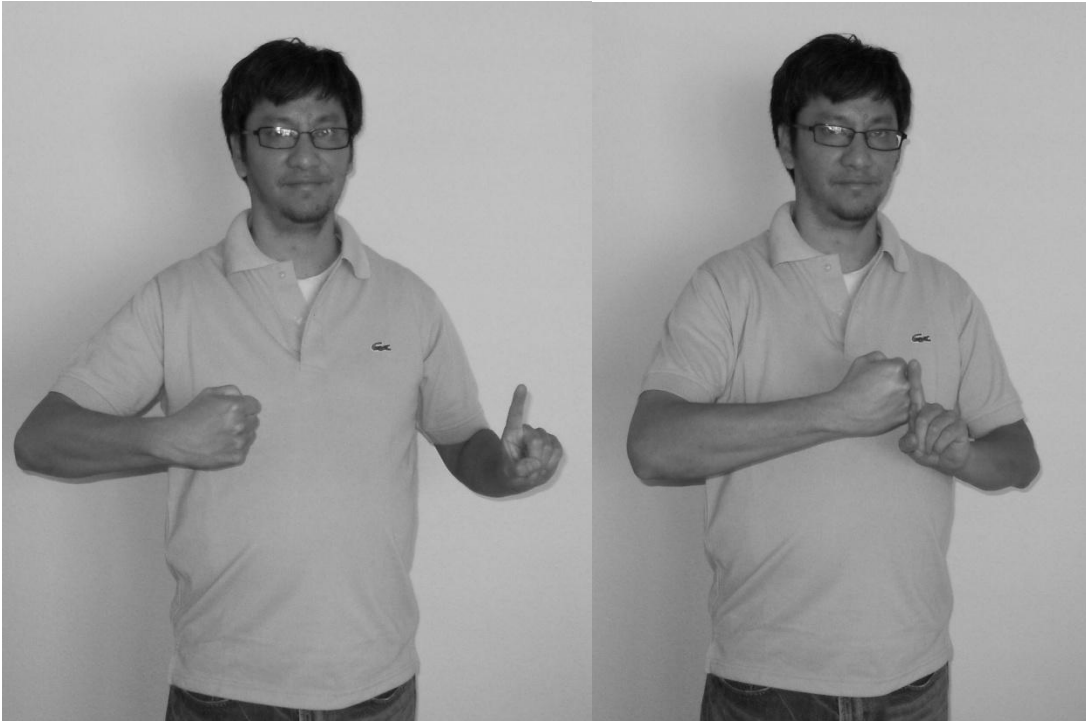
Figure 11: *HIT*

One consequence of the conclusions reached in Wilbur (2003), Malaia, Borneman & Wilbur (2008) and Wilbur & Malaia (2011) is that endpoint inclusion in ASL is overtly marked by a bound morpheme. These "kinematic signatures" are referred to by Wilbur et al. as being "morphophonological" in nature or as "morphophonemes" at various points in their publications (Wilbur, 2003, Malaia, Borneman & Wilbur, 2008; Malaia and Wilbur, 2011). I interpret these references as implying that these movement characteristics are phonologically-overt bound morphemes.

If this is true, it would constitute a stark contrast with English, for which telicity is believed to be a "covert category" in the terminology of Smith (1991); that is, telicity in English is not overtly marked in the verbal morphology, but is conveyed at the clause level by various mechanisms such as prepositions (*eat up*, *cut through*) or adverbial

constructions (*completely*, *thoroughly*), or at the lexical level, but as a part of the truth conditions of the root (e.g., *arrive*, *swallow*, *convince*, *drain*), not via separate affixes.

Malaia, Borneman & Wilbur's (2008) Event Visibility Hypothesis (EVH) posits an overt phonological reflex for every component of event structure in the predicates of signed languages. In the case of endpoints, then, this element of event structure should be visible in the movement characteristics of telic verbs. Whether the relation between kinematic signatures and elements of event structure is one-to-one is not clear: there may be cases in which a movement characteristic that is a kinematic signature of a given event structure element does double-duty in the language, i.e., it is ambiguous and may also convey other semantic information in other contexts. Such may be the case with large path movements followed by abrupt hold or contact. The final hold or contact could be argued to convey intonational prominence rather than endpoint inclusion, for example, in stative verbs such as HAVE, or are simply a part of the phonological specification of certain stative verbs, such as OWN. Nonetheless, we would still expect to see--given the EVH--that endpoints are phonologically overt wherever they are part of verb meaning.

If the EVH is correct, in the context of the experiment described in this chapter, the predicates in sentences which subjects judged as "false" in non-completed contexts should show the movement signatures described in Wilbur, Borneman, and Malaia's findings. Despite the fact that no systematic attempt has been made to measure the movements of signers in the videos presented to participants for this experiment, as was done in Wilbur & Malaia (2011), it is in many cases quite clear when there are signs which feature displacement from one location to another, or a change in handshape aperture, and these factors may form a basis for comparison between Wilbur & Malaia's findings, based on movement characteristics, and my own, based on psycholinguistic survey data.

3. RESEARCH QUESTIONS

(7)   Do native signers' judgments on the truth vs. falsity of sentences match
        expected answers based on standard concepts of telicity in the lexical aspect
        literature? In particular, does the view that [+ADD TO] verbs with quantized
        arguments are telic find consistent support in the judgments of native signers?

(8)   Is a partition of the traditional class of accomplishments into flexible (those that
        permit non-endpoint inclusion) and strict (those that require endpoint inclusion)
        supported by the judgments of native signers?

In addition to these research questions, a practical goal of the present study is to develop

a cross-linguistically valid experimental means of diagnosing the telicity of predicates.

4. METHODOLOGY

Twelve native Deaf adult signers of ASL participated in the survey which forms

the basis for this study. All twelve of these individuals grew up signing ASL in a home

with at least one Deaf parent. Participants took part in the survey using their own

computers via the internet using a website designed by the researcher.

Participants viewed a series of sixteen wordless video scenarios in which an actor

was shown performing various actions. These video scenes were chosen from the same

set of video clips as those used in the experiment for English (*English Aspectual Classes*)

described in Chapter 3. Each scene contained the same male actor, referred to in the

questions as "Ray." Although the scenes were filmed on the same day, care was taken to

have the actor change clothes in different scenes so as to avoid the viewer construing the

scenes as forming a single narrative. The actor did not speak or sign at all during any of

the scenes. To prevent boredom on the part of participants, parts of some scenes were later edited to speed them up.

Each participant viewed 16 out of a total of 26 possible scenes. Participants took one of two administration forms, each of which contained three states, three activities, three completed accomplishments, three uncompleted accomplishments, two completed achievements, and two uncompleted achievements. The scenes were distributed across the administration forms so that no participant viewed both the completed and uncompleted versions of the same scene.

The order of presentation of scenes within each form was randomized. Each administration form also contained a number of distracter questions which did not pertain to the issue of event completeness in order to minimize the possibility of participants' consciously considering this issue in answering questions. The order of presentation of distracter questions within each form for which a positive vs. negative answer was anticipated was also randomized. See the Appendix for a full listing of video scenes, their lexical aspect category (based on standard assumptions in the literature) and the question corresponding to each scene.

Before taking part in the survey, participants viewed the text of the informed consent document signed in ASL by "Jilly," a skilled Deaf signer. "Jilly" also gave instructions on how to participate and answer questions in the survey. After the survey was completed, each participant viewed a video of "Jilly" signing the de-briefing text, which explained the true purpose of the survey and which questions had been research questions and which distracters.

After participants viewed each of the sixteen scenes, a video was presented to them of a sentence in ASL, signed by "Debbie," a native Deaf signer whose parents were both Deaf. For example, in one scenario, participants viewed a video of "Ray" eating

about half of a sandwich and throwing the rest of it away in a trash can (so as to emphasize that the scenario was over, and to discourage the idea that "Ray" would later resume eating the sandwich). The participant then viewed a video of "Debbie" signing the following declarative sentence in ASL:

(9)   #RAY, EAT SANDWICH.

After the very first scenario which participants viewed, a video of "Jilly" signing in ASL prompted the participants to click on the "True" button if they thought the sentence they had just seen "Debbie" sign was true, to click on the "False" button if they thought the sentence was false, and to click on "Not sure" if they were not sure whether the sentence was true or false. After the first scenario, no video of "Jilly" appeared to further prompt respondents, but the choice of the three "True," "False," and "Not sure" buttons remained the same. Participants' responses were recorded automatically in a MySQL database.

5. RESULTS

5.1 Overview

A complete breakdown of the participants' responses is found in the Appendix. As with the English experiment described in Chapter 3, informants overwhelmingly judged sentences corresponding to state and activity video scenes as true, as expected. In these video scenes, the actor performed several mundane actions, such as walking or typing on a laptop, or was seen to be in some state such as sitting or standing. Subjects also overwhelmingly judged sentences corresponding to completed Achievement scenes as true, and those corresponding to uncompleted achievement scenes as false, also as expected. These scenes included intuitively obvious achievements as catching a toy mouse, breaking a cracker in two, or sitting down from a standing position. Although the answers to the questions concerning these achievement items and the state and activity

items seem so obvious as not to require explicit experimental investigation, these items nonetheless serve as control conditions for purposes of comparison with more controversial or problematic cases. They also serve as a metric for inter-rater consistency.

While sentences corresponding to completed Accomplishment scenes were overwhelmingly judged as true, again completely in accordance with standard expectations, sentences corresponding to certain uncompleted Accomplishments were also judged as true at a surprisingly high rate, and at a higher rate than found for English in the experiment described in Chapter 3.

5.2 Statistical Analysis

5.2.1 Inter-Rater Reliability

The issues of inter-rater reliability pertaining to this experiment are essentially identical to those dealt with in Chapter 3 for *English Aspectual Classes*. For this experiment I have again chosen as a measure of agreement among participants the free-marginal multi-rater Randolph's Kappa (Randolph, 2005), described in that chapter. As outlined there, when there is a low Kappa for a given item, this indicates that there was not a clear majority judgment on the part of reliable raters, while a high Kappa indicates acceptable agreement among raters. In the context of a linguistic study, high agreement among raters may be regarded as evidence for shared linguistic knowledge as regards a particular item. A lack of agreement may indicate a lack of shared knowledge, or variability among respondents regarding the locus of their attention on matters of truth, matters of felicity, or on other issues. Problematic cases--those in which it is suspected that matters other than truth/falsity or felicity guided participants' responses--will be dealt with in the sections that follow.

5.2.3 Results

In Table 4, below, the responses of participants to the survey *ASL Aspectual Classes* (*the ASL Experiment*) are summarized.

Predicate	*n* (reponses)		Response Breakdown		Randolph's Kappa		Distance from Completed to Non-Completed Kappa
	Completed or Default Condition	Non-Completed Condition	Completed or Default Condition	Non-Completed Condition	Completed or Default Condition	Non-Completed Condition	
SICK	11	--	T=11	--	1	--	
WALK	11	--	T=11	--	1	--	
RUN	12	--	T=12	--	1	--	
SITTING	12	--	T=12	--	1	--	
STANDING	11	--	T=11	--	1	--	
TYPING	11	--	T=8, NS=2, F=1	--	.291	--	
REPAIR TV[18]	6	6	T=6	T=6	1	1	0
DRAW PICTURE	5	6	T=5	T=6	1	1	0
EAT SANDWICH	6	5	T=6	F=3, T=2	1	.1	1.1
WRITE STORY	6	6	F=4, T=2	T=5, F=1	.2	.5	0.7
READ BOOK	5	6	T=5	T=5, F=1	1	.5	.5
MAKE BOX	6	6	T=4, F=2	F=6	.2	1	1.2
SIT DOWN	6	5	T=5, F=1	F=5	.5	1	1.5
CATCH MOUSE	6	6	T=5, F=1	F=5, T=1	.5	.5	1
BREAK CRACKER	6	6	T=6	F=6	1	1	2
FIND BOOK	6	5	T=6	F=5	1	1	2

Table 4: Responses and Randolph's Kappa scores for the ASL Experiment[19]

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[18] See section 5.2 below for an explanation of the verb REPAIR and this apparently surprising result.
[19] Legend: *T* = response of *true*. *F* = response of *false*. *NS* = response of *not sure*.

6. ANALYSIS

6.1 Effect Magnitude of Non-Completed Context

In considering research questions (7) and (8) above, it will be helpful to have the same kind of visual representation as was given in Chapters 3 and 4 for the magnitude of the effect of the experimental condition, the presentation of the non-completed context, on participants' responses. For which predicates do native ASL signers consider endpoint inclusion crucial to the truth of statements featuring them? In the previous section, I calculated the distances between the kappa scores for the completed and non-completed contexts of presentation for each predicate. Below, in Figure 12, which is the counterpart for this experiment of Figure 2 in Chapter 3, and Figure 3 in Chapter 4, I place these distances on the non-negative segment of the number line whose minimum is 0 and whose maximum is 2, as the distances given in the previous section--the absolute values of the kappa for the completed context minus the kappa for the non-completed context--could range between these numbers.
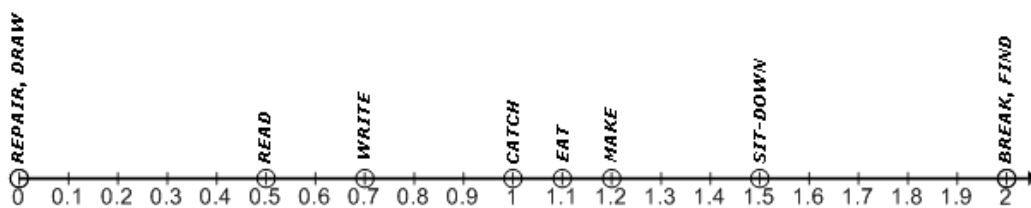
Figure 12: Magnitude of effect for presentation of items in non-completed context

Figure 12 arranges the predicates in increasing order of magnitude of effect of the experimental condition from left to right. That is, the farther an item lies to the right on the line, the greater the distance between the kappa score for the completed context and that for the non-completed context. Accordingly, the farther an item lies to the right on the line, the more strict respondents were about endpoint inclusion for that predicate. Thus, respondents were unanimous in judging both the completed and non-completed contexts of "TV, RAY REPAIR" as true. Hence, the difference in agreement on a majority judgment of "true" between the completed and non-completed contexts was 0, while for "CRACKER, RAY BREAK," the kappa for the majority "true" judgment of the completed condition was 1, while the kappa for the majority "false" judgment for the non-completed condition was also 1, hence the distances between these kappas is as high as it could be, 2, showing a very strong effect for presentation of the non-completed context. For consistency, I have placed WRITE on this graph; however, I believe this item to be highly problematic. The completed version was judged false by a majority of respondents, while the non-completed version was judged true. I explain this anomaly in the next section.

6.2 Problematic Items

A few remarks on individual items which may have been problematic are in order. The unanimous response of *true* for REPAIR TV in the non-completed context may seem surprising. It is important to note that the verb often glossed as REPAIR in ASL might actually be better glossed as TINKER-WITH or WORK-ON. In considering this verb for inclusion in this study, my intuitions told me that even though it is often translated as "repair" or "fix," no endpoint inclusion is entailed by this verb.[20] One may TINKER-

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[20] The verb used here is distinct from the initialized version in that it features flat "O" handhshapes. The initialized version with "F" handshapes has attested uses in English-like signing which are telic, essentially

WITH a TV indefinitely without actually repairing it. Yet the gloss I have used up to this point is most common one. The result in Table 4 demonstrates that tests such as the controlled survey method employed here can clarify the telicity/atelicity of a verb which may have misleading glosses or perceived translation equivalents.

Also perhaps surprising were the mixed responses to some predicates in completed contexts. After looking at a video scene of an actor typing, successfully writing a story, and successfully making a box, why did a couple of participants respond *not sure* or *false*, as seen in Table 4? In the case of TYPING, it has been noted by some observers of my video that the actor's hands cannot actually be seen on the keyboard. Although it is clear he is sitting at a laptop, gazing into a screen, and his fingers can be seen moving, the shot is from behind the laptop, and the keyboard itself is not visible. Perhaps the apparent obviousness of the question caused participants to suspect that the question is an exercise in critical thinking, and that they should adopt a very skeptical stance with regard to things they cannot directly observe. Some feedback from participants in the English counterpart of this survey causes me to suspect that this was sometimes an issue guiding some of the responses, although it does not appear to have been a serious problem.

Similar considerations may be operative with other items. One person answered *false* to the sentence with CATCH MOUSE in the completed condition. The mouse on the video was clearly caught by the actor, but was not, in fact, a real mouse, but a cloth cat toy pulled along by a thread. This issue did not, fortunately, bother many respondents in the English or ASL versions of this survey, but it does make the methodological point

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like the English verb "to fix." This sign is also distinct from the fingerspelled loan sign #FIX, which clearly entails endpoint inclusion.

that when the answers to questions seem obvious, informants may be especially on the look-out for ways to make the task appropriately challenging.

A word about the case of WRITE STORY is in order. The non-completed version of this item was judged as true by a majority of respondents, while the completed version was judged by a slight majority as false. This is the only item in the survey for which this was the case. I believe the reason for this surprising occurrence is the sign chosen for presentation of the sentence in the video prompt. The signer was instructed to use the sign WRITE[with pen/pencil] instead of the sign TYPE. While the actor in the video does use a laptop to write his story, the sign TYPE would have been problematic as it is an inherently manner-related verb, and an activity. The sentence STORY, RAY WRITE could be interpreted as a question about the manner of writing, not about the accomplished task of writing a story. WRITE is iconically based on the dominant hand grasping a pen/pencil, but is often used by Deaf individuals regardless of the physical means of writing, and is more abstract than TYPE, which only means writing by keyboard. However, when judging a sentence as true or false, it is apparent that many participants focused on the manner of writing iconically represented in STORY, RAY WRITE, which did not match the manner of writing in the video stimulus. It is hard to speculate as to why, however, a clear majority of respondents judged the non-completed version of this item as true.

7. CONCLUSIONS

7.1 ASL Signers' Intuitions and the Standard View

In this section I will address the first research question outlined above in (7), repeated below as (11)

(11)   Do native signers' judgments on the truth vs. falsity of sentences match

expected answers based on standard concepts of telicity in the lexical aspect literature? In particular, does the view that [+ADD TO] verbs with quantized arguments are telic find consistent support in the judgments of native signers?

It is necessary first to consider whether the arguments of the verbs in the ASL Experiment survey are quantized or not. ASL nouns are mostly not specified for number, and can have singular or plural referents. None of the nouns in the ASL Experiment survey were of the special class which have unique plural forms (e.g., PEOPLE) or can be pluralized by reduplication (e.g., CHILDREN, TREES). Without a supporting context, sentences like (12) - (13) could be read as having singular or plural objects.

(12)   _____t
        SANDWICH, RAY EAT.
        Ray ate a/the/(some) sandwich(es).
        _____t
(13)   BOOK, RAY READ.
        Ray read a/the/(some) book(s)

While the ASL nouns used in the survey were not of the type morphologically specified for number, the context in which they were presented to participants in the video provided information that constrains the reference of the objects of transitive sentences to quantized entities. In the case of items (12) and (13), for example, Ray was seen eating, partially or wholly, a single sandwich, and reading a particular book (to completion in one scene, only half-way in another).

When the utterances used in this study are embedded in such a context, the reference of the arguments of the verbs is clear: *Ray* is consistently the subject of the verbs, and the patients/themes are the ones foregrounded in the video scenes, unitary entities such as sandwiches, crackers, books, pictures, etc. Hence, the semantic value of these arguments is clearly [+SQA]. Likewise, the verbs featured in the predicates outlined

in Table 5 below, which constitute the experimental variables of the study, are all clearly dynamic, [+ADD TO] verbs.

An affirmative answer to (11) above would require that the native signers queried largely agree on a response of *false* to sentences with predicates featuring [+SQA] arguments and [+ADD TO] verbs presented in non-completed contexts. We can see from Table 5 below, however, that this was not the case across the board. For sentences featuring DRAW PICTURE, WRITE STORY, REPAIR TV, READ BOOK, the majority response in the non-completed context was true, with a K_{free} greater than or equal to .5. These data so far, then, do not support the standard view, though the numbers of responses per item in this dataset is quite small, and more are needed to make robust claims.

7.2 ASL Signers' Intuitions and Flexible vs. Strict Accomplishments

In this section I will address the second research question outlined above in (8), repeated below as (14)

(14) Is a partition of the traditional class of accomplishments into flexible (those that permit non-endpoint inclusion) and strict (those that require endpoint inclusion) supported by the judgments of native signers?

Looking at Figure 12 again, we see that the set of predicates whose sentences in non-completed contexts were given a majority judgment of *true*, i.e., those to the left of 1 on the number line, is well populated, specifically with DRAW PICTURE, WRITE STORY, REPAIR TV, READ BOOK. These are all events which normally do, and at least certainly may, have a preparatory phase, and hence are candidates in this sense for being accomplishments. The fact that the majority judgment of true was fairly categorical compared to their counterparts in the English study described in Chapter 3, however, could cause us to doubt whether they are, in fact, accomplishments or activities. ASL signers seem to have less hesitation in characterizing these sentences in the non-

completed context as true. That is to say, the ASL signers seemed to attach much less importance to the presence of an endpoint as a criterion for truth. Notionally, however, with the exception of REPAIR TV, (which is most likely better glossed as TINKER-WITH TV), these predicates seem to suggest events whose stereotypical instantiations involve endpoint inclusion.

In Chapters 3 and 4, I pointed out a basis for classification which I called the "true-to-false shift." This is the shift that occurs in some items in the survey such that those which had a majority true response set in the completed context had a majority false response set in the non-completed context. This seems to be a good criterion for classification of predicates with respect to the flexible vs. strict distinction. Those accomplishment predicates which undergo the true-to-false shift require endpoint inclusion for a judgment of "true" and are therefore strict. Those which do not undergo this shift do not require endpoint inclusion and are therefore flexible. Table 5, below shows how the predicates are classified with respect to the true-to-false shift. One item, WRITE STORY, as explained above, is in a class by itself in that it underwent a false-to-true shift. I believe this to have been due to a problematic sign choice on my part for the verb WRITE.

True-to-false shift	*EAT SANDWICH* *MAKE BOX* *SIT-DOWN* *CATCH MOUSE* *BREAK CRACKER* *FIND BOOK*
No true-to-false shift	REPAIR TV DRAW PICTURE READ BOOK
False-to-true shift	WRITE STORY

Table 5: Predicates categorized as to true-to-false shift

The case of EAT SANDWICH is interesting and problematic. It lies to the right of 1 on the number line with those predicates for which endpoint inclusion seems to be important. This was not the case for English [*eat sandwich*] in English Experiment One and English Experiment Two, as seen in Figure 2 of Chapter 3 and Figure 3 of Chapter 4, in which [*eat sandwich*] was located on the left side of 1, with the endpoint-flexible predicates. It is not clear why EAT SANDWICH should behave like a telic predicate, while DRAW PICTURE, READ BOOK, and WRITE STORY do not. One possibility for further consideration is the fact that EAT, as produced by the signer for my videos, was one simple path movement which ended in contact at the mouth, which may match a movement signature characterized by Wilbur (2003), Malaia, Borneman & Wilbur (2008), Malaia & Wilbur (2011) as a marker of telicity. It is worth noting that this was an item on which participants did not show much agreement, with a kappa of only .1. More data would be needed to establish this as a factor in the signers' judgments, but it is an interesting issue for further consideration.

All but one of the predicates lying on or to the right of 1 on the number line in Figure 12, predicates whose sentences in non-completed contexts were given a majority judgment of *false* (CATCH MOUSE, BREAK CRACKER, MAKE BOX, FIND BOOK,

SIT-DOWN) are achievements. None involve a preparatory state except for MAKE BOX. Indeed, MAKE is an unusual predicate in ASL. It is the only example that I have been able to identify, in considering the candidate predicates for inclusion in the study, that might have strict, endpoint-inclusion truth conditions and a preparatory state.

The picture which emerges from the limited data so far is that ASL has few lexical signs which can unambiguously be considered accomplishments without the contribution of endpoint particles or other means of explicit result-state marking, as outlined in section 2.1.4 above. Possible reasons for this apparent paucity of lexical accomplishments and its implications for a theory of lexical aspect will be explored in the Chapter 6 of this dissertation.

Chapter 6: Analysis

1. OVERVIEW

It will be my aim in this chapter to analyze the experimental results described in Chapters 3, 4, and 5, along with what is known in the literature about the lexical class of accomplishments, to derive a set of findings. In addition to the experimental results, evidence will also be derived from some classical and new tests of native speaker judgments. Certain conclusions can be drawn with some confidence from the available data, mainly in the direction of challenging some standard ideas about the relationship between verbs, their arguments, and telicity. An analysis will be given of the nature of the endpoint-inclusion reading of English flexible accomplishment predicates and the relevant facts of English will be compared with those of ASL. A hypothesis for a sufficient--though not necessary--criterion for membership in the class of flexible accomplishments will be outlined.

I section 2.1 I will argue that [+ADD TO] + [+SQA] predicates do not necessarily entail endpoint inclusion. For a subset of the predicates included in Experiments One and Two and for a subset of the predicates included in the ASL experiment, a majority of native speaker/signer respondents judged sentences with these predicates as true when they referred to incomplete events; this should not be the case if endpoint-inclusion were crucial to the truth of these sentences. I will show that the endpoint-inclusion inference that is apparent to native speakers of English for sentences with these predicates can be felicitously cancelled with continuations which negate endpoint inclusion, which should also not be the case if endpoint inclusion were crucial to the truth of these sentences.

In section 2.2 I deal with the endpoint inclusion inference that is associated with certain [+ADD TO]+[+SQA] predicates in English. I argue that this inference is a conversational implicature. Unlike presuppositions, this inference does not project through negation. Unlike a conventional implicature, it is not associated with a particular morpheme or lexical item. Like a conversational implicature, it can be felicitously cancelled. This cancelation occurs with continuations that negate endpoint inclusion. This inference can also be felicitously reinforced by continuations that assert endpoint inclusion. I argue that the interaction between a Gricean informativity principle and the available bound denoted by the quantized argument generates the endpoint-inclusion inference associated with English [+ADD TO] + [+SQA] flexible accomplishments. Listeners assume that speakers are being as informative as necessary about the extent of the change/movement covered by the action of the verb, and the bound denoted by the quantized argument is a natural limit for this extent. In default of more specific information, this natural limit is a good assumption on the part of the listener about the extent of the change.

In section 2.3 I propose that predicates representing events which are composed of *atomic minimal events* (Rothstein; 2004, 2008) are flexible accomplishments. Atomic minimal events are iterated discrete subevents of complex events such that each atomic minimal event is a token of the same type. Sentences with minimally-eventive predicates were judged as true by a majority of participants in the English and ASL experiments even when they referred to non-endpoint-inclusive events.[21] However, not all flexible accomplishments (as judged by the results of the experiments in this study) are composed of atomic minimal events.

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[21] With one exception for ASL: the verb EAT. This is addressed in Chapter 5, Section 7.2.

In section 2.4 I discuss the lack of an endpoint inclusion inference for certain [+ADD TO]+[+SQA] predicates in ASL. I argue that the lexicalization strategy for many ASL verbs which correspond to accomplishments in English is iconic in nature and targets the atomic minimal events discussed in the previous section, which are often reduplicated to show incremental movement/change. This explicit iconic reference to atomic minimal events in the form of ASL verbs thus foregrounds the incremental change taking place in the event as opposed to the endpoint made available by the quantized argument of the verb.

In section 2.5 I disagree with Smollett's (2005) contention that the endpoint-inclusion readings of accomplishment predicates that lack overt delimiting bounds arise from world knowledge. I argue that there are two factors that determine the endpoint-inclusion inference: stereotypicality effects and a basic implicature that the action of the verb covers the whole extent of the object/path/scale denoted by the internal argument of the verb (a "basic extent" implicature). When there is a conflict between a stereotypicality effect and the basic extent implicature, the stereotypicality effect takes precedence.

In section 2.6 I address the issue of degree achievements and some similarities and differences in the behavior of these predicates and that of the incremental theme predicates that I hypothesize are flexible accomplishments. I discuss the work of Hay, Kennedy & Levin (1999) and Kennedy & Levin (2008) in which a framework for accounting for the variable telicity of degree achievements is advanced. While Hay, Kennedy, and Levin suggest that this framework can be extended naturally to incremental theme predicates, I give some evidence that degree achievements and incremental theme predicates may not form a natural class with respect to their default behavior in neutral contexts. I suggest that a factor cross-cutting the class of degree achievements and incremental theme predicates is the issue as to whether (i) the action of the verb is

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delimited by the extent of the object represented by its internal argument or (ii) the action of the verb actually changes the physical extent of the affected object its internal argument represents.

2. CONCLUSIONS

2.1 Not all [+ADD TO] + [+SQA] predicates entail endpoint inclusion.

The idea has been standard in the literature on aspectuality since Vendler, and found in various formulations (Dowty, 1979; Krifka, 1989; Verkuyl, 1993; Tenny, 1994) that a verb that expresses dynamism/motion/change and that has quantized arguments[22] forms a predicate which includes an endpoint as part of its truth conditions. In Verkuyl's (1993) terms, a dynamic verb is [+ADD TO] and a quantized NP is [+SQA] (Specified Quantity of A). A particularly attractive idea, outlined in Chapter 2, has been the idea that [+ADD TO]/[+SQA] predicates express a homomorphism between an event and the physical extent of an object (Krifka, 1989; Tenny, 1994). The path through an object, such as the words comprised by a novel, or the entire mass of a three-dimensional object, such as a loaf of bread, serve to delimit the extent of progress through that object by the subject of a verb. Reading a novel comes to a natural end when the last word is read, and no more eating of a given loaf can be done when the last bite has been consumed. It is argued that the end of the physical extent of an object is a special target of the truth conditions of accomplishment predicates.

As noted in Chapter 2, this idea has not gone entirely unchallenged; however, challenges to the [+ADD TO]/[+SQA] idea have mainly been tentative side-notes in work focused largely on other issues. An article by Smollett (2005), mentioned in Chapter 2, constitutes the most thoroughgoing rejection of the [+ADD TO]/[+SQA] idea.

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[22] A quantized NP denotes one or a definite number of countable/bounded entities.

Smollett, using informally-gathered native-speaker judgments, argues that, while quantized arguments provide an endpoint which may be the target of a pragmatically-induced delimitation of an event, [+SQA][23] verb complexes containing such arguments do not entail endpoint inclusion. I consider the experiments conducted for this study to provide empirical support for this main conclusion of Smollett's.

It is difficult to reconcile the [+ADD TO]/[+SQA] idea with the results of the native speaker/signer survey data presented in Chapters 3, 4, and 5. One clear consequence of the [+ADD TO]/[+SQA] idea is that an [+ADD TO]/[+SQA] sentence is false if it refers to a non-completed event, and native speakers should only judge completed events to be true instances of sentences featuring [+ADD TO]/[+SQA] predicates. The experiments outlined in this study were designed to elicit just these types of truth judgments. Participants viewed or read about scenarios in which events did or did not reach their natural endpoint, they were presented with past-tense declarative sentences consisting of simple clauses, and they were asked to judge those sentences as true or false. In several unsurprising cases, such as those involving sentences expressing states, activities, and achievements corresponding to completed or non-completed scenarios, participants' responses were close to unanimous, establishing a baseline of what type of response behavior should be expected for clear cases of truth or falsity.

In English however, the responses to sentences featuring accomplishment predicates--essentially [+ADD TO]/[+SQA] predicates with non-detachable preparatory phases--demonstrated great variability. In Experiment One, the experiment described in Chapter 3, a sizeable set of items featuring [+ADD TO]/[+SQA] verb constellations were judged as true in the non-completed context by a majority of respondents: [*read (title of*

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[23] Smollett uses [+M], *M* standing for 'measuring,' for something like Tenny's (1994) 'measuring-out' feature or Verkuyl's (1993) [+ADD TO] feature.

book)], [*draw a picture*], [*write a story*], and [*eat a sandwich*]. Likewise, in the experiment *English Lexical Aspect and Event Structure* (Experiment Two), described in Chapter 4, a large set of [+ADD TO]/[+SQA] items were judged as true by a majority of respondents in the non-completed context: [*sew a dress*], [*peel an orange*], [*pan of water evaporate*], [*block of ice melt*], [*write a story*], [*paint the barn*], [*knit a blanket*], [*eat a sandwich*], [*drink a cup of coffee*], [*read (title of book)*], [*build a house*], [*devise a plan*], [*establish a business*], [*organize a trip*], [*cup of water freeze*]. Some of these verb constellations are exactly those often cited in the literature as constituting [+ADD TO]/[+SQA] verb constellations, especially [*eat a sandwich*], and [*read (title of book)*], so there is little doubt that the types of predicates chosen for these experiments were those which exhibited properties widely regarded as a sufficient cause for telicity.

Likewise, in the experiment *American Sign Language Aspectual Classes* (the ASL experiment), a set of verb constellations involving a clearly [+ADD TO] verb and arguments which referred unambiguously to [+SQA] entities were also judged by a majority of respondents as true in the non-completed context: [REPAIR TV], [DRAW PICTURE], [READ BOOK], [WRITE STORY]. A caveat must be observed in the ASL case in that ASL lacks definite or indefinite articles, such as *the* or *a*. Indexical pointing may be used to reference previously-established discourse entities, contributing to definite/indefinite readings of NPs, and sometimes contributing number information. However, this indexical pointing is not syntactically obligatory. Bare NPs, as were used in the sentences for the ASL experiment, are widely-attested, especially when the reference of NPs is clear from the discourse context, as it was in the video scenarios used in this experiment. However, bare NPs in ASL are mostly not inherently marked for number; a small number of nouns are inherently plural, such as PEOPLE and TREES, the latter example using a reduplication strategy for pluralization which is not available for

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all nouns. None of the nouns used in this study were of the inherently-plural type, but some could be interpreted as plural in the right discourse context. The context in which the ASL sentences were presented made it clear that they were all of singular reference.

An objection may be made that, while we may be sure that the action-oriented verbs used in the ASL experiment are [+ADD TO], it is possible that the NP arguments of the verbs are not definitely [+SQA] in a grammatical sense. That is to say, perhaps overt marking of the [+SQA] feature is required for telicity, which is not present in ASL. Rather, the NPs are interpretable as quantized from pragmatic clues, but remain grammatically underspecified for [+/-SQA] with a resulting lack of telicity for the verb constellations in which they figure. Such a line of reasoning is certainly valid. A definitive answer to this objection is not available given what is currently known about the status of ASL bare NPs vis-à-vis the [+/-SQA] feature, and this fact points to a potential area for further investigation. It should be noted, however, that many of the verb constellations used in the ASL experiment were found to be telic based on respondents' judgments. If ASL NPs are generally underspecified for [+/-SQA], and if [+/-SQA] is a grammatical feature inherent to argument NPs that is required for the telicity of a predicate, then we should not have expected to see any of the ASL predicates judged as telic, and we are left to conclude that entirely different considerations constitute the ingredients of telicity in ASL, so that the [+ADD TO]/[+SQA] idea is not cross-linguistically applicable.

2.2 The endpoint-inclusion inference in English is a conversational implicature

2.2.1 There is an endpoint-inclusion inference; it is cancelable for many predicates.

It has been suggested by authors such as Hay, Kennedy & Levin (1999), and Lin (2004), that the endpoint-inclusion reading of certain accomplishments in English is an

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implicature, not necessarily an element of truth-conditional meaning. The responses of English speakers in Experiment One and Experiment Two appear to bear out this notion. The responses to certain items in these experiments showed a high degree of agreement among raters for a judgment of false in the non-completed context, while for others, the responses remained majority-true, but with much less agreement among raters. A reasonable way to interpret the mixed judgments of respondents for certain items, especially in the light of the behavior of accomplishments on standard native-speaker judgment tests, is that there is competition between truth-functional criteria and criteria based on a conversational implicature of endpoint inclusion.

Acceptability of non-completed [+ADD TO]/[+SQA] predicates is not a simple matter. Some of these predicates are not acceptable at all in non-completed contexts, while others can be acceptable given supporting linguistic context.

(1)   a.   #John ate a sandwich for several minutes.
        b.   John ate a sandwich for several minutes until he found a bug in it.
        c.   John ate a sandwich for several minutes before he realized it was stale.

(2)   a.   #Chris made a box for several minutes.
        b.   #Chris made a box for several minutes until she got bored and stopped.
        c.   #Chris made a box for several minutes before she realized her scissors were getting dull.

(3)   a.   #Kel wrote the story for a day.
        b.   Kel wrote the story for a day, stopped for a day, and resumed writing the following day.

(4)   a.   #Meg fixed the TV for a day.
        b.   #Meg fixed the TV for a day, stopped for a day, and resumed fixing it the following day.

Items (1)-(4) offer a comparison of some predicates used in Experiments One and Experiment Two in terms of their default behavior vs. their behavior in certain contexts. The famous *for*+time expression test is used here. It is hard to deny that all of the (a) sentences, in isolation, seem at least quite odd. This is likewise true for (2b), (2c), (4b), and (4c). By contrast, the right context remedies this oddness in (1b), (1c), (3b), and (3c).

Items (5)-(10) provide further examples of context relaxing the necessity of endpoint inclusion for some predicates, but not others. All of the (a) sentences at least strongly imply, if not entail, event completion. The (b) sentences with *while*-coordinated clauses vary in terms of whether they allow a non-completed reading: (5b), (7b), and (9b) do, while (6b), (8b) and (10b) do not.

(5) a. Naomi read Ulysses.
     b. Naomi read Ulysses while Randy took a nap.

(6) a. Sandra fixed the TV.
     b. Sandra fixed the TV while Randy took a nap.

(7) a. Ulbricht wrote a memorandum.
     b. Ulbricht wrote a memorandum while Krushchev telephoned Washington.

(8) a. Ulbricht solved the problem.
     b. Ulbricht solved the problem while Krushchev summoned the U.S. ambassador to the Kremlin.

(9) a. Leanne painted Dora's portrait.
     b. Leanne painted Dora's portrait while she sighed impatiently.

(10) a. Roxy made a deal with prosecutor.
     b. Roxy made a deal with the prosecutor while his wife arranged bail.

Two things are clear from the above: (1) Most English [+ADD TO]/[+SQA] predicates carry with them, by default, a strong suggestion of endpoint inclusion; (2) For

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some [+ADD TO]/[+SQA] predicates, this suggestion of endpoint inclusion is defeasible, while for others, it is not. In effect, for this latter class of verbs, which I have called strict accomplishments, I maintain that the categorical nature of the responses given in Experiment One and Experiment Two point to an entailment of endpoint inclusion. For the former class, which I have called flexible accomplishments, I maintain, in line with Lin (2004), that this suggestion of endpoint inclusion is an implicature. I interpret the mixed judgments given for these accomplishments in non-completed contexts as arising from competition between considerations of truth and considerations concerning the felicity of the items in context.

2.2.2 Ambiguity, presupposition, or implicature?

Of the items from the four traditional Vendler classes which appeared in Experiment One, all except accomplishments elicited straightforward judgments from participants as gauged by high kappa scores, with the exception of some clearly problematic items which were detailed in Chapter 3. The categorical judgments of participants on states, achievements, and activities show that informants are capable of giving consistent truth judgments about sentences. The fact that a subset of predicates which are considered accomplishments on standard criteria yielded highly mixed judgments in both Experiment One and Experiment Two shows that some informants are conflicted about items containing them.

When an item is false, it is a comparatively straightforward matter to say so on the basis of some salient criterion which renders it false. When an item is true but infelicitous, hesitation in conferring a judgment of *true* is a natural response of non-linguist informants. Some mental work is involved. Is a sentence false simply because one could think of a better--for example, a more informative--way of saying the same

thing? Informants' answers to this question can be expected to be considerably more variable than in the case of a clearly false item, as indeed was the case with the accomplishment predicates presented to English speakers in Experiments One and Two. This points to a choice in interpretation of the items featuring certain predicates. To determine the nature of this choice in interpretation, it will be necessary to apply some classical tests to determine its nature. I will consider three possibilities for characterizing this choice: ambiguity, presupposition, and implicature.

2.2.2.1 Ambiguity

When sentences are truly ambiguous, their interpretation is free in isolation. It is only in some communicative or linguistic context that ambiguity is removed.

(11)   Jack would arrive in Boston on Friday.

(12)   I saw the astronomer with a telescope.

(13)   Edgar reached the bank before 1:00.

Item (11) is completely ambiguous in the isolated context in which it is presented. We could force a conditional meaning on (11) by appending the continuation *if he left now.* We could force a "future-of-the-past" reading by prefixing it with *It was a cloudy Wednesday. Jack got on the bus in Chicago.* Without any context, however, neither interpretation is preferable. Likewise, in (12), presented in isolation, [*with a telescope*] can take narrow or wide scope freely. Neither interpretation is preferable. Similarly in (13), the lexical ambiguity of *bank* is unresolvable without some context. As the following examples will show, this is not the case with the endpoint-inclusion reading of flexible accomplishments. I repeat (5a) and (7a), above, as (14a) and (15a).

(14)   a. Naomi read Ulysses.
        b. Naomi read Ulysses until she got bored.

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(15) a. Ulbricht wrote a memorandum.
      b. Ulbricht wrote a memorandum until his typewriter jammed.

(16) a. Chris sewed a dress.
      b. Chris sewed a dress, but ran out of material before she could finish.

(17) a. The pan of water evaporated.
      b. The pan of water evaporated until Liz covered it up with plastic.

All of the (a) items in (14-17) above have a clearly preferred interpretation, even presented as they are in isolation. It is natural to interpret the (a) items in (14-17) as endpoint-inclusive events, and a non-endpoint-inclusive reading is only available with the aid of context, such as that provided by the continuations in the (b) items. Thus, the endpoint-inclusion inference of flexible accomplishments seems not to be a matter of ambiguity.

2.2.2.2 Presupposition

Another possibility for characterizing the nature of the endpoint-inclusion inference associated with flexible accomplishments is presupposition. Classic tests for presupposition rely on the projection of presuppositions through contexts that defeat entailment, such as negation, questions, and the antecedent clause of a conditional (Beaver & Geurts, 2013).

(18) a. Gary has three children.
      b. Gary doesn't have three children.
      c. Does Gary have three children?
      d. If Gary has three children, he can claim a lot of deductions.

(19) a. Saul stopped drinking.
      b. Saul didn't stop drinking.
      c. Did Saul stop drinking?
      d. If Saul stopped drinking, we'd better have club soda on hand.

Item (18a) asserts that Gary has three children, infers that he has exactly three children, and entails (among other things) that he has two children. When (18) is embedded in the contexts of negation (18b), a question (18c) and the antecedent of a conditional (18d), the assertion, inference and entailment are all canceled. The presupposition that there is a person named Gary whose reference is recoverable from the discourse context survives all of these contexts, however. By contrast, the presupposition associated with *stop* in (19a) (i.e., *Saul has been drinking in the past*) *projects* through all of the same contexts of negation (19b), a question (19c), and the antecedent of a conditional (19d); items (19b-c) all still presuppose that Saul has been drinking in the past.

What can be learned by applying these contexts to familiar examples of flexible accomplishments?

(20)   a. Robin ate a pancake.
        b. Robin didn't eat a pancake.
        c. Did Robin eat a pancake?
        d. If Robin ate a pancake, the gluten must be killing him.

(21)   Robin ate a whole pancake.

It is clear that the some part of the asserted content of (20a) is lost in (20b-d), but what exactly? Does item (20b), for example, deny that Robin ate any part of a pancake, or only that Robin didn't eat an entire one? A look at entailment patterns may be instructive. The situation with regard to questions is confusing. The following exchanges both seem felicitous.

(22)   Did Robin eat a pancake?
        No, not a whole one.

(23)   Did Robin eat a pancake?
        Yes, but not a whole one.

It is not clear what has happened to the endpoint-inclusion inference of (20a) embedded under a question operator. Answers to (20c) consistent with the endpoint-inclusion inference, as in (22), and consistent with no endpoint-inclusion inference, as in (23), are both acceptable. Also, the endpoint-inclusion reading of the antecedent clause in (20d) seems fairly natural.

However, it is clear that (20b) entails the falsehood of (21). The negation of a sentence should not entail the falsehood of its presuppositions; (19b) does not, for example, entail the falsehood of *Saul has been drinking in the past*. On the strength of this fact, I will not consider a presupposition account a promising direction to pursue in characterizing the nature of the endpoint-inclusion inference.

2.2.2.3 Implicature

Grice (1975) distinguished between conversational and conventional implicatures. Conventional implicatures are those which are part of sentence meaning; they are an aspect of meaning which arises from the meaning of the lexical items in the sentence.

(24)   He is an Englishman; he is, therefore, brave.

Item (24), taken from Grice (1975:44) *says*, or asserts, that the referent of *he* is an Englishman and brave. It does not say, but rather implies, that there is a necessary or causal connection between being an Englishman and being brave. This implicature arises from the meaning of *therefore* (Davis, 2013); saying *P therefore Q* implies a connection between P and Q.

(25)   a. Roy is sober!
        b. Roy is sober today.
        c. It's nice to see Roy sober.

(26)   a. Roy is sober. That is as usual.
        b. Roy is sober today, like most days.
        c. It's nice to see Roy sober. He generally is. It's nice to see anyone sober these days.

In contrast with (24) there is no one lexical item, morpheme, or aspect of sentence structure that triggers the *Roy is not usually sober* inference of (25a-c). As can be seen with the continuations given in (26a-c), the inference is easy to cancel with context. This is not the case with conventional implicatures. We cannot felicitously cancel the inference of (24), for example with *but Englishmen generally aren't brave*. This would clash with the meaning of *therefore*.

As discussed in the previous section, the endpoint-inclusion inference associated with flexible accomplishments in English is cancelable from context in the same way that classic examples of conversational implicature are. This is shown in examples like (14)-(17) above. Moreover, like conversational implicatures, but unlike entailments and conventional implicatures (Coppock, 2012) this inference can be felicitously strengthened, as well as canceled, by continuations.

(27)   #Adults will enjoy this movie, and also grown-ups.

(28)   #Steve has three children. In fact, he has at least two.

(29)   #John is an Englishman; he is, therefore, brave. Furthermore, being English means being   brave.

(30)   #Sharks, fortunately, are rare in fresh waters, and this is a good thing.

(31)   Ray ate a sandwich, and he ate all of it.

(32)   Simon sewed a dress. In fact, he finished sewing it.

(33)   I drank the cup of coffee, and I drank it all.

(34)   Noelle read *War and Peace*; furthermore, she read it *all*.

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(35)   #I fixed the radio; furthermore, I made it work.

(36)   #Shannon convinced Mark to go to the concert; in fact, now he's decided to go.

(37)   #Randy made a birdhouse; furthermore, he made it completely.

In items (27) and (28), the first clause entails the second, reinforcing clause. These items are infelicitous, as are items (29) and (30), in which the first clause conventionally implies the second, reinforcing clause. The words *therefore* in (29) and *fortunately* in (30) overtly trigger implicatures which are redundantly reinforced in the continuations.

Items (31)-(34) have flexible accomplishment predicates in their first clause, and reinforcing continuations in their second. These are felicitous. It is not redundant to reinforce [*eat a sandwich*], [*sew a dress*], [*drink the cup of coffee*], or [*read War and Peace*] with continuations that assert endpoint inclusion. By contrast, items (35)-(37), which have strict accomplishments in their first clause, are infelicitous with continuations that assert endpoint inclusion. On the basis of the cancelation and reinforcement tests, therefore, it seems that the endpoint-inclusion inference patterns with classic examples of conversational implicatures. This is consistent with the assertions of Hay, Kennedy & Levin (1999) and Lin (2004) that the endpoint-inclusion inference for predicates like [*eat a sandwich*] is a conversational implicature.

How might an implicature of endpoint inclusion arise? I believe that the answer to this question lies in the relationship between the Gricean Maxim of Quantity: "Be as informative as required (for the current purposes of the exchange)" (Grice, 1975:45) and the availability of a boundary on the NP argument of the verb. The inference resides in the interaction between the movement/change denoted by the verb and the boundary denoted by the quantization of the NP. If no contrary information is supplied, it is a natural assumption that the movement/change reached this boundary. The hearer assumes

that the speaker is avoiding vagueness and trying to be informative. That is, the hearer assumes that the speaker is not simply leaving out information about boundaries:

(38) Speaker: John ate the largest sandwich in the world.
      Hearer: What?! The whole thing?!

In this exchange above, it would be natural for the hearer to accommodate a partial eating event if [+ADD TO]+[+SQA] predicates were simply underspecified for the degree of movement/change along a scale or if vagueness about this degree of movement/change were a default assumption.

The mereological integrity of entities denoted by quantized NPs is a similarly natural assumption, and is crucial to the notion of an available boundary for movement/change in an event. *There is a sandwich on the counter* by default means that there is a whole sandwich on the counter. NPs such as *a bottle of wine*, *a book*, *a dress*, are not assumed to refer to partial entities by default, although speakers may use these NPs to refer to partial objects, like half bottles of wine, partially written novels, or a dress with one sleeve missing. Hearers tend to conceptualize these as whole entities unless given evidence to the contrary. In the following exchanges, the response of the hearer would be a felicitous, not at all a strange, reaction to the statement made by the speaker.

(39) Speaker: I read War and Peace yesterday.
      Hearer: You must be a speed reader!

(40) Speaker: I'd like you to drink this milkshake.
      Hearer: Well, I'll drink *half*.

It would have been possible, and more informative, for the speaker in (39) and (40) to half modified the quantized NP with expressions like *some of*. The listener assumes that the speaker is giving information about extent of the object/path/scale to be covered by

the action of the verb, and it is natural for the listener to rely on the object/path/scale's entire extent for this purpose.

2.3 Flexible accomplishments and the atomic minimal event property

Some events denoted by accomplishment predicates have what I will call the "atomic minimal event property," following Rothstein (2008; 2004:109-115). An event has the atomic minimal event property if and only if it consists of one or more discrete sub-events (*atomic minimal events*), all of these sub-events being tokens of one uniform type of event. An individual atomic minimal event has an endpoint which defines its completion. A predicate denoting an event having the atomic minimal event property entails the completion of at least one atomic minimal event. Frequently--even typically-- atomic minimal-eventive predicates are used to refer to an event which comprises iterations of the relevant atomic minimal event. In English, as discussed below, transitive atomic minimal-eventive predicates carry an implicature that these iterations persist to cover the whole physical extent of the object of the verb.

The concept of an atomic minimal event is reminiscent of the subinterval property (Bennett & Partee, 1972) widely invoked in the characterization of activities. For events having the sub-interval property, if a clause denoting the event is true, it is true at every sub-interval of the event.

> "Subinterval verb phrases have the property that if they are the main verb phrase of a sentence which is true at some interval of time I, then the sentence is true at every subinterval of I including every moment of time in I. Examples of subinterval verb phrases are: walk, breathe, walk in the park, push a cart."
> (Bennett & Partee, 1972: 17)

Some authors, such as Taylor (1977) and Filip (1999), note that Bennett & Partee's subinterval property is too strong in many cases. Some verbs are *heterogeneou*s, in

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Taylor's terminology. That is, unlike homogeneous verb like *blush*, they consist of identifiably distinct stages, such as those comprised by *waltz*. Certain subintervals of *waltz* that one could choose are too small to independently count as instances of waltzing. That is to say, not every subinterval of an event denoted by a heterogeneous verb is an instance of that event.

Rothstein (2004), in her discussion of the verb *read* and its tendency to be felicitous with both *for* and *in*+time expression phrases, invokes the notion of the "repeated 'minimal' activity events," (p. 109), i.e., individual events such as gazes at letters/words which together constitute a complex reading event. She notes that *Dafna read* Mary Poppins *for hours* is felicitous, whereas *John built a house for hours* is not "because the activity part of *read . . .* consists of the repetition of a single kind of event, whereas the activity part of *build* consists of a series of associated different events" (pp. 114-115). As I will explain further in what follows, all of the predicates included in the three experiments for this study which have this atomic minimal event property (those that consist of repeated atomic minimal events of the same type) failed to undergo the true-to-false shift in their presentation in the non-completed context, suggesting that endpoint inclusion is not a part of their truth conditions.

Rothstein (2008) notes that predicates can be classified broadly as being cumulative or non-cumulative. A predicate *P* is cumulative if, when two distinct events *e* and *e'* instantiate *P*, their sum *e''* also instantiates *P*. A predicate like *run* is cumulative. If *Gwendolyn ran* is true from 1:00 to 1:15 (*e*) and *Gwendolyn ran* is true from 1:15 to 1:30 (*e'*), then *Gwendolyn ran* is true from 1:00 to 1:30 (*e''*) as well. A predicate like [*eat two doughnuts*] is non-cumulative. If *Rick ate two doughnuts* is true within the interval of 1:00 to 1:15 and *Rick ate two doughnuts* is true within the interval of 1:15 to 1:30, then *Rick ate two doughnuts* is not true within the interval of 1:00 to 1:30.

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Rothstein (2008) proposes that cumulative events (denoted by activity predicates) are composed of *minimal activity events*. She distinguishes between those minimal activity events which are *naturally atomic* and those which are non-atomic. Naturally atomic predicates are those "whose unit structure is perceptually salient and given by the world" (p. 186). She notes that "[a] naturally-atomic event is one which has a natural beginning and endpoint, determined by the trajectory that determines the event" (p. 186). Non-atomic events are those which lack such a perceptually-salient beginning and end. Rothstein gives *jump* as an example of a predicate denoting a naturally atomic event, and *run* as an example of a predicate denoting a non-atomic event. Jumping, Rothstein argues, involves a salient, distinct trajectory; individual acts of jumping can be summed into one new event that also instantiates *jump*, but the individual component jumps are still salient. They are, for example, countable. A salient reading of *Lorne jumped twice* is that Lorne accomplished two hops. Non-atomic events like *run* lack countable minimal events: *Lorne ran twice* does not have a reading such that Lorne accomplished two fast strides, but rather than Lorne accomplished some strides during two separate events.[24]

Rothstein (2008) applies her definitions of cumulativity and minimal events to two classes of predicate that researchers have found challenging to classify: semelfactives and degree achievements. As noted above, two events which lack natural endpoints--state events or activity events--*e*, *e'* (that both instantiate an event denoted by the same predicate *P*) can be summed to derive a new "singular event" *e''* which also instantiates *P*. Two events with natural endpoints cannot be summed in this way. A predicate *P* is *S-cumulative* if any two distinct instances of an event instantiating a predicate *P* and related

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[24] I find the specific claim about *run* and similar predicates problematic. The countability test Rothstein uses is revealing, but it is still true that running consists of a cycle of individual trajectories that are not hard to identify. This is especially so for *walk*, a predicate I describe below as consisting of atomic minimal events.   It is noteworthy that both of the signs in ASL commonly used as translation equivalents for *walk* clearly show an iconic representation of these individual, atomic trajectories in their movements.

by the *'R' relation* can be summed, and the sum is a singular entity which instantiates P. The *'R' relation* is temporal adjacency (Rothstein, 2008:181). Semelfactive predicates (Comrie, 1976; Smith, 1991) are homonymous with activity verbs, but denote "single-action" events (Rothstein, 1008:182). Sentences with semelfactives are ambiguous between 'single-action' readings and iterative, activity readings: *Jane coughed* has both a punctual 'single-cough' reading and a 'repeated coughing' activity reading. On Rothstein's account, activity readings of semelfactive sentences represent S-cumulative predicate readings. The activity reading of *Jane coughed* represents a sum of *cough* atomic minimal events; the punctual, 'single-action' reading represents one such minimal atomic event.

Rothstein deals with degree achievements in an analogous fashion. She notes that degree achievements are like semelfactives in that they are ambiguous between instantaneous changes (in this case, changes in degree on a scale) and sums of instantaneous changes (activities). Their telic reading comes from contextual factors or explicit extent modification of the VP. I will discuss in section 2.6 below Kennedy & Levin's (2008) account of how degree achievements get (a)telic readings based on the open vs. closed scales their verbs introduce.

Rothstein's "atomic minimal activity events" represent the level of granularity that is relevant for this study. I will distinguish this as the level of the *atomic minimal event* and will informally characterize it as the smallest level at which at least one full sub-event token of the type designated by the given predicate is completed.[25]

In Figure 13 below, a proposed schema for the level of the atomic minimal event as it pertains to the type of event denoted by the verb *walk* is shown. This verb comprises

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[25] A highly-developed formal framework for representing the levels of granularity relevant to temporal/aspectual structure is found in Fernando (2013).

one or more instances of a very simple atomic minimal event: *step*. One might define a step to mean a movement executed by placing one foot away from the body, shifting the weight of the body to that foot so displaced, and moving the foot not holding the weight of the body closer to the body, so that the body has moved along a path. Clearly this definition is somewhat arbitrary. People viewing a person executing such a move for the first time might not agree that she had "walked" if only one such step was completed. However, a case can be made that, strictly speaking, she did execute the smallest identifiable constituent part of walking, and that the predicate *walk* can be truly applied to this minimal walking-type event.
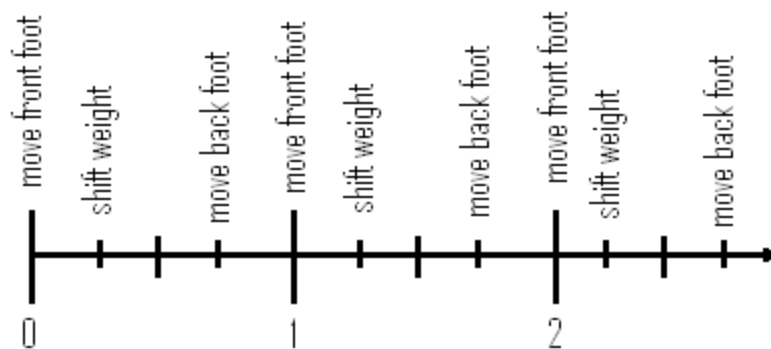
Figure 13: Proposed Atomic minimal event schema for *walk*

Figure 14 is a line representing a multi-part walking event and showing a series of equally demarcated sub-parts represented by the vertical tick marks labeled "0…1…2…3…" Each integer-numbered tick mark represents the starting point of a *step*, and, in the case of ticks 1 and greater, the endpoint of a previous *step*. The intervals between 0 and 1, inclusive, is a *step* atomic minimal event, and likewise for the interval between each integer. Each individual step constitutes, on its own, a minimal walking

event. A person who has executed one or more steps has walked. Hence, the interval [0, 1], labeled A, is an instance of *walk* as is [3, 7], labeled C.
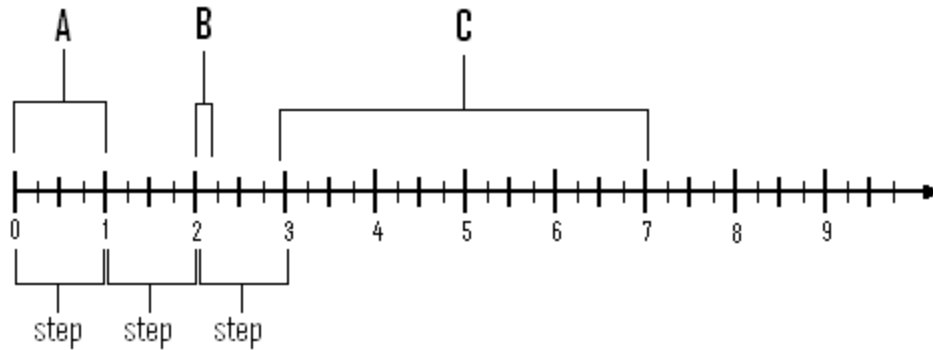
Figure 14: A multi-part walking event

What about the interval [2, 2.23], labeled B, representing an incomplete step? This might represent an action executed by someone who moved one foot forward, and then stopped short of shifting the weight of the body onto that foot or moving the other foot. This incompletely-executed step is unlikely to be judged as an instance of *walk* by anyone viewing it in isolation. Viewing such an action retrospectively as a part of a series of steps, one could judge that it was a proper part of a step. If viewed in isolation as one would view a cut-out part of a film, one might, by an act of inference, judge that this event was part of a walking event. However, only full steps represented by the full, inclusive intervals between integers in Figure 13 can stand on their own as steps or instances of walking in the absence of retrospective knowledge of an event or inferences pertaining to an agent's plans/intentions. The level of granularity of the atomic minimal event is especially relevant to this study in a way that sub-intervals more generally are not. As I will argue below, atomic minimal events specifically are the target of ASL's iconic lexicalization strategy for many verbs.

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The example of *walk* just given illustrates how an activity verb comprises *step* micro events. It is activities to which the sub-interval property, of which atomic minimal events are a specific level of granularity, has been thought to be most relevant. In fact, many purported lexical accomplishment predicates can be seen to comprise atomic minimal events. A useful example is that of *sew.* Any sewing event consists of an act of pushing a needle into a surface followed by an action of pulling thread through the surface, a *stich.* The sewing of any sewn object comprises the execution of one or more stitches. Figure 15 is a proposed atomic minimal event schema for *sew.* As in the case of *walk*, above, the choice of steps is somewhat arbitrary; a case could be made for variant instantiations of *stich*. Nonetheless, sewing a dress can be conceptualized as the pushing-through of a needle and the pulling-through of thread over a surface one or more times.
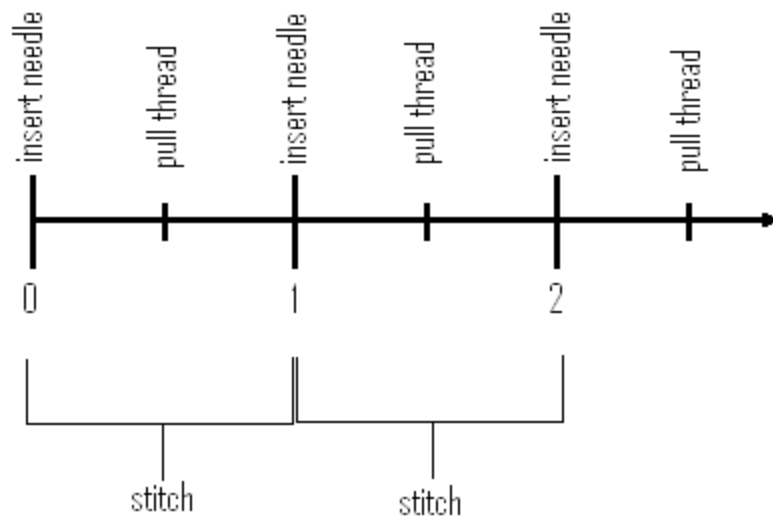
Figure 15: Proposed Atomic minimal event schema for *sew*

To be sure, there is an inherent bias to interpret [*sewing a dress*] as consisting of more than one stich. The confidence of a listener about the truth of an assertion *Ray*

sewed a dress will increase in proportion to the number of stiches completed, ranging from very little confidence based on one stitch to complete confidence based on the completion of the number of stiches needed to complete a garment. This is less a linguistic fact than a cognitive fact about the kinds of judgments about gradable phenomena people tend to make. It is also a (perhaps partially language-specific) fact that there is a bias in English to interpret sentences featuring atomic minimal-eventive predicates as implying the completion of the maximum number of available iterations of the relevant atomic minimal event. In predicates of consumption, such as [*drink a cup of coffee*], for example, consumption of the maximum amount of coffee, divided up into a given number of sips is the most natural interpretation in neutral contexts. It is in this sense that atomic minimal-eventive predicates are flexible accomplishments in English. The endpoint-inclusion reading is a strong implicature, but is not entailed. Figure 14, above, has an arrow at the rightmost end of the number line, indicating that there is no given number of steps after which an act of walking is complete. A complex event schema with a finite number of atomic minimal events, such as that for [*drink a cup of coffee*], would contrast with Figure 14 in having an endpoint marked by a rightmost integer, representing the last available atomic minimal event in the series that makes up the complex event. The consumption of only a finite amount of coffee, divided up into a number of sips, is needed or possible in order to consume a cup of coffee. It is this fact that separates activities like *walk* from accomplishments like [*drink a cup of coffee*]. In the former case, no set number of atomic minimal events is available to serve as the target of an inference of completion. This inference, which obtains for English flexible accomplishments, seems to be largely absent in ASL. These facts are discussed further in the sections which follow.

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In considering the items used in Experiment One and Experiment Two, the verbs which I judge to be atomic minimal-eventive are: *read*, *draw*, *write*, *eat*, *peel*, *drink*, *paint*, *knit*, *sew*. In the ASL experiment, the verbs which I judge to be atomic minimal-eventive are: REPAIR, DRAW, READ, WRITE, EAT. All of the atomic minimal-eventive verbs in Experiment One and Experiment Two fell to the left of 1 on the number lines shown in Figure 2, Chapter Three and Figure 3, Chapter 4, indicating that the application of the control condition, that is, presentation of the sentence in the non-completed context, still resulted in a majority judgment of *true* for these items. This was likewise the case for the ASL verbs in the ASL experiment, as shown in Figure 12, Chapter 5, with the exception of EAT, which fell just to the right of 1 on the number line. The majority of *false* over *true* in this case was very slight. The other atomic minimal-eventive verbs fell well to the left of 1 on this number line. Hence, with no exceptions in the English case, and with only one exception in the ASL case, if a verb is atomic minimal-eventive, it is flexible with respect to endpoint inclusion.

It is important to note that the converse does not apply. In the English case in Experiment Two, many non-atomic-minimal-eventive verbs were given flexible interpretations; *organize*, *establish*, *devise*, and *build* also fell to the left of 1 on the number line in Figure 2, Chapter 4. These are much more abstract verbs which apply to events having possibly quite heterogeneous stages. There are many highly-varied facets to building a house, for example. *Build* fails to have the atomic minimal event property, yet the majority of respondents to Experiment Two judged the item featuring the incomplete version of [build a house] to be true. I believe that one possible factor influencing judgments of this type is the salience of the effects of incremental predicates. What I mean by this is that, in cases like [*eat a sandwich*], [*build a house*] or [*create a report*] the action of the verb leaves salient effects: the missing part of a sandwich, the

partial structure of a partially-built house, the pages of an incomplete report. The larger the effect of the verb on its object--in other words, the more incremental progress has been made--the more salient this partially-created entity (or partially-missing entity, in the case of consumption predicates) will be, whether or not the predicate in question has a natural endpoint. It is not surprising that varying degrees of event completion may influence informants to make gradient judgments about the acceptability of sentences as descriptions of more-or-less complete events, even when they are asked questions about truth vs. falsity. It is possible that [*build a house*] is, in fact, a strict accomplishment and that there is some competition for salience between the endpoint that strict accomplishments make available and the incremental nature of some predicates of creation.

This same salience factor poses a potential problem for my use of atomic minimal events as a sufficient condition for membership in the class of flexible accomplishments. Given that a large effect of the verb on its object is more salient than a small effect, and that this salience influences truth judgments, is it a problem that even a single atomic minimal event falls within the definition of an atomic minimal event predicate? For example, if John only ate one bite of a sandwich, is *John ate a sandwich* true?[26] Certainly, it is the case that many respondents would hesitate to judge this sentence as true in this context. However, there is a sense in which it is literally true: John did affect something by eating, and that thing he affected was a sandwich. The hesitation respondents would have in judging this sentence as true would most likely decrease as the number of atomic minimal events involved in the event increased.

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[26] I am indebted to John Beavers for this question.

In fact, it seems to me that this is an issue of competing psycholinguistic factors: truth conditions vs. gradience/salience effects. Gradience/salience effects are probably very influential in the judgments made by informants, but I do not believe that judgments of truth/falsity can be reduced to gradience. On the other end of the spectrum nearly-but-not-quite-complete telescope assembling events, report-creating events, etc., will likely often elicit a judgment of *false* for *John assembled a telescope, John created a report*. This shows that there is a literal true/false reading for these sentences that some respondents may be more sensitive to, while other respondents are more sensitive to gradience. In all the experiments designed for this study, I took care to ensure that all non-complete incremental events depicted/described were well under way--but also well short of completion--when the action terminated so that questions of precise description would not arise.

2.4 Lack of endpoint inclusion inference for ASL [+ADD TO]/[+SQA] predicates

In contrast to the English case, informants' judgments in the ASL experiment for ASL sentences involving what would be considered accomplishments on standard criteria were less variable as shown by the high kappa scores for most of these predicates. The non-completed versions of [DRAW PICTURE], [WRITE STORY], and [READ BOOK] were judged true by a majority of respondents with kappa scores of 1, .5, and .5 respectively. These same predicates were judged true by English speakers in Experiment One at .625, -0.018, and .196, respectively, showing considerably less agreement.[27] Only

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[27] Recall that [REPAIR TV] is most likely better glossed [TINKER-WITH TV], as mentioned on Chapter 5, as this ASL verb has proven to actually be an activity. Hence, it is not considered here for purposes of comparison with English [*fix the TV*]. There is most likely no implication that TINKER-WITH results in a state of functionality of the TV, in contrast with the English [*fix TV*], for which functionality is entailed.

in the case of [EAT SANDWICH] was the majority judgment in the non-completed case false (interestingly, in contrast with English); agreement in this case was quite low at .1.

It was claimed in the above section that English [+ADD TO]/[+SQA] predicates generally imply, but do not necessarily entail, endpoint-inclusion. It is anecdotally widely-believed that the ASL counterparts of many verb complexes in English that imply endpoint-inclusion lack this meaning without additional linguistic reinforcement; the experiment described in Chapter 5 seems to reinforce this notion. What is behind this difference between English and ASL? In this section, I will discuss two main candidate factors for the absence of this implicature in ASL: the grammatical resources of ASL which permit overt encoding of aspectuality and the nature of the lexicalization of aspects of event structure. It is the latter which I will suggest is response for the lack of an endpoint-inclusion default in ASL.

2.4.1 Endpoint inclusion and the grammatical resources of ASL

A class of lexical items to which I referred to in Chapter 5 as lexical result-state markers (RSMs) is available for certain verbs--especially those of consumption--which force an endpoint-inclusion reading. When they appear, they are consistently in post-verbal position. These markers are not found with all verbs, however, and there are many verbs which do not have an associated RSM. When they appear, they unambiguously denote endpoint inclusion; a clause featuring an RSM is telic. Examples of RSMs given in Chapter 5 include DRAIN for verbs of drinking and NOT-A-TRACE, associated with verbs of cleaning, wiping, or vacuuming.

Some verbs whose telic/atelic status may be flexible or ambiguous have counterpart manner verbs which are inherently telic. Such is the case with DEVOUR, which, on its own, without any RSM, entails complete consumption of a quantized unit of

food. It carries an additional manner feature implying rapid consumption, so that it is not an exact synonym of EAT. Other examples include SPEND vs. SQUANDER, the latter denoting the spending of all one's money, and PAY vs. PAY-OFF, the latter being a mono-morphemic sign (not having an associated particle analogous to English *off*) that denotes the complete payment of a debt.

The two resources for expressing endpoint inclusion mentioned above both have counterparts in English. Prepositions associated with phrasal verbs often act as result-state markers: *eat* vs. *eat up*, *drink* vs. *drink up*, *pay* vs. *pay off*, *use* vs. *use up*. This is not a fully productive feature of English verbs, but it is not for ASL either. Likewise, many English verbs have counterpart, hyper-telic verbs: *eat* vs. *devour*, *drink a bottle of wine* vs. *drain a bottle of wine*, *compress* vs. *flatten*. A third endpoint inclusion resource, to be discussed in the following section, telic kinematic signatures, has no counterpart in English. There is no morphophonological feature of English verbs that explicitly signals telicity.

The characterization of the grammatical resources of ASL I have given so far in this section and the attendant semantic behavior of verbs is reminiscent of certain features of languages such as Mandarin or Hindi as described in the work of Koenig and Muansuwan (2000), Koenig and Chief (2008), and Arunchalam and Anubha (2011). The incompleteness effect described by these authors is in some ways quite similar to the ASL case. Verbs which are thought to require or strongly imply endpoint inclusion in English lack this requirement or implicature in ASL, and ASL, like Mandarin and Hindi, has particles closely associated with the verb which can force a telic reading. One thing to note, however, is that the class of verbs for which the incompleteness effect has been described in Mandarin and Hindi is in fact a very different class than that for ASL. Verbs like DIE and KILL, for example, are unambiguously telic in ASL, just as they are in

English. English and ASL are alike, in fact, in allowing flexible readings of verbs which have the atomic minimal event property, to be fully explained below. By contrast, many Mandarin "incompleteness effect" verbs lack this property entirely: *xiū* (*repair*), *quàn* (*persuade)*, *shā* (*kill)*, for example (Koenig & Chief, 2008). It seems to be the case that result states are simply excluded from the meanings of a certain class of Mandarin and Hindi verbs, to be added explicitly with resultative markers.

It is tempting to think that the availability of post-verbal resultative markers such as are found in ASL, Mandarin, and Hindi explains the lack of an endpoint-inclusion implicature. It could be the case that a type of Gricean informativity maxim (Grice, 1975) is flouted by the use of sentences which are not marked with resultative particles in describing endpoint-inclusive events. Arguably, the speaker/signer would have used a resultative particle if an endpoint-inclusion reading was intended, and the absence of a resultative particle is insufficiently informative in this case.

Three factors lead me to reject this line of reasoning. First, ASL signers I consulted told me that sentences without RSMs, such as are used in the ASL experiment, are not necessarily endpoint non-inclusive. Endpoint-inclusive readings of these sentences are possible in context, while the presence of an RSM forces an endpoint-inclusive reading. Secondly, as noted above, English also has similar means of endpoint-inclusion marking, such as phrasal verbs: *eat* vs. *eat up*, for example. Yet [*eat the sandwich*] has a clear implicature of endpoint inclusion. This should not be the case if the availability of [*eat up the sandwich*] rendered [*eat the sandwich*] insufficiently informative. Thirdly at least in the case of Mandarin, sentences with verbs like *kill* with no resultative particle still seem to suggest endpoint inclusion in most contexts. This inference is, however, defeasible, although not for all speakers, according to Koenig & Chief (2008).

2.4.2 ASL, the Event Visibility Hypothesis, and Atomic minimal events

A recently much-studied factor pertaining to the telicity of ASL verbs, outlined in Chapter 5, is the notion of the "kinematic signature," contributed by the work of Wilbur (2003) and Malaia & Wilbur (2010). Their central claim is that telic verbs in ASL are marked by characteristic features of movement (as outlined in Chapter 5). If this is true, telicity is marked via bound verbal morphology in ASL, somewhat analogous to the case in Slavic languages, and this presents a marked contrast with English verbs, for which telicity is a "covert category" (Smith, 1997).

The Event Visibility Hypothesis (EVH) proposed by Wilbur (2003) posits that there are movement features associated with verbs in signed languages which represent aspects of event structure. In particular, Wilbur (2003) and Malaia & Wilbur (2010) claim that a set of "kinematic signatures" associated with ASL verbs can serve as markers of telicity.

In this section I will argue that the reduplication of signs representing atomic minimal events is used to convey most accomplishment events in ASL, and that these atomic minimal event signs are iconic in nature. Informally, in the sense of 'iconic' that I intend, a sign is iconic if it represents aspects of the conceptualization of physical reality in a way that is salient to users of the language. A good metric for this salience might be the extent to which signers can agree on an iconic motivation for a given sign.[28] How does this view relate to ideas of iconicity apparent in Wilbur's EVH?

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[28] This metric was suggested to me by Hans Kamp, who mentioned a distinction between iconicity and schematicity: symbols in the Chinese logographic writing system are said to be 'schematic' in the sense that their iconic motivation may be apparent to informed users of the system, but not transparent to non-users. Once the meaning of a schematic logogram is known, its iconic motivation becomes apparent, but the meaning of the logogram cannot be guessed simply on the basis of its schematic features. I believe this to be highly analogous to the case with many ASL signs.

Among the works of Wilbur's I cite in this study, it is only in Wilbur (2003) that she uses the word *iconic* with regard to the EVH:

> The mapping of the semantic notion of telicity with various phonological forms is argued to be logically motivated but not merely iconic in that this mapping is only morphologically relevant within the predicate system, including their deverbal nominals, and in adverbial modifiers that share the same specific semantic characteristics. (Wilbur, 2003: 354)

Wilbur, then, holds that the iconic nature of sign interfaces in a very systematic way with the structure of predicates. Malaia, Borneman and Wilbur (2008) cite Ramchand's (2008) framework in which a set of three hierarchal *projections* (initiation projection: InitP; process projection: ProcP; result projection: ResP) is proposed to represent the structure of events. These phrases can be linked to the lexical/morphological structure in language-specific ways. Malaia, Borneman and Wilbur suggest that result projections can be overtly identified by kinematic signatures associated with telicity in the EVH.

The inventory of kinematic signatures that Wilbur (2003) and Malaia & Wilbur (2010) propose, along with some example signs, is given below in Table 6.

Kinematic Signature	Example Sign
change in handshape aperture	THROW
change in position	POSTPONE
movement to hold	COME-HERE
movement to hold	FIND
movement to contact	HIT
change in handshape aperture; movement to contact	CATCH

Table 6: Kinematic Signatures and Telic Verbs

One thing to notice about each of the signs given as an example above is that each features an iconic path-like quality. In the case of THROW, the opening from an S handshape to an H handshape is suggestive of the first stages of a projectile leaving the hand. In the case of POSTPONE, a physical metaphor is used of picking up an object and moving it back, away from the signer, into the future space of the *past↔future* timeline that ASL uses to characterize temporal relations (Valli, 2000). Thus a clear path is established in the movement contours of this sign. In the case of COME-HERE, a path is drawn in space from a distant locus to a locus proximal to the signer. FIND is the iconic representation of picking up an object, a patient-to-goal path. Likewise, in HIT, a path is described between a starting point of the movement of the S handshape and the target 1 handshape, representing a path from the subject to the patient of the hitting event. CATCH is iconic with respect to the path from an agent to contact with a grabbed object

Each of the signs in Table 6 above is a verb which denotes a telic event on its own, with no support from resultative markers or from the other resources ASL has available to mark endpoints. There are many verbs, however, which have kinematic signatures associated with telicity, but whose meaning is not unambiguously telic; for example, DRINK, which involves a change in handshape orientation, or EAT, which involves a movement to a contact, both have movement contours Malaia & Wilbur associate with telicity, but native signers do not judge these verbs to be telic, at least not with a high level of agreement. Some examples of this class of verbs and their associated kinematic signatures are given below in Table 7.

Kinematic Signature	Example Sign
change in handshape orientation	DRINK
movement to contact	EAT
movement to hold	READ
movement to hold	WRITE
change in handshape orientation; movement to hold	SEW-BY-HAND

Table 7: Kinematic Signatures and Atelic Verbs

The example signs referred to in Table 7 are simple citation-form verbs. According to my informants, sentences featuring signs of this type without reduplication are acceptable. They may also all undergo reduplication to show time-extended aspectuality.

A basic difference may be seen between the class of verbs given in Table 6 and that given in Table 7. The verbs in Table 6 are ones which lexicalize an iconic representation of a simplex event. The events represented by these verbs are simplex in the sense that they lack discrete stages in their transition from source to goal. These verbs are all path-like in their iconic representation of the reaching of an endpoint. These verbs are also inherently telic in the familiar sense of the literature on aspectuality: they denote the reaching of a natural endpoint typically associated with the type of event they describe.

By contrast, those verbs in Table 7 commonly represent complex events composed of discrete simplex constituent events. Each of them is employed in the representation of events which typically contain iterations of a simpler event over part or all of the physical extent of an object or path. In effect, each of the verbs in Table 7 lexicalizes an atomic minimal event. Each atomic minimal event is telic in a more limited sense of that term than is generally used in the literature. For example, each drinking

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atomic minimal event involves the raising of a container to the mouth, a path to contact; each eating atomic minimal event involves placing of the item in the mouth, a path to contact. In both of these cases, the entire physical extent of the object may be partially or completely contacted, experienced or affected in the course of iterated atomic minimal events, or not.

Many verbs in ASL that are common translation equivalents of English lexical accomplishment predicates comprise atomic minimal events in this way. As mentioned above, sentences featuring these verbs in their simple, one-movement citation forms are attested, and have been validated by my informants as good, valid ASL sentences. What do they mean, in terms of endpoint inclusion? They may be used to describe an endpoint-inclusive event, even without RSMs or lexical aspectual markers such as FINISH. However, they may quite easily have non-endpoint-inclusive meanings, as shown by the judgments of participants in the ASL experiment. Reduplication of these signs, however, leads to temporally-extended, imperfective readings (Rathmann, 2005).   True accomplishment events--those with a temporally-extendable preparatory phase and an entailment of endpoint inclusion--typically require reduplication of the verb plus the use of an RSM or other lexical means of result-state marking. Some examples will illustrate.[29]

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[29] The ASL examples given here and subsequently follow glossing principles widely used in the ASL linguistics literature (Baker-Schenk & Cokely, 1980). Individual lexical signs are represented by an English word in all caps. Words joined by a dash, such as DRINK-ALCOHOL represent a single sign which needs more than one English word to convey some of the meaning of the sign. CL represents size and shape classifiers. A hash mark (#) represents items that are fingerspelled. A plus sign (+) represents repetition of a sign. Overbars with script notations, such as _____ *t* over a string of words indicates an intonational phrase, represented by non-manual head, eyebrow, body movements that are synchronized with that string of signs. In (1) and (2) above, this overbar represents a Topic phrase; topicalized information is assumed to be already established in the discourse context.

(41) a.   <u>   t</u>
        PIZZA, #RAY EAT.
        Ray ate (some of) the pizza.

    b.   <u>   t</u> <u>   t</u>
        PIZZA, CL$_{round,}$ #RAY EAT++, NOT-A-TRACE.
        Ray ate the whole pizza.

(42) a.   <u>   t</u> <u>   t</u>
        COCA-COLA, BOTTLE CL$_{medium-height,}$ #RAY DRINK.
        Ray drank (from) the bottle of Coca-Cola.

    b.   <u>   t</u> <u>   t</u>
        COCA-COLA, BOTTLE CL$_{medium-height,}$ #RAY DRINK
        DRAIN.
        Ray drank the whole bottle of Coca-Cola.

(43) a.   <u>   t</u>
        BOOK, #RAY READ.
        Ray read (part of) the book.

    b.   <u>   t</u>
        BOOK, #RAY READ++, END.
        Ray read the book to the end.

I would suggest that the (b) sentences in (41)-(43) represent by far the most typical way of representing accomplishment-like events in ASL. The temporal extension of the preparatory phase may be represented by reduplication of the main verb. The endpoint is represented by an RSM, as in (41b) and (42b), or by a lexical endpoint marker for verbs that are not typically associated with any particular RSM, such as READ delimited by END in (43b).

        Single-word lexical items whose truth conditions require a preparatory phase and endpoint inclusion, seem to be quite rare in ASL. The only such verb I can offer as an example is MAKE, which, in accordance with the judgments of participants in the ASL experiment, strongly requires endpoint inclusion. The items with [MAKE BOX] in the non-completed context were unanimously judged to be false. As noted in my discussions

of Experiment One and Experiment Two, the English counterpart of this verb, *make*, was also shown to be highly telic.

It is interesting to observe the behavior of the verbs given in the two tables above vis-à-vis the "continue to do x" test suggested above for distinguishing accomplishments from achievements. This test can very conveniently be applied to ASL as well as English. First I will consider the English case.

(44)   Ray continued to daydream.

(45)   Ray continued to walk.

(46)   Ray continued to break the cracker. (iterative reading only)

(47)   Ray continued to find the book. (repeated hiding and finding of a book)

(48)   ?Ray made the box, paused, then continued making it.

(49)   ?Ray fixed the radio, paused, then continued fixing it.

(50)   Ray read the book, paused, then continued reading it.

(51)   Ray ate the sandwich, paused, then continued eating it.

Items (44) and (45) show the compatibility of *continue to* with activities, as expected. It is clear from (46) and (47) that *continue to* is also compatible with achievements, but the result is a coercion into a repetitive event. Items (48) and (49) show that *continue to* is not compatible with a pausing and re-starting reading for strict accomplishments, while (50) and (51) show *continue to* is compatible with such readings for flexible accomplishments.

Next I will consider the ASL case with regard to this test.

(52)   RAY PONDER, CONTINUE.
        Ray continued to ponder.

(53)   RAY WALK, CONTINUE.

Ray continued to walk.

$\overline{\qquad\qquad}$t

(54)   a. ?CRACKER, RAY BREAK, CONTINUE.
      Ray continued to break the cracker.

      $\overline{\qquad\quad}$t

      b. CRACKER, RAY BREAK++, CONTINUE.
      Ray kept on breaking the cracker(s).

      $\overline{\qquad}$t

(55)   a. ?BOOK, RAY FIND, CONTINUE.
      Ray continued to find the book(s).

      $\overline{\qquad}$t

      b. BOOK, RAY FIND++, CONTINUE.[30]
      Ray continued to find the books.

      $\overline{\qquad}$t

(56)   a. ?BOOK, RAY READ, CONTINUE.
      Ray continued to read the book.

      $\overline{\qquad}$t

      b. BOOK, RAY READ++, CONTINUE.
      Ray continued to read the book.

      $\overline{\qquad\qquad}$t

(57)   a. ?SANDWICH, RAY EAT, CONTINUE.
      Ray continued to eat the sandwich.

      $\overline{\qquad\qquad}$t

      b. SANDWICH, RAY EAT++, CONTINUE.
      Ray continued to eat the sandwich.

Items (52) and (53) show, as in English, the compatibility of CONTINUE with activities. Items (54) and (55) show that CONTINUE is also compatible with achievements, but only with reduplication of the verb indicating a repetitive event. Since BREAK and FIND are achievements, only a complex event comprising multi-event iterations of these verbs can CONTINUE. Items (56) and (57) show that CONTINUE is fine with verbs like READ and EAT provided their reduplicated forms are used, as in the (b) sentences. They are unacceptable with non-reduplicated verbs forms, as in the (a) sentences. Essentially,

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[30] This reading is permissible because BOOK is unspecified for number. A plural inference is thus possible with a reduplication of the verb (FIND++), and this sentence is felicitous with CONTINUE. This contrasts with the English example (47), with the singular *book*. Here, a strange reading is the only possible one: the hiding and re-finding of the same book.

these verbs behave the same way as achievements with regard to CONTINUE: they are acceptable if iterated, not otherwise.

In general, it seems that accomplishment events in ASL are typically conveyed via predicates which consist of iterated atomic minimal-event type verbs. These predicates require explicit marking via lexical means in order to entail endpoint inclusion. The verb in its unmarked, aspectually neutral form does not entail or imply endpoint inclusion. It seems that ASL has a notable paucity of lexical accomplishments (perhaps only one, by my count: MAKE).[31] This contrasts with the many found in English.[32]

It is not possible in the scope of this study to give a definitive answer to the question as to why an implicature of endpoint inclusion arises in English with the types of verb constellations under study, but not in ASL. However, the tendency, as outlined in this section, for ASL to choose visually-salient atomic minimal events in its lexicalization strategy for many verbs which are involved in the representation of accomplishment events suggests a reason for this difference. The atomic minimal-eventive nature of the event being expressed by verbs such as SEW, DRINK, READ, is foregrounded by the iconicity inherent in their outward form. The opacity of the counterpart English verbs makes their atomic minimal-eventive nature less salient. When considering whether a partial event of reading *War and Peace* is an instance of [*read (title of book)*], the representation of a *read* atomic minimal event in the iconic form of the sign READ encourages an affirmative answer. Indeed, any other answer might seem odd in the light of this fact. In English, by contrast, no salient marker of atomic minimal-eventiveness is

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[31] I do not consider the example of MAKE with CONTINUE. MAKE is problematic in that it can be reduplicated. When it is, it is not clear whether its meaning is compatible with temporal extension of the making event of a single object, or whether MAKE++ must indicate iterative making of plural objects. The fact that ASL nouns general do not mark number makes examples difficult to interpret.
[32] Strict accomplishments in English are, however, almost all latinate, *make* being a notable exception.

available, and there is a corresponding hesitation to use the completion of one or more atomic minimal events as criteria for the truth of the sentence, as evidenced in the lower agreement among respondents to Experiment One and Experiment Two to the truth of sentences featuring [*read (title of book)*] in the non-completed context. The salience of an available endpoint associated with these accomplishment predicates then wins out for some, but not most, respondents; a minority give a judgment of *false* to these sentences in the non-completed context.

Given the link I propose between the salience of atomic minimal events in some ASL predicates, their iconicity, and non-endpoint-inclusive readings of these predicates, the question might arise whether iconicity in general should be expected to lend itself to predicates with endpoint-inclusive readings apart from those which lexicalize atomic minimal events. I do not think this is to be expected. Iconicity can be seen in the path-like movements seen in signs like DIE, POSTPONE, COME-HERE shown in Figures 8-10 in Chapter 5. These signs are clearly telic. The reason that signs like SEW are atelic relates not directly to the fact that the atomic minimal events involved in this sign are highly iconic, but rather to the fact that they are reduplicated a process associated with time-extended events in ASL. That reduplication itself is iconic in nature is probable, however. It seems, then, that iconicity in sign can convey both telicity and atelicity.

2.5 Endpoint inclusion and world knowledge/stereotypicality

Smollett (2005) maintains that the factor which is responsible for telic readings of some [+ADD TO]/[+SQA] predicates and not others is world knowledge. She gives some examples such as the following:

(58)   a. ?Kathleen ate an apple for a couple of minutes.
         b. The ant ate the apple for a week until it rotted into the ground.

(59) a. ?Jack built a house for a month.
      b. Stephen built a Lego tower for three hours.

(Examples from Smollet, 2005:49-50)

While the (a) sentences are undeniably odd, at least without some supporting context, the (b) sentences seem quite natural. An element of world knowledge is clearly involved here. In the case of (58b), since we know that ants cannot typically eat a whole apple in one sitting, the week-long, non-completed eating event is natural. Likewise, the building of a house is stereotypically something that is done with a view toward completion. It is not something that is ordinarily done for amusement. It is very typical to build with Lego blocks with no view toward completion of any structure, but merely for amusement. Hence, sentence (59b) is very natural as a non-completed event.

Smollett raises the point that many of the examples of [+ADD TO]+[+SQA] predicates given in the literature are of the type that lend themselves easily to stereotypical endpoints. The classic examples are of consumption of items of food, production of dwellings, reading of novels, and the like. These are all stereotypical activities which have well-known end results as a desired or planned outcome. It is not surprising that there would be a tendency for listeners to interpret sentences featuring these predicates as having reached the stereotypical endpoint by default.

In many of Smollett's examples, atelic readings of verbs can be obtained with non-stereotypical subjects (an ant--instead of a person--eating an apple) or objects (building a Lego tower, as opposed to a house). There are some verbs, however, that similarly lend themselves to atelic readings in [+ADD TO]/[+SQA] syntactic formations, as some examples will illustrate.

(60) a. Pat painted the car.
      b. Pat scratched the car.

(61)   a. Teddy dyed the jacket.
          b. Teddy stained the jacket.

(62)   a. Harris smoked a cigar.
          b. Harris burnt a cigar.

The (a) examples above feature verbs whose stereotypical instantiations involve an endpoint, while the verbs in the (b) examples seem to be much more open with respect to an endpoint. The predicate [*scratch the car*] could felicitously involve even a very small scratch, not covering the physical extent of the car in any way. Likewise, [*stain the jacket*] does not necessarily affect the entire physical extent of the coat, nor does [*burn a cigar*] necessary involve total consumption of the cigar, or even a considerable degree of consumption, unlike [*smoke a cigar*].

Many elements of world knowledge or stereotypicality may be involved, then, in the naturalness of non-endpoint-inclusive readings of ostensibly telic predicates. Nonetheless, it does not seem to be the case that world knowledge/stereotypicality is the whole story with regard to the telic/atelic interpretations of [+ADD TO]/[+SQA] predicates. Consider items (63) - (64) below.

(63)   Colton ate the world's longest sandwich.

(64)   Ken drank a bottle of Kahlua all by himself this morning.

Items (63) and (64) involve lexical accomplishment predicates which were found in Experiment One and Experiment Two to be flexible in the sense that they permit non-endpoint-inclusive readings. Clearly, these readings are often not the most natural ones, but they are, strictly speaking, available. Nonetheless, (63) and (64) also clearly have very natural endpoint-inclusive readings, and they are surprising statements on their own. The fact derived from world knowledge that only under special circumstances could a

person eat the entirety of the world's largest sandwich (perhaps gradually, over the course of years), or the stereotypical fact that people do not generally consume an entire bottle of Kahlua in one sitting, do not cause a reader/listener to immediately accommodate or coerce an atelic interpretation of these sentences. It does not seem, then, that world knowledge/stereotypicality alone can account for the implicatures of endpoint inclusion that arise with many English [+ADD TO]+[+SQA] predicates.

The role of the physical extent/path/scale denoted by quantized NP in delimiting events, which I have suggested is a conversational implicature (I will call it the "basic extent implicature") interacts with stereotypicality in some interesting ways. It seems that there is a basic implicature that arises with [+ADD TO]+[+SQA] predicates that serves as a default: unless there is information to the contrary, the hearer presumes that the full physical extent/path/scale denoted by a [+SQA] NP serves as the bound reached by the action of the [+ADD TO] verb. Predicates may also be specified, however, for how much of the physical extent of the object/path/scale, etc., is contacted/affected by the action of the verb. This stereotypicality feature, related to world knowledge, may specify full or partial covering of the physical extent of the object/path/scale. The stereotypicality feature, when there is one, will override the basic extent implicature if they are in conflict.

In the examples that follow I will annotate each item as to the stereotypicality feature of its predicate. Some predicates carry a stereotypicality feature of full physical extent/path/scale affectedness (SF: full). Others carry a stereotypicality feature of partial extent affectedness (SF: partial). Others carry no stereotypicality feature (SF: null). It is assumed that the basic extent implicature is operative for all [+ADD TO]+[+SQA] predicates. The (a) examples are paired with counterpart (b) examples which have future tense and *in*+time expression phrases. As Beavers (2008) suggests, sentences with the

future tense with *in*+time expressions seem to provide a particularly robust contrast between inceptive (*after x time*) readings and duration (*it will take x time to do y*) readings.

(65)   a. Terry sanded the watermelon.[33] (SF: null)
        b. Terry will sand the watermelon in ten minutes. (*after* and duration readings)

(66)   a. Sam stained the leaves. (SF: null)
        b. Sam will stain the leaves in an hour. (*after* and duration readings)

(67)   a. Gene moistened the tablecloth. (SF: null)
        b. Gene will moisten the tablecloth in 45 seconds. (*after* and duration readings)

Items (65)-(67) are non-stereotypical events. Hearers do not have information from world knowledge concerning how much of the physical extent of a watermelon people typically sand, since this is not a type of event that happens frequently, nor is staining leaves an activity that world knowledge provides information about. The event associated with (67a), moistening a tablecloth, while not a strange activity like those represented in (65a) and (66a), is one of uncertain purpose. There could be many reasons for moistening a tablecloth, from removing a stain (partial extent affectedness) or preparing it for the washing machine by soaking (full extent affectedness). When the example is presented in isolation, no one extent affectedness feature seems salient. The predicates in (65)-(67), lack a stereotypicality feature for extent affectedness, but the hearer can rely on the basic extent implicature to infer that the entire physical extent of the affected object is covered by the action of the verb. To my intuitions, (65a)-(67a) have a preferred full-extent reading. Moreover, all of the (b) examples (65)-(67) permit both an after reading and a duration reading. This is consistent with telic predicates more generally: *John will drive*

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[33] In all examples with *sand*, I intend it to mean to use sandpaper to abrade the surface of an object.

to Dallas in an hour and *Flora will devour the pancake in 40 seconds* likewise have both *after* and duration readings.

Items (68)-(71) have a stereotypical feature of partial extent affectedness.

(68)   a. Lupe scratched her eyeglasses. (SF: partial)
       b. Lupe will scratch her eyeglasses in a few minutes. (*after* reading only)

(69)   a. Ivan dented the car. (SF: partial)
       b. Ivan will dent the car in a few hours. (*after* reading only)

(70)   a. Eric stained the tablecloth. (SF: partial)
       b. Eric will stain the tablecloth in a few minutes. (*after* reading only)

These items all denote events in which the action of the verb stereotypically does not reach the full physical extent of the affected object. Hearers have information from world knowledge that scratching eyeglasses, denting cars, and staining tablecloths all typically happen accidentally. Here, the stereotypicality feature of partial extent affectedness conflicts with the basic full extent implicature associated with [+ADD TO]+[+SQA] predicates. The stereotypicality feature wins out: (68)-(70) have more natural punctual readings than durative readings, and the (b) examples in (68)-(70) have only after readings. It is only by overriding the stereotypicality feature of [scratch eyeglasses] with some special, situation-specific information, that we could get both an *after* and duration reading for (68a): *Lupe will scratch her eyeglasses with sandpaper to make them translucent in a few minutes*.

When the basic extent implicature and the stereotypicality feature match, i.e., when the stereotypicality feature is "full physical extent," then, clearly the predicate carries an implicature of full extent affectedness.

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(71)   a. John ate the largest sandwich in the world.
         b. John will eat the largest sandwich in the world in two days.
         (*after* and duration readings)

It is interesting to note that, in example (71), the full-extent, endpoint-inclusive reading of [*eat a sandwich*] defeats specific world knowledge. Item (38), repeated below as (72), demonstrates this.

(72)   Speaker: John ate the largest sandwich in the world.
         Hearer: What?! The whole thing?!

World knowledge and the basic extent implicature both encourage the hearer to interpret [*eat a sandwich*] as involving the full physical extent of the sandwich. This defeats the very natural assumption, specific to the situation of an unbelievably large sandwich, that only a part of the physical extent would be involved.

2.6 Flexible Accomplishments and Degree Achievements

2.6.1 Overview

Degree achievements (Dowty, 1979) are a class of predicates which arguably show many of the characteristics I have attributed to flexible accomplishments. Kennedy & Levin (2008) propose a framework for characterizing the truth conditions and pragmatic interpretations of degree achievement predicates which they suggest will also apply to incremental theme predicates. In this section I consider whether Kennedy & Levin's framework accounts for the behavior of flexible accomplishments.

Dowty (1979) lists as examples of verbs associated with degree achievements: *cool*, *sink*, *age*. Kennedy & Levin's list consists entirely of de-adjectival verbs: *cool*, *fill*, *darken*, *dry*, *deepen*, *empty*, *ripen*, *straighten*, *open*, *close*. Predicates featuring certain of

these verbs are distinctive in being fully acceptable with *for*+time expression adverbials,

regardless of the properties of their arguments (in terms of quantization).

(73)   a. Ray solved the puzzle in/#for a minute.
         b. Ray solved puzzles #in/for hours.

(74)   a. Ray cooled the potato in/for a minute.
         b. Ray cooled potatoes #in/for hours.

Example (73) shows typical behavior for an accomplishment predicate with a quantized

vs. non-quantized argument. The verb *solve*, with a quantized argument, as in (73a), is

acceptable with an *in*+time expression adverbial, but not acceptable with a *for*+time

expression adverbial. By contrast, *solve* with a non-quantized argument, as in (73b) is not

acceptable with an *in*+time expression adverbial but is acceptable with a *for*+time

expression adverbial. For a degree achievement-associated verb like cool, *for*+time

expression adverbials are acceptable whether cool has a quantized argument, as in (74a)

or a non-quantized argument, as in (74b).

Conceptually, what underlies the apparent variable telicity of *cool* is the fact that

it refers to a change of degree on a scale: a theme undergoes the change denoted by *cool*

by going from a lesser to a greater degree of coolness. Two readings of [*cool the potato*]

are available. On one reading, the potato simply becomes cooler at the end of the event

represented by [*cool the potato*] than it was at the beginning; even one degree cooler

suffices. On another reading, the potato cools to a stereotypical or to a contextually-

supplied standard of coolness, cool enough to eat, for example. What is common among

degree achievements is this property of having two available readings, one telic and one

atelic, by contrast with verbs like *solve*, which are associated only with telic predicates.

The term 'achievement' in 'degree achievement' derives from the fact that an

achievement-like instantaneous change from one degree to the next is all that is needed,

strictly speaking, to satisfy the truth conditions of a degree achievement. For example,

[*the ship sank*] is true in (75) if it descended below the level of the sea (by taking on water) by one degrees of level.

(75)   a. The ship sank in 20 minutes.
       b. The ship sank for two minutes until a tug boat came to rescue it.

Example (75a) implies that the ship went entirely below the level of the sea, wile (75b) merely implies a change in the position of the level of the sea with respect to the ship: the line defining sea level is higher with respect to the ship's vertical measure than it was at the beginning of [*the ship sank*].

Given the above facts about degree achievements, their similarity with what I have been calling flexible accomplishments is striking. The endpoint-inclusion inference associated with flexible accomplishments is defeasible and may be relaxed or eliminated by context. Are flexible accomplishments a kind of degree achievement? I will address this question in what follows.

2.6.2 Kennedy & Levin's (2008) framework

Kennedy & Levin (2008) set as their goal a unified account of the variable telicity of members of the three main classes of incremental-change predicates: incremental theme verbs, degree achievements, and directed-motion verbs. As in Hay, Kennedy & Levin (1999), the facts which motivate Kennedy & Levin's analysis are derived from degree achievements, in particular, those associated with de-adjectival verb predicates such as *cool, v ← cool, adj.*; *dry, v ← dry, adj.*; *straighten ← straight*.

Kennedy & Levin propose that de-adjectival verb degree achievements introduce a measure of change functions which are related to the measure functions introduced by their gradable adjectival bases. A measure of change function relates individuals and times to difference measures between initial and final scalar values. For example, a de-

adjectival verb such as *empty* derives its measure of change function from the measure function denoted by its adjectival base. This measure function relates individuals and times to a closed scale with an uppermost value (total emptiness). A container is *empty* iff its degree of emptiness matches this uppermost value. The verb *empty* denotes a measure of change from some degree short of this uppermost value to the uppermost value. Hence *John emptied the bottle* means, by default, that John completely emptied the bottle.

Kennedy and Levin note that the adjectival bases corresponding to de-adjectival verb degree achievements can introduce open or closed scales, and closed scales, can, in turn, be upper or lower scales. To illustrate: *widen* is derived from *wide*, a predicate which introduces an open scale. There is no context-independent maximum degree of wideness, and hence there is no maximum degree to which the verb *widen* can refer lexically. *Widen*, hence, introduces a measure function with respect to an open scale. By contrast, the verb *dry* is derived from the adjective *dry*, which introduces a closed scale. There is a context-independent maximum degree of dryness: a thing is only *dry* when it has no moisture. Hence, the verb *dry* introduces a measure function with respect to a closed scale. Furthermore, this closed scale is an *upper* scale: a thing is only *dry* if it has reached the maximal degree of dryness. A closed scale like that associated with the verb *open* is lower. A thing is *open* if it is only a little *open* (unlike with *dry*: a thing is not *dry* if it is only a little *dry*).

Kennedy and Levin invoke principle to account for how open and closed scales associated with measure of change functions relate to (a)telic interpretations of degree achievement sentences. The principle of Interpretive Economy (p. 14:[18]) states: "Maximize the contribution of the conventional meanings of the elements of a sentence to the computation of its truth conditions." In other words, a predicate lexically associated with a closed scale (conventional meaning) provides an (upper or lower) bound which the

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listener can use as a default in interpreting the extent of the action denoted by the verb. In a sentence like *the workers widened the road*, *widen* is associated with an open scale; there is no maximum value to which the change can be inferred to have progressed in the absence of a contextually-introduced standard because the scale introduced by the adjective *wide* has no conventional maximum value. By contrast, in the sentence *John dried the shirt*, *dry* is associated with a closed, upper scale; there is a maximum value to which the change can be inferred to have progressed in the absence of a contextually-introduced standard because the scale introduced by the adjective *dry* has a conventional maximum value: a total lack of moisture. Hence, if a predicate introduces a measure function associated with a closed upper scale, a hearer, relying on Interpretive Economy, will infer that the action of the verb extends to the maximum degree of this scale. If a predicate introduces a measure function associated with an open upper scale, the hearer will not have an element of conventional meaning (associated with the scale) whose contribution to the truth conditions of the sentence they might maximize. Then they must rely on elements of context in interpreting the extent of the action of the verb along the scale.

2.6.3 Closed and open scales, degree achievements, and incremental themes

One difference between degree achievements and incremental theme predicates--noted by Hay, Kennedy & Levin (1999) and by Kennedy & Levin (2008)--is, as noted above, that the (a)telicity of degree achievements is thought to arise from the semantic properties of the verb (specifically, the boundedness/non-boundedness of the scale projected by the verb), while the (a)telicity of incremental theme predicatess is believed to be related to semantic features of the verb in construction with those of its arguments (Dowty, 1979; Verkuyl, 1993; Tenny, 1994; Krifka, 1998). In both cases, on the view of

Hay, Kennedy & Levin, a scale is projected by the predicate. It is projected directly by the verb in the case of degree achievements, while it is compositionally derived from interacting features of the verb and its arguments in the case of incremental theme predicates. Nonetheless, the scale's being open or closed seems to be crucial for the telicity of the predicate in either case. Kennedy & Levin (2008) do not address incremental theme predicates in detail, pointing to the framework they outline as having a natural applicability to them for future work. It will be good to consider points of comparison and contrast between degree achievements and incremental theme verbs as Kennedy & Levin's framework might apply to the latter.

Kennedy & Levin (2008) confine their linguistic examples almost entirely to de-adjectival verb predicates such as *cool* (as in *the soup cooled*), and *dry* (as in *the shirt dried*). A look at some non-de-adjectival verbs associated with degree achievements provides a point of comparison with incremental theme predicates. Verbs such as *stretch*, *compress*, *extrude,* and *inflate* are non-de-adjectival but predicates headed by these verbs are degree achievements.

(76)   a. Josie stretched the t-shirt.
b. Josie stretched the t-shirt in a few minutes; she was upset, because she just bought it.
c. Josie stretched the t-shirt for a few minutes, left it on the stretching frame, then stretched it some more.

(77)   a. Tess compressed the block of tofu.
b. Tess compressed the block of tofu in 45 seconds. It was ready to cook.
c. Tess compressed the block of tofu for 45 seconds, let some liquid drain out, then applied even more pressure.

(78)   a. The machine extruded a nylon rope.
b. The machine extruded a nylon rope in two minutes.
c. The machine extruded a nylon rope for hours.

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(79)   a. Natalie inflated the giant balloon using her own lung power.
        b. Natalie inflated the giant balloon in three hours using her own lung power.
        c. Natalie inflated the giant balloon for hours using her own lung power.

Items (76)-(79) show non-de-adjectival verb predicates that pattern just like degree achievements in terms of their variable telicity. All of these predicates permit telic and atelic readings. Examples (76b), (77b), (78b), and (79b) show that a contextually-supplied upper bound can be accommodated by the hearer just on the force of the use of *in*+time expression adverbials. However, atelic readings are seen in (76c), (77c), (78c), and (79c). In (76c) and (77c), events are expressed in which the action of stretching and compressing are accomplished to a given degree, temporarily suspended at that degree, and then continued to a greater degree. In (78c) and (79c), accommodation of the durative nature of the event (or, perhaps, in the case of (79c), accommodation of the durative, non-endpoint-inclusive perspective on the event) is easy with *for*+time expression adverbials.

A look at the (a) sentences in (76)-(79) is instructive. In a neutral context, without the support of adverbials, the default meanings of (76a) and (77a) contrast with those of (78a) and (79a). While (78a) and (79a) have clear default telic readings, (76a) and (77a) do not seem to have (to my intuitions) a default reading of maximal change of degree on scales relating to stretching and compression; (76a) does not imply that Josie stretched the t-shirt as far as it could be stretched (before, say, tearing or a cessation of widening took place), and even (76b), representing the clearly telic reading, does not imply this either. Likewise, in (77a), the maximum degree of compression is not implied, and neither is this implied by the clearly telic (76b). This is puzzling, because compression has a natural limit (and stretching may possibly have limits for some objects) and should

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project closed scales, yet their default readings in neutral contexts and even their telic readings fail to reference these natural limits.[34]

Some examples will show contrasting behavior on the part of degree achievement predicates.

(80)   a. Gilbert emptied the jug.
        b. Gilbert emptied the jug in two minutes.
        c. Gilbert emptied the jug for 20 seconds, stopped, and continued to empty it.

(81)   a. Hank dried the shirt.
        b. Hank dried the shirt in a couple of hours.
        c. Hank dried the shirt for a while, then got impatient and put in on still damp.

(82)   a. The workers widened the courtyard.
        b. The workers widened the courtyard in a few days.
        c. The workers widened the courtyard for a few days, and then went on strike.

(83)   a. Phyllis lengthened the scarf.
        b. Phyllis lengthened the scarf in two days.
        c. Phyllis lengthened the scarf for hours until Rose told her it was long enough.

For the most part, the degree achievement predicates in (80)-(83) parallel the behavior of the incremental theme predicates in (76)-(79). They are all compatible with either telic or atelic readings in the right context. However, the (a) examples in (80)-(81), which feature predicates that project closed scales (derived, according to Kennedy & Levin (2008), from the closed scales of their corresponding adjectives) are telic by default. Items (80a) and (81a) have strong default endpoint-inclusive readings, to my intuitions. As expected, (82a)-(83a) have open readings in the neutral context, as the adjectives from which the verbs in these predicates is derived project open scales. For example, (82a) is ambiguous between a reading in which Phyllis completed lengthening of the scarf to a desired

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[34] It is notable that (78a) has a telic reading by default. Although *extrude* clearly projects an open scale, it is not the properties of this scale that the predicate [*extrude a rope*] references, but rather the one derived componentially from the verb and its quantized argument. It is, in this regard, like other verbs of creation.

standard and one in which she merely made the scarf longer, irrespective of any desired standard of length.

The behavior of (81a) and (82a) contrasts with that of their counterpart examples in (76a) and (77a). If the scales projected by the underlying adjectives of degree achievement-associated verbs and those projected by the componential relationship between verbs and their arguments in incremental theme predicates contributed to telicity in the same way, we would not expect to see this contrast in default interpretations. Even when incremental theme predicates project closed scales, as in (76) and (77), they may not have default telic readings. This contrasts with degree achievements, which, as examples (81a)-(83a) suggest, are by default telic in interpretation just in case they project closed scales.

One semantic difference which cross-cuts the class of degree achievements and flexible accomplishments is the issue as to whether the action of the verb is limited by the physical extent of the object represented by its internal argument as opposed to actually modifying the physical extent of the object represented by the internal argument. The verbs *empty*, *dry*, *eat*, *read*, for example, are alike in that their internal argument serves to delimit the action they represent. Actions of emptying, drying, eating, and inflating--as they apply to objects represented by quantized NPs--all terminate when the container is empty, the object has no more moisture, the object has been completely consumed, and the object has been inflated to its limit, respectively. Actions of widening, lengthening, stretching, compressing and extruding which are represented by both degree achievement and incremental theme predicates actually change the physical extent of the objects represented by the internal arguments of their verbs. It is interesting that predicates with the verbs *widen*, *lengthen*, *stretch*, and *compress* (with quantized arguments) all seem to have default atelic readings in neutral contexts, as in (82a), (83a), (76a) and (77a).

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Predicates with the verbs *empty*, *dry*, (as seen in (76a) and (77a)) and *eat* and *read,* as in *Ray ate the sandwich*, and *Ray read a novel*, have default telic readings in neutral contexts.[35] Thus, predicates which modify physical extent, as opposed to being delimited by it, behave differently in terms of their default behavior, and this factor cross-cuts degree achievements and incremental theme predicates.

These considerations raise some questions as to how Kennedy & Levin's framework can be applied to the incremental theme predicates which populate my hypothesized class of flexible accomplishments. It seems that there is some work to be done to determine if this framework can directly account for the types of incremental themes I have considered in this study, or if they constitute a distinct class from degree achievements. A factor for further investigation is the type of change caused by the verb and its relation to the scale projected by verbs and verb constellations. Perhaps it is the case that verbs which modify the physical extent of the objects represented by their internal arguments create open scales which have no natural maximum degree, while those which are delimited by their internal arguments create closed scales (when these arguments are quantized).

3. Distinguishing features of flexible accomplishments

I will conclude this chapter with a brief review, in tabular form, of the criteria and tests which I have proposed to distinguish flexible accomplishments from activities, achievements, and strict accomplishments. Flexible accomplishments are like activities in that they permit atelic readings. They are like strict accomplishments and achievements

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[35] The verb *extrude* seems to behave differently, however, as seen in the default telic reading of (78a) shows. *Extrude* differs from *stretch* and *compress*, however, in that it is a verb of creation. Perhaps it does not denote modifying physical extent, but creating new physical extent.

in that they have available endpoints. They may be distinguished from these lexical aspectual categories on the basis of conceptual/notional criteria and some classical and new tests which have been mentioned in the foregoing chapters and in this one. I summarize these in Table 8 below.

Criterion	Flexible Accomplishments	Strict Accomplishments	Activities	Achievements
Felicitous with *for*+time expressions	Mostly ✓, especially with appropriate context	X	✓	X[36]
Felicitous with *in*+time expressions	✓	✓	X	X[37]
While-coordination relaxes telicity	✓	X	--	X
Felicitous with *Do x, pause, continue to do x.*	✓	X	✓	X
Can be atomic minimal-eventive	✓	X	✓	✓
Stereotypical or real-world endpoint available	✓	✓	X	--

Table 8: Distinguishing features of flexible accomplishments

My conclusion that the endpoint-inclusion readings of flexible accomplishments are conversational implicatures in English is consistent with the observational facts set out in Table 8. That flexible accomplishments are felicitous with *for*+time expressions is consistent with my argument in section 2.2 that the endpoint-inclusion inference associated with flexible accomplishments is a conversational implicature: it can be canceled by continuations that imply non-endpoint-inclusion.

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[36] Excluding the iterative reading.
[37] Excluding the inceptive reading.

The fact that *while*-coordination relaxes the telicity of flexible accomplishments is also consistent with a conversational implicature account. As seen in section 2.2.1, *while*-coordination does not relax telicity for strict accomplishments. While-coordination denotes overlap between events: none of the proper subevents $e' < e$, where e is an event denoted by a strict accomplishment predicate P, count as instances of P. Because the endpoints of a flexible accomplishment predicate P are defeasible, the subevents $e' < e$ do count as instances of P. Thus, in a sentence of the form *A did x while B did y*, if x is a strict accomplishment, the entire run-time of x, including its natural endpoint, must fit inside the run-time of y. If x is a flexible accomplishment, any subevent of x counts as [*A did x*] and only some subinterval of x needs to fit inside the run-time of y.

The fact that atomic minimal-eventive accomplishments are flexible accomplishments is also consistent with an implicature account. The atomic minimal events that comprise predicates like [*eat a sandwich*] and [*sew a dress*] contribute the truth conditions of the complex predicates. For an atomic minimal-eventive predicate P denoting an event e, e is composed of one or more instances of the given atomic minimal event type t. Even one instance e' of type t suffices to make P true. However, the presence of an endpoint in [+ADD TO]+[SQA] predicates, in the form of the extent of the object/path/scale of the [+SQA] NP, makes an implicit, defeasible boundary for the action of the verb.

Chapter 7: Conclusions, Methodology, Future Directions

1. OVERVIEW OF CONCLUSIONS

1.1 Not all [+ADD TO]+[+SQA] predicates entail endpoint inclusion.

I consider the results reported in Chapters 3, 4, and 5 to represent experimental support for Smollett's (2005) claim that [+ADD TO] + [+SQA] clauses are not necessarily telic in their truth conditions. These results, along with the results from traditional tests using varied contexts, as outlined in Ch. 6, strongly suggest that predicates featuring dynamic verbs with quantized arguments do not necessarily entail endpoint inclusion. Simplex [+ADD TO] + [+SQA] clauses (i.e., those consisting solely of a dynamic and a quantized internal argument, with no explicit goal phrase) presented in the non-completed context, were not judged as false across the board by native English speakers or ASL signers. In fact clauses featuring certain verbs were judged as true at a strikingly high rate.

It is notable that all items presented in the non-completed context featuring predicates of consumption and creation were judged as true at a rate much higher than would be expected if dynamic verb/quantized argument predicates were telic by default. Within this class, as discussed in Ch. 6 and summarized in section 1.4 below, items with predicates featuring what I have called the micro-event property were judged as true by an especially large majority of respondents.

1.2 The endpoint-inclusion inference in English is a conversational implicature.

Although a majority of native English-speaking respondents to the experiments described in Chapters 3 and 4 judged sentences featuring certain [+ADD TO] + [+SQA] predicates as true in the non-completed context, a sizeable minority in many cases judged

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them as false. As noted in Chapter 6, many of these types of clause are pragmatically odd when paired with *for*+time expression phrases without some supporting context. A sentence like *Ray ate a sandwich* in isolation strongly suggests endpoint inclusion. When speakers are asked to judge such a sentence in the non-completed context as true or false, however, a clear majority judge it as true. The form of the question forces a focus on truth vs. falsity specifically.

The fact that the majority of respondents answered *true* suggests that the failure of *Ray ate a sandwich* to be an ideal description of a non-completed event is not a barrier to its being true. That a more-than-negligible minority of respondents answered *false* suggests that there is a competition between pragmatic and truth-conditional factors influencing these judgments.

The chief difference between unambiguously telic clauses such as *Ray ate up a sandwich* and a flexibly telic one such as *Ray ate a sandwich* is that the former contains a linguistically overt endpoint marker, *up*. The latter sentence makes an endpoint available, namely, the delimited physical extent of the sandwich, but the lack of an overt endpoint marker renders defeasible the implicature that this endpoint was reached. Some verbs, i.e., strict accomplishment predicates such as *devour*, encode endpoint inclusion as a part of their truth conditions, so that no separate endpoint marker is needed.

As discussed in Chapter 6, section 2.2.2, the endpoint-inclusion reading of predicates which I have classed as flexible accomplishments on the basis of experimental data and classic and new tests is cancelable by continuations which explicitly negate endpoint inclusion. The endpoint-inclusion reading of those which I have classes as strict accomplishments are not similarly cancelable, but result in contradictions. This suggests that flexible accomplishments do not entail endpoint inclusion. This same test suggests that the endpoint-inclusion reading is not a conventional implicature. Flexible

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accomplishment sentences are also felicitous with continuations which reinforce endpoint inclusion; these do not sound redundant as they would if endpoint inclusion were an entailment or conventional implicature. In this same section, I also give evidence that the endpoint-inclusion reading of flexible accomplishments does not project through negation, as would be the case with presupposition.

1.3 Events with the atomic minimal event property are flexible accomplishments; not all flexible accomplishments have the atomic minimal event property.

A minimal-eventive predicate P is one which denotes an event e which consists entirely of discrete sub-events $e_1, e_2, e_3, \ldots e_n$, such that each e_i is a token of a uniform type of event. An eating event is minimal-eventive, as it consists of at least one sub-event comprising the sequence [*bite, chew, swallow*]; likewise, a sewing event consists of one or more instances of a complex minimal event, a *stitch*.

Minimal-eventive accomplishment predicates have salient endpoints when the internal argument of the verb is quantized. In such cases, the path or physical extent of the object denoted by the internal argument forms a scale which induces a telic reading. This telic implicature is defeasible, however--in the absence of a linguistically-overt expression of an endpoint--given that any one instance of the minimal event technically constitutes an instance of the event denoted by the predicate. Thus, all minimal-eventive accomplishments are flexible in the sense that they are compatible with endpoint-inclusive and non-endpoint-inclusive readings.

However, not all accomplishment predicates which permitted non-endpoint-inclusive readings in the experiments described in Chapters 3, 4, and 5 were minimal-eventive. Some items with heterogeneous (Vendler, 1957) predicates, namely those of

creation, such as [*establish a business*], also permitted flexible readings. It may be that the cognitive salience of a partially-created entity that results at the halfway point of such events is influential; it is a type of result. In contrast, nothing at all new is created with a partial [*fix the radio*] event.

1.4 ASL [+ADD TO]+[+SQA] predicates lack the endpoint-inclusion inference due to their explicit iconic reference to atomic minimal events.

The contrast between the results for English, described in section 1.2, above and those for ASL, reported in Chapter 5 and discussed in Chapter 6, is striking in terms of the more categorical judgments of *true* for certain [+ADD TO] + [+SQA] clauses in the non-completed context. Unlike in the English case, for most items in the hypothesized flexible accomplishment class, there was not an appreciable minority of respondents who judged these items as *false*.

The aspectually simple forms (with no reduplication) of dynamic verbs hypothesized to denote flexible accomplishments that were used in the ASL experiment described in Chapter 5, coupled with argument NPs with quantized reference, yielded consistent and near-unanimous judgments of *true* even in clearly non-completed contexts. This is consistent with a lack of an endpoint-inclusion implicature of the kind proposed for the English case as described in Chapter 6 and section 1.3, above.

Aspectually simple ASL clauses featuring predicates such as READ BOOK and DRAW PICTURE consist of relatively short, single-movement citation-form verbs which I argue in Chapter 6 constitute representations of micro-events. These micro-eventive single-movement verbs are often iterated to denote progress through an event with discrete homogeneous states. For a predicate *P* denoting a complex event with a salient

(but not overtly linguistically expressed) endpoint, any event short of that endpoint counts as an instance of *P*, provided it represents a complete micro-eventive subpart of *P*. The minimal-eventive citation form verbs themselves are telic in the sense that they feature the distinctive kinematic signatures associated with telic verbs in ASL described by Wilbur (2003) and Malaia & Wilbur (2010). They are much like semelfactives, in that their stereotypical occurrences are iterative.

1.5 The endpoint-inclusion inference of flexible accomplishments in English is not solely due to stereotypicality effects.

In Chapter 6, section 2.5, I argued against Smollett's (2005) view that the endpoint-inclusion inference associated with [+ADD TO]+[+SQA] predicates in English is due to world knowledge. Smollett's examples involving the relative sizes of the participants in events (*John ate the apple* vs. *The ant ate the apple until it decomposed*) show that world knowledge/stereotypicality effects do play a role in the endpoint-inclusive/exclusive readings of some [+ADD TO]+[+SQA] predicates. However, some examples show that stereotypicality is not the only factor involved in these readings. When the event denoted by a predicate is non-stereotypical, a basic implicature of endpoint inclusion remains. This implicature is based on the hearer's assumption that the full physical extent/path/scale denoted by a [+SQA] NP serves as the bound reached by the action of the [+ADD TO] verb, as shown by examples like *John sanded the watermelon*. Also, some events associated with [+ADD TO]+[+SQA] predicates stereotypically imply non-endpoint-inclusion, such as [*stain the tablecloth*]. When there is a conflict between a stereotypicality effect and the basic implicature of endpoint inclusion, the stereotypicality effect prevails.

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Furthermore, there seems to be a distinction between world knowledge and situational knowledge. *John ate the largest sandwich in the world* is a surprising statement, as it implies that John ate a very large sandwich himself, despite the fact that situational knowledge about the size of the sandwich makes this unlikely. Hearers do not automatically accommodate situational knowledge; rather, [*eat a sandwich*] retains its endpoint-inclusive implicature in the face of situational knowledge.

2. METHODOLOGY

In the process of conducting the experiments for this study, numerous issues and challenges have arisen which it will be valuable at this point to discuss. The initial motivation for conducting these experiments was the apparent discrepancy between the intuitions of many authors in the aspectuality literature and those of other native speakers I consulted informally. Many informally-consulted native speakers dissented from the view that *John ate a sandwich* is false unless John ate the whole sandwich, and likewise for similar examples. There are two basic possibilities for such a discrepancy. Perhaps the native speakers I was consulting were out of touch with their intuitions. When one's attention is consciously focused on a linguistic issue, perhaps one's ways of reasoning through the problem to answer the question at hand have little relation to the way one uses language in a naturalistic context. Another possibility is that linguists who have investigated these issues have developed a consensus on some issues that does not match native speakers' actual competence. As I relate above, I believe that, in fact, a real problem exists with *John ate a sandwich* in the non-completed context, but that it is a problem of infelicity, not with the truth of the sentence. Specifically, listeners know that speakers can convey a non-endpoint-inclusive sandwich eating event with sentences like *John nibbled a sandwich*, *John ate at a sandwich*, *John ate from the sandwich*, etc. If

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listeners assume, in Gricean terms, that speakers are trying to be informative about limits of the action of the verb on the entity represented by its NP argument, the entire physical extent of the object is natural target for this endpoint.

From these considerations, certain desiderata emerged for the experiments in this study. It was desirable that participants' attention not be on the issue of completeness vs. incompleteness. It was desirable that the stimuli that provided the context show a moderate degree of progress toward the endpoint, neither too much nor too little, so that issues of preciseness do not interfere with participants' judgments. It was also desirable that participants focus on the truth of sentences, not their felicity in the given context. Dealing with these three desiderata posed interesting problems and challenges.

2.1 Spontaneity of Judgments

To distract participants from the issue of completeness vs. incompleteness, many distracters were interleaved in a pseudo-random fashion throughout all three experiments. Care was taken to ensure that no one participant saw/read both the completed and non-completed versions of the same scenario. Both of these decisions brought with them problems. Distracters increase the length of time it takes the participant to complete the study. This can lead to boredom and a loss of interest in answering correctly according to one's intuitions. For this reason, and, as mentioned, to keep participants from viewing completed and non-completed versions of the same scenarios, participants were divided up and given separate administration forms. For Experiment One, there were four administration forms: A, B, C, and D. For the ASL experiment and Experiment Two, there were two: A and B. The use of administration forms shortened the length of time any one participant had to spend on task; however, it reduces the total number of

responses to questions in the experiment. Thus, there was a tension between the values of having a large number of responses and having spontaneous, unbiased responses.

It was not the case that the use of distracters totally eliminated conscious attention on the part of participants to completeness vs. incompleteness. Some respondents to Experiment One and the ASL experiment told me that they guessed the relevant issue. Hence, more care was taken in the design of Experiment Two to include more distracters and to make the distracters challenging and visually salient. As outlined in Chapter 4, pre-debriefing comments were required of participants in ELEAS, and respondents were specifically asked what they thought the point of the experiment was. Some--though by no means a large number--did guess this correctly. Many more thought that the vocabulary-memory distraction task was the point of the experiment.

2.2 Video vs. Text

Another challenge faced in the process of these experiments related to the mode of presentation. Video scenarios were used in Experiment One and the ASL experiment, while written scenarios were used in Experiment Two. These each have their pros and cons. Video permits a cross-linguistic stimulus. The native English speakers in Experiment One and the native ASL signers in the ASL experiment viewed exactly the same wordless video scenarios. Video is also arguably less effortful for the participants. They simply have to watch what happens, as opposed to the effort and concentrated attention of reading.

However, the downsides to video are not inconsiderable. Even filming a small set of scenarios was time-consuming and expensive, involving a paid actor, equipment, and props. Editing the videos took much additional time. One of the most daunting problems

was that all this effort must be reproduced if one changes one's mind about certain examples.

Another problem which emerged with video scenarios was the difficulty in conveying to participants exactly what types of judgments are expected of them with regard to certain events. Some questions involve making judgments from appearances about the agent's plans, intentions, or internal states. Because many of the questions seem quite straightforward, in fact, much too easy, participants most likely adopted an especially skeptical stance toward the associated scenarios. For example, just because I see Ray lying in bed with a thermometer in his mouth, a cloth on his head, and tissues and cold medicine on the bedside table does not mean that *Ray was sick* is true. I cannot tell from appearances for sure that he is sick. He may be faking. Similar issues most likely arose in the case of *Ray was sad* and *Ray was studying*, which were both judged as false by a surprisingly high number of participants.

Text eliminates some of these problems. It is very cheap to produce and easy to edit or add to if one changes one's mind about examples. Through the use of an omniscient narrator, the mental states of the agent can be made clear to the participant. There are some drawbacks, however. Reading requires greater attention and effort than viewing a video. Participants may be more likely than with video to quickly scan through a paragraph and not give it their full attention. Care must be taken to ensure that the wording of text scenarios is accessible to the likely pool of participants, since their reading ability and vocabulary knowledge may vary. Additionally, when text is used, the meta-language and the object language are the same. Descriptions of events must not include the actual verb used in the question, or at least not in the tense/aspect form that will be used in the question; a description of the event that avoids the use of these verbs

and their synonyms is best. Finally, the cross-linguistic accessibility of video clearly does not obtain with text.

2.3 The Completeness Factor

A final problem which I suspect may plague experiments of the type I have conducted is a type of bias proper to incremental events of creation. This type of bias seems especially difficult to conquer with distracters, and may embody a natural human cognitive tendency. With predicates of creating, the result of the creative process produces discernable results at every step from beginning to end. The more the object being created resembles the desired end result, the more likely a person is to say that the agent produced this object. This seems like a reasonable way to approach the question of the truth of a statement like *Ray produced a report*, yet it is not, *a priori*, how we want participants to judge linguistic examples. I suspect that this tendency is responsible for many of the items which featured predicates without the atomic minimal event property, such as [*produce a report*], that failed to undergo the true-to-false shift and thus patterned with flexible accomplishments.

3. ASL USERS AND BILINGUALISM ; IMPLICATIONS FOR SIGNED LANGUAGE INTERPRETATION

3.1 ASL Users and Bilingualism

A important and relevant trait of the Deaf subjects in the ASL experiment is their bilingualism. While it is not the typical case that English speakers are bilingual, the overwhelming majority of Deaf signers of ASL are. They are exposed to English via text in many ways: through reading/writing instruction in school, through closed captioning on television programs, and, more recently, via electronic means of communication via e-mail, texting, and the internet. A variety of English-influenced signing has emerged out

of this contact between ASL signers and English known as *contact signing* (Lucas & Valli, 1992). Among the linguistic features of contact signing, Lucas & Valli mention influence from English on syntax, transfer of lexical meaning from English (e.g., the ASL sign RUN being used in the sense of "running for president"), and, most relevantly for this study, the innovation of lexical forms that are phonologically-valid ASL signs, but are not used in ASL. Lucas & Valli mention the sign BECAUSE as an example of this phenomenon; it is not used by Deaf people signing ASL, but exclusively in contact signing situations.

This phenomenon may provide a possible explanation for why there appear to be anomalous strict accomplishment signs in ASL such as MAKE, as noted in Chapter 5.[38] A lexical innovation strategy such as that described by Lucas & Valli might have been operative with MAKE in an earlier phase of ASL's development. Perhaps it was innovated to meet contact signing needs, and over time became accepted as a part of the ASL lexicon. The dearth of available historical data for ASL makes this a challenging but highly interesting issue for further investigation.

3.2 Implications for Signed Language Interpretation

Signed language interpreters are a potential audience for any linguistic work concerning ASL, and my professional training as a sign language interpreter often causes me to look at linguistic issues in ASL with a view to applications for interpretation. I would like to briefly outline some issues this study raises for interpretation.

Hearing interpreters are another potential point of language contact between ASL signers and English, like the ones I mentioned in section 5.1, but in a different, less direct way. English may influence the way interpreters (even native signers) use ASL, and

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[38] BECOME is another possible strict accomplishment sign. I believe that it may, however, be somewhat more restricted to contact signing, similarly to BECAUSE.

indeed, many interpreters are called upon to render their interpretation in contact signing much of the time. The link between interpreters and language contact that induces change in the way that Deaf consumers use ASL is, as far as I am aware, a completely unexplored area and one which needs investigation.

When interpreters are trying to render their interpretation in 'pure' ASL, as opposed to contact signing, often issues are on their minds that reflect their training and exposure to ASL linguistic principles: *Is my syntax ASL-like? Am I using non-manual markers appropriately? Am I structuring information about the sequence of events in a narrative in an ASL-like manner?* More subtle issues, such as what aspectual type verb phrases represent, are often not at the forefront of interpreters' thought processes, and this is most likely because the ASL training that interpreters receive focuses more on syntax, discourse pragmatics, and modality-specific facets of ASL use such as non-manual markers.

One concrete consequence of this is that interpreters--especially non-native signers--may sometimes find themselves mislead by popular glosses for signs. An example is REPAIR (which is also sometimes glossed as FIX), which, as is mentioned in Chapter 5, actually means something more like "tinker with." Clearly, most interpreters know that glosses are inadequate guides to meaning, but it is difficult to be conscious of the specific ways in which they mislead. Interpreters can benefit from observing and analyzing spontaneous signing by Deaf people, especially signing not directed at hearing people, and devoting special attention to issues like lexical meaning. Interpreters, who are in a position to constantly pay attention to the details of language use, are also uniquely well-placed to not only benefit from, but also to contribute to, the insights that linguistics can bring to signed language research. Interpreters who confine their interest in

linguistics only to signed language research may miss opportunities to expand on and apply new ideas gleaned from research on spoken languages to sign, and vice-versa.

4. STRICT ACCOMPLISHMENTS: A GRAMMATICALIZATION CLINE?

As an issue for possible future investigation, I would like to recall some surprising facts that have emerged in the course of this study in connection with the prevalence of strict accomplishments cross-linguistically. As was mentioned in Chapter 2, there is a sense in which strict accomplishments can be seen as the most semantically complex verbal predicates. Strict accomplishments denote events which are temporally extended and have an endpoint, unlike states and activities, which both lack endpoints, and unlike achievements, which have only an endpoint and are not temporally extended. Strict lexical accomplishment predicates alone package temporal extension and endpoint-inclusion into their truth conditions. It would not be surprising, therefore to find that these verbs are typologically somewhat rarer than the other three semantically simpler Vendler classes.

It has been discussed in Chapters 4 that English seems to have a paucity of native Anglo-Saxon roots verbs which are associated with strict lexical accomplishment predicates. Looking at Table 3 in Chapter 4, it is interesting to note that, among the predicates which underwent the true-to-false shift in Experiment Two, i.e., the predicates for which a majority of respondents answered *true* for the completed context and *false* for the non-completed context, the only non-Latinate root is *make*. All of the others are Latinate borrowings: *fix*, *assemble*, *solve*, *create*, etc. Many of the native Anglo-Saxon roots in the class that did not undergo the true-to-false shift can be made strict accomplishments with the use of a particle, such as up: *sew up the hole*, *write up a report*.

It is also quite interesting to note that the only verb in ASL which appeared to be a strict accomplishment on the basis of the true-to-false shift, as noted in Chapter 5, was MAKE. In order to form all other accomplishments in ASL, it is necessary, as best as I am able to determine, to use some type of endpoint particle in conjunction with the verb, such as the result-state markers (RSMs) mentioned in Chapter 5.

There is a cross-linguistically widely-attested strategy for creating strict accomplishments out of non-accomplishments with the use of endpoint particles such as English *up* in *write up*, *out* in *clean out*, ASL *DRAIN* and *NOT-A-TRACE*. Particles are used in a similar way in Mandarin, Hindi, and other languages (Koenig & Chief, 2008; Arunchalam & Kotari, 2011). Perhaps this use of endpoint particles is the beginning point of a grammaticalization cline (Hopper & Traugott, 2003[1993]) by which particles and prepositions bring their semantic contributions related to endpoints into composition with that of the verb first as free morphemes, and later, over time as bound morphemes associated with lexical roots.[39] Such a process may be visible in the etymologies of some of the Latin verbs associated with strict accomplishments borrowed into English: Latin: *ad-simulare* → Med. Latin *assimulare* → Old Fr. *assembler* → *assemble*[40]; Med. Latin *in-stallare* → Old Fr. *installer* → *install*.[41] In these two examples, Latin prepositions *ad* and *in* brought their endpoint/location semantic contributions to their collocations with

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[39] In other cases, however, adjective-derived end-state lexicalization seems to have been operative. English *fix* ←Lat. *fixus* (to fix, fasten); "fix, v.". OED Online. December 2013. Oxford University Press. 27 February 2014 <http://www.oed.com.ezproxy.lib.utexas.edu/view/Entry/70815?rskey=5wno6A&result=3&isAdvanced=false>.

[40] "assemble, v.1". OED Online. December 2013. Oxford University Press. 27 February 2014 <http://www.oed.com.ezproxy.lib.utexas.edu/view/Entry/11787?rskey=gddWxn&result=2&isAdvanced=false>.

[41] "install, v.1". OED Online. December 2013. Oxford University Press. 27 February 2014 http://www.oed.com.ezproxy.lib.utexas.edu/view/Entry/97023?rskey=RTHrim&result=2&isAdvanced=false.

roots. The multi-morphemic nature of these sources is most likely opaque to modern English speakers.

These issues raise interesting questions relating to the origin and cross-linguistic prevalence of strict accomplishments. Is there evidence for a cline of grammaticalization such that strict accomplishments are derived from atelic, activity-associated verbs in collocation with particles/prepositions which become multi-morphemic lexical items over time? Typological considerations also arise. Are there genetic or areal tendencies with regard to the prevalence of mono-morphemic strict accomplishments like English *make* and ASL MAKE vs. bi-morphemic vs. periphrastic strict accomplishments? Further research along these lines could yield valuable insights.

Appendix A

Experiment One Video Scenes, Sentence Prompts, and Questions

After each of the fourteen scenes in each form, the participant was asked questions of the following form:

Is this sentence true or false?: Ray drew a picture.   [ ] True   [ ] False

Each scene was followed by one question pertaining to the research questions of the study and one distracter question.

Form A
1. EAT A SANDWICH (complete)
Ray ate a sandwich.
Ray was drinking a Pepsi. (false)

2. TYPING
Ray used an Apple laptop. (true)
Ray typed.

3. BREAK THE CRACKER (incomplete)
The cracker was round. (false)
Ray broke the cracker.

4. STANDING
Ray was standing.
Ray was near a table. (true)

5. DRAW A PICTURE (incomplete)
Ray used a marker. (true)
Ray drew a picture.

6. SAD
Ray used his cellphone. (false)
Ray was sad.

7. FIND A BOOK (complete)
Ray found a book.
Ray picked up several items. (true)

8. WRITE A STORY (incomplete)

Ray wrote a story.
Ray wore a gray shirt. (true)

9. SIT DOWN (complete)
Ray played with his watch. (false)
Ray sat down.

10. MAKE A BOX (complete)
Ray used a stapler. (false)
Ray made a box.

11. READ A BOOK (incomplete)
Ray read a book.
The chair had a striped pattern. (true)

12. WALKING
Ray walked.
Ray wore shorts. (false)

13. CATCH A MOUSE (incomplete)
Ray was wearing a baseball cap. (false)
Ray caught a mouse.

14. FIX THE TV (complete)
Ray fixed the TV.
Ray's TV had a rabbit-ears antenna. (true)

FORM B

1. SIT DOWN (incomplete)
Ray played with his watch. (false)
Ray sat down.

2. FIND THE BOOK (complete)
Ray found the book.
Ray picked up several items. (true)

3. MAKE A BOX (complete)
Ray made a box.
Ray used tape. (true)

4. WIPE THE TABLE
Ray wiped the table.

Ray used a spray bottle. (false)

5. DRAW A PICTURE (complete)
Ray used lined paper. (false)
Ray drew a picture.

6. WRITE A STORY (incomplete)
Ray wore a gray shirt. (true)
Ray wrote a story.

7. SITTING
Ray looked around the room. (false)
Ray was sitting.

8. STANDING
Ray's hands were in his pockets. (false)
Ray was standing.

9. FIX THE TV (incomplete)
Ray fixed the TV.
Ray's TV had a rabbit-ears antenna. (true)

10. READ A BOOK (incomplete)
Ray read a book.
Ray was wearing glasses. (false)

11. WALKING
Ray wore blue jeans and white shoes. (false)
Ray walked.

12. EAT A SANDWICH (complete)
Ray ate a sandwich.
Ray was drinking a Pepsi. (false)

13. BREAK THE CRACKER (complete)
The cracker was on a round plate. (true)
Ray broke the cracker.

14. CATCH A MOUSE (complete)
Ray caught a mouse.
The mouse was on the sidewalk. (true)

FORM C

1. SIT DOWN (complete)
Ray played with his watch. (false)
Ray sat down.

2. TYPING
Ray typed.
Ray used an Apple laptop. (true)

3. EAT A SANDWICH (incomplete)
Ray was drinking a Pepsi. (false)
Ray ate a sandwich.

4. WRITE A STORY (complete)
Ray wore a gray shirt. (true)
Ray wrote a story.

5. SICK
There was a box of tissues on the small table beside the bed. (true)
Ray was sick.

6. STANDING
Ray was standing.
Ray's hands were in his pockets. (false)

7. CATCH THE MOUSE (complete)
The mouse was on the sidewalk. (true)
Ray caught the mouse.

8. READ A BOOK (complete)
Ray read a book.
The chair had a striped pattern. (true)

9. DRAW A PICTURE (complete)
Ray used lined paper. (false)
Ray drew a picture.

10. STUDYING
Ray studied.
Ray had a Biology book. (false)

11. BREAK THE CRACKER (incomplete)
The cracker was on a round plate. (true)
Ray broke the cracker.

12. MAKE A BOX (incomplete)
Ray made a box.
Ray used a stapler.(false)

13. FIND A BOOK (complete)
Ray found a book.
Ray picked up several items. (true)

14. FIX THE TV (incomplete)
Ray fixed the TV.
Ray opened up the remote and changed the batteries. (false)

FORM D

1. SICK
Ray was sick.
There was a box of tissues on the small table beside the bed. (true)

2. READ THE BOOK (complete)
Ray read the book.
Ray was wearing glasses. (false)

3. WRITE A STORY (complete)
Ray wrote a story.
There was a tablecloth on the table. (false)

4. FIND THE BOOK (complete)
Ray found the book.
Ray opened a closet. (false)

5. TYPING
Ray used a Dell laptop. (false)
Ray typed.

6. SAD
Ray was sad.
Ray used his cellphone. (false)

7. FIX THE TV (complete)
Ray's TV had a rabbit-ears antenna. (true)
Ray fixed the TV.

8. DRAW A PICTURE (incomplete)
Ray drew a picture.
Ray used a marker. (true)

9. CATCH THE MOUSE (incomplete)
The mouse was on the sidewalk.
Ray caught the mouse.

10. STUDYING
There was a calculator on the desk. (true)
Ray studied.

11. BREAK THE CRACKER (complete)
The cracker was round. (false)
Ray broke the cracker.

12. EAT A SANDWICH (incomplete)
Ray ate a sandwich.
The paper plate had a flower pattern. (true)

13. MAKE A BOX (incomplete)
Ray used a stapler. (false)
Ray made a box.

14. SIT DOWN (incomplete)
Ray looked off to one side. (true)
Ray sat dow

Appendix B

Experiment One Response Data

Participant ID	form	walk	sick	draw a picture i	draw a picture c	catch a mouse i	catch a mouse c	eat a sandwich i	eat a sandwich c	break the cracker i	break the cracker c
72	--	--	NS	NS	--	F	--	T	--	--	T
73	--	--	T	--	T	--	T	NS	--	F	--
71	--	T	--	--	T	--	T	--	T	--	T
74	--	T	--	T	--	F	--	--	T	F	--
75	--	--	T	--	T	--	T	T	--	F	--
76	--	T	--	--	T	--	F	--	T	--	T
77	--	T	--	T	--	F	--	--	T	F	--
78	--	T	--	T	--	F	--	--	T	F	--
79	--	--	T	T	--	F	--	T	--	--	T
80	--	--	T	--	--	--	T	T	--	--	--
81	--	T	--	T	--	F	--	--	T	F	--
82	--	--	T	T	--	F	--	T	--	--	T
83	--	--		--	T	--			--	F	--
84	--	--	T	--	T	--	T	T	--	F	--
85	--	T	--	--	T	--	F	--	T	--	T
86	--	--	T	--	T	--	T	T	--	F	--
87	--	T	--	T	--	F	--	--	T	F	--
88	--	--	NS	--	T	--	T	F	--	F	--

Table 9: Experiment One Response Data

Participant ID	write a story i	write a story c	type	fixed the TV i	fixed the TV c	make a box i	make a box c	found a/the book c	read the book i	read a/the book c	study	sad
72	--	NS	T	--	NS	F	--	T	--	NS	NS	NS
73	--	T	NS	F	--	F	--	F	--	T	NS	--
71	T	--	--	F	--	--	T	T	T	--	--	--
74	T	--	T	--	T	--	T	T	T	--	--	T
75	--	T	T	F	--	F	--	T	--	T	NS	--
76	F	--	--	F	--	--	T	T	F	--	--	--
77	T	--	T	--	T	--	T	T	T	--	--	T
78	T	--	T	--	T	--	T	T	T	--	--	T
79	--	T	T	--	T	F	--	T	--	T	T	T
80	--	T	T	--	--	--	--	--	--	T	--	--
81	NS	--	T	--	NS	--	T	T	F	--	--	NS
82	--	T	T	--	T	F	--	T	--	F	T	NS
83	--			F	--	F	--	T	--		T	--
84	--	T	T	F	--	F	--	T	--	T	F	--
85	F	--	--	F	--	--	T	T	F	--	--	--
86	--	T	T	F	--	F	--	T	--	T	T	--
87	F	--	T	--	T	--	T	T	T	--	--	T
88	--	NS	T	F	--	F	--	T	--	T	NS	--

Table 9: cont.

Participant ID	Pepsi f	round plate t/cracker round f	round plate t/cracker round f	gray shirt t	gray shirt t/tablecloth f	Apple t/Dell f	change batteries f	rabbit-ears t	stapler f	tape t/stapler f	pick up items t/closet f	stipes t/glasses f
72	--	--	F	--	F	T	--	T	F	--	F	--
73	--	T	--	--	NS	NS	F	--	F	--	NS	--
71	F	--	T	NS	--	--	T	--	--	T	F	F
74	F	F	--	T	--	T	--	T	--	F	T	T
75	--	T	--	--	NS	T	F	--	F	--	T	--
76	F	--	NS	F	--	--	T	--	--	T	T	F
77	F	F	--	T	--	T	--	T	--	F	F	NS
78	F	F	--	T	--	NS	--	F	--	F	T	NS
79	--	--	F	--	NS	F	--	T	F	--	F	--
80	--	--	--	--	NS	T	--	--	--	--	--	--
81	F	F	--	NS	--	T	--	T	--	F	T	T
82	--	--	F	--	F	NS	--	T	F	--	F	--
83	--	T	--	--			F	--	F	--	T	--
84	--	T	--	--	NS	T	F	--	F	--	F	--
85	F	--	T	T	--	--	T	--	--	T	T	F
86	--	T	--	--	T	T	F	--	F	--	T	--
87	F	F	--	T	--	T	--	T	--	F	F	T
88	--	T	--	--	NS	T	F	--	F	--	T	--

Table 9: cont.

Participant ID	sitting	standing	sit down i	sit down i	wipe the table	blue jeans & white shoes	box tissues t	use marker t	lined paper f	mouse on sidewalk t/baseball cap f	mouse on sidewalk t	flower pattern t/Pepsi f
72	--	--	--	--	--	--	T	T	--	T	--	T
73	--	T	--	T	--	--	NS	--	F	--	T	F
71	T	T	F	--	T	NS	--	--	NS	--	T	--
74	--	T	--	T	--	F	--	T	--	F	--	--
75	--	T	--	T	--	--	T	--	F	--	T	F
76	T	T	F	--	T	NS	--	--	F	--	T	--
77	--	T	--	T	--	F	--	T	--	F	--	--
78	--	T	--	T	--	F	--	T	--	F	--	--
79	--	--	F	--	--	--	NS	T	--	T	--	T
80	--	T	--	T	--	--	NS	--	--	--	T	F
81	--	T	--	T	--	F	--	NS	--	F	--	--
82	--	--	T	--	--	--	NS	T	--	T	--	NS
83	--		--		--	--		--	F	--		
84	--	T	--	T	--	--	F	--	F	--	T	F
85	T	T	F	--	T	T	--	--	F	--	T	--
86	--	T	--	T	--	--	NS	--	F	--	T	F
87	--	T	--	T	--	F	--	T	--	F	--	--
88	--	T	--	T	--	--	NS	--	F	--	T	F

Table 9: cont.

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Participant ID	stipes t/glasses f	calculator t/biology book f	cellphone f	rabbit-ears t/look around f	hands in pockets f	look off t/play w. watch f	play w. watch f	spray bottle f
72	F	T	F	--	--	--	--	--
73	NS	F	--	--	F	--	F	--
71	--	--	--	F	F	F	--	F
74	--	--	F	--	--	--	F	--
75	T	NS	--	--	F	--	F	--
76	--	--	--	F	F	F	--	F
77	--	--	F	--	--	--	F	--
78	--	--	F	--	--	--	F	--
79	NS	T	F	--	--	NS	--	--
80	NS	--	--	--	F	--	F	--
81	--	--	NS	--	--	--	F	--
82	F	T	NS	--	--	NS	--	--
83		F	--	--		--		--
84	T	F	--	--	F	--	F	--
85	--	--	--	NS	F	F	--	F
86	NS	F	--	--	F	--	F	--
87	--	--	F	--	--	--	F	--
88	NS	NS	--	--	F	--	F	--

Table 9: cont.

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Appendix C

Experiment Two Text Scenarios, Sentence Prompts, and Questions

1. SCENARIOS AND SENTENCE PROMPTS:

(1) SEW a dress

Gloria saw a pattern for a dress she really wanted for her daughter. She bought the pattern and fabric and took them home. She cut out the parts of the dress according to the pattern, and then got out her sewing machine. She sewed together the various parts of the dress. She attached the collar and the fringe on the sleeves and the hemline. Her daughter wore the dress to her first day of school.

Gloria saw a pattern for a dress she really wanted for her daughter. She bought the pattern and fabric and took them home. She cut out the parts of the dress according to the pattern, and then got out her sewing machine. She began sewing together the various parts of the dress. When she got to the sleeves, she realized that she had looked at the wrong numbers on the sizing chart when she cut the parts out. The dress would be much too small for her daughter. She gave the all the pieces to her neighbor to finish for her own daughter.

Research Question: Gloria sewed a dress.
True distracter: Gloria bought textiles.
False distracter: Gloria forgot to buy textiles.

(2) PEEL an orange

Rachael selected an orange from a bowl of fruit. Using her thumb and forefinger, she removed a small piece of the skin of the orange to make an opening, and then she began removing the rest of the skin piece by piece. It took her around a minute to remove all the skin from the orange.

Rachael selected orange from a bowl of fruit. Using her thumb and forefinger, she removed a small piece of the skin of the orange to make an opening, and then she began removing the skin piece by piece. When she had removed about half of the orange's skin, she suddenly sneezed on it. She knew couldn't serve it to anyone after that, so she threw it away.

Research Question: Rachael peeled an orange
True distracter: What Rachael selected was a citrus.
False distracter: What Rachael selected wasn't a citrus.

(3) pan of water EVAPORATE

Leah's science teacher gave her an assignment. She told her to place an aluminum pan on a shelf in the back of the classroom and fill it to the top with water. Then she told Leah to measure the level of the water with a ruler every day and write down the measurement. After two days, the water was down by a few millimeters. After three more days, Leah, checked the pan, and it was completely dry. No one had disturbed the pan of or removed any water from it during this time.

Leah's science teacher gave her an assignment. She told her to place an aluminum pan on a shelf in the back of the classroom and fill it to the top with water. Then she told Leah to measure the level of the water with a ruler every day and write down the measurement. After two days, the water was down by a few millimeters. After three more days, Leah, checked the pan, and it had three millimeters of water left. No one had disturbed the pan or removed any water from it during this time.

Research Question: A pan of water evaporated.
True distracter: Leah's teacher assigned her a task.
False distracter: Leah's teacher didn't assign her a task.

(4) ice MELT

A large block of ice was delivered to a hotel to be made into an ice sculpture for a wedding reception. The careless delivery boy left it in the kitchen late in the evening, thinking that someone from the kitchen staff would put it in the freezer until it was needed. By the time the staff arrived the following morning, there was nothing left but a large puddle of water.

A large block of ice was delivered to a hotel to be made into an ice sculpture for a wedding reception. The careless delivery boy left it in the kitchen late in the evening, thinking that someone from the kitchen staff would put it in the freezer until it was needed. By the time the staff arrived the following morning, they found a block half the original size in puddle of water.

Research Question: A block of ice melted.
True distracter: The ice was transported to the lodging place.
False distracter: The ice was not transported to the lodging place.

(5) WRITE a story

Brendan had a great idea for a story about a baby dragon. He thought he would enter it

into a short story writing contest. He sat down at his computer and began to write. He told of how the baby dragon was adopted by a kindly knight. He told of how he learned to fly and roast marshmallows with his breath. He wrote of how the dragon grew into adulthood and one day saved the life of the kindly knight. Brendan was very satisfied with his work as sent the tale to the contest committee.

Brendan had a great idea for a story about a baby dragon. He thought he would enter it into a short story writing contest. He sat down at his computer and began to write. He told of how the baby dragon was adopted by a kindly knight. He told of how he learned to fly and roast marshmallows with his breath. Brendan couldn't figure out what to write next. He wrote about the dragon's first battle, but then erased that and wrote about the dragon's first sea voyage. Nothing seemed right. Brendan ended up erasing the whole thing from his computer.

Research Question: Brendan wrote a story.
True distracter: The plot Brendan conceived was a fantasy.
False distracter: The plot Brendan conceived was not a fantasy.

(6) PAINT the barn

Keane was a farmer. He had a barn that had never been painted, and he saw that the weather was taking its toll on it. He bought several buckets of green paint and got to work. He worked for two days with a large brush, covering each wall of the barn with two coats of green paint. On the third and fourth days, he gave the doors two coats of paint each. His barn looked much better afterwards, and didn't need painting again for many more years.

Keane was a farmer. He had a barn that had never been painted, and he saw that the weather was taking its toll on it. He bought several buckets of green paint and got to work. He worked for two days with a large brush, covering two of the four walls of the barn with two coats of green paint. Keane then had to stop for a couple of days because of some other work he had to do. A late spring snow storm after that prevented him for continuing the paint job. By the time he could have started painting again, there was no time because planting season had begun. His half-painted barn stayed that way until one day lightning struck the barn and it burned to the ground.

Research Question: Keane painted a barn.
True distracter: Keane was concerned about the effects of the elements on a piece of his property.
False distracter: Keane was unconcerned about the effects of the elements on a piece of his property.

(7) KNIT a blanket

Tess took a ball of yarn and her knitting needles and began to knit. She wanted to make a small blanket for the baby girl her sister was expecting. She sat all afternoon on Tuesday and knitted until it was time for dinner. Over the next three afternoons, she knitted away. She added the finishing touches on Friday, and gave it to her sister that evening.

Tess took a ball of yarn and her knitting needles and began to knit. She wanted to make a small blanket for her baby niece. She sat all afternoon on Tuesday and knitted until it was time for dinner. The next afternoon, she knitted in the morning. She thought she could be done by Friday afternoon. On Friday morning, she came into the living room to find the cat unraveling the yarn into a tangled frenzy. She threw the whole thing away, and decided to buy her sister a gift card instead.

Research Question: Tess knitted a blanket.
True distracter: Tess was proficient at a kneedlecraft.
True distracter: Tess was not proficient at a kneedlecraft.

(8) EAT a sandwich

Daniel went to the cafeteria to get a sandwich. It was a large turkey sandwich with tomatoes, lettuce, cheese and mayonnaise. He savored the sandwich slowly, taking medium-sized bites. After consuming about two-thirds of the sandwich, he got up to get a soft drink. He returned and began eating more quickly, as his lunch hour was almost over. He consumed the remainder of the sandwich until he was left with an empty plate. He drank his soft drink on the way back to his office.

Daniel went to the cafeteria to get a sandwich. It was a large turkey sandwich with tomatoes, lettuce, cheese and mayonnaise. He savored the sandwich slowly, taking medium-sized bites. After consuming about two-thirds of the sandwich, he got up to get a soft drink. He returned and and found several flies perched on his sandwich. Daniel was disgusted and didn't want to eat any more, and his lunch hour was
almost over. He threw the remainder of the sandwich in the trash. He drank his soft drink on the way back to his office.

Research Question: Daniel ate a sandwich.
True distracter: Daniel was ingesting a comestible item.
False distracter: Daniel was not ingesting a comestible item.

(9) DRINK a cup of coffee

Leslie stopped off at a coffee shop on her way to work. She liked to have a cup before

starting her day. She ordered a medium, black coffee and sat down to enjoy it. It was hot, so she took small sips as she let it cool. After a few minutes, it was cool enough to drink more quickly. When there was a little under half of the coffee left in the cup, she paused to send a text message to a co-worker. She looked at the time, and saw that she had to get to work. She finished the rest of the coffee and left the empty cup on the table.

Leslie stopped off at a coffee shop on her way to work. She liked to have a cup before starting her day. She ordered a medium, black coffee and sat down to enjoy it. It was hot, so she took small sips as she let it cool. After a few minutes, it was cool enough to drink more quickly. When there was a little under half of the coffee left in the cup, she paused to send a text message to a co-worker. She looked at the time, and saw that she had to get to work, and that the coffee was now cold. She left the rest of the coffee in the cup on the table, and hurried off to her car.

Research Question: Leslie drank a cup of coffee.
True distracter: Leslie was on her way to a place of employment.
False distracter: Leslie was not on her way to a place of employment.

(10) READ a book

Vance's friend told him about a new, best-selling science fiction book that sounded really interesting. Vance picked up a copy of "The Venusian Venture" at a local bookstore. He noticed it was about 300 pages long. He got home early in the afternoon and started reading it. It was so exciting that he couldn't put it down. He only stopped long enough to get something for dinner--when he was a little over half-way through the book--and then went back to reading right away. Vance thought the ending was a little bit of a let-down, but he really like it overall.

Vance's friend told him about a new, best-selling science fiction book that sounded really interesting. Vance picked up a copy of "The Venusian Venture" at a local bookstore. He noticed it was about 300 pages long. He got home early in the afternoon and started reading it. It actually found it rather dull, but he had paid for it, so he kept reading. He stopped to get something for dinner when he was a little over half-way through the book. After dinner he felt sleepy, and not very interested in the book. He put the book on his bookcase and took a nap. He forgot about completely until he found it months later and gave it to his brother as a birthday present.

Research Question: Vance read a book.
True distracter: "The Venusian Venture" was a novel in the sci-fi genre.
False distracter: "The Venusian Venture" wasn't a novel in the sci-fi genre.

(11) BUILD a house

Jake really enjoyed do-it-yourself projects. His dream was to live in a house he designed and constructed himself. He drew up the plans for his house on his computer. He bought all the hardware he would need, including wood and shingles. He laid the foundation and the plumbing, framed up the walls, and then the roof, and then he did all the electrical wiring. He had to stop for a few days at one point because of bad weather, but he started back again right after that. He finished the exterior next, and then the interior, with carpeting and wallpaper. He was ready to move in after only six months of work.

Jake really enjoyed do-it-yourself projects. His dream was to live in a house he designed and constructed himself. He drew up the plans for his house on his computer. He bought all the hardware he would need, including wood and shingles. He laid the foundation and the plumbing, framed up the walls, and then the roof, and then he did all the electrical wiring. He had to stop for a few days at one point because of bad weather. The weather kept getting worse. Finally, flooding forced him to abandon the project. It was not insured, and he left the project the way it was when the land was repossessed.

Research Question: Jake built a house.
True distracter: Jake was adept at carpentry.
False distracter: Jake was inept at carpentry.

(12) FIX the radio

Natalie's radio stopped working. When she tried to turn it on, there was no volume, until suddenly, when she turned it way up, it was blaring. She didn't want to buy a new one, because she really liked
this one, and she also didn't want to spend money on a new radio. Fortunately, she had taken a few basic electronics classes in college and had successfully repaired a few devices before. She began taking the radio apart. She replaced the speaker wires, but this didn't solve the problem. Then she attached the speakers to another radio, and they worked fine, so that wasn't the problem either. Finally she took apart the knob assembly for the "on" switch. She found that there was a rubber ring that had broken inside it. She replaced the knob, re-assembled the radio, and it worked fine.

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this one, and she also didn't want to spend money on a new radio. Fortunately, she had taken a few basic electronics classes in college and had successfully repaired a few devices before. She began taking the radio apart. She replaced the speaker wires, but this didn't solve the problem. Then she attached the speakers to another radio, and they worked fine, so that wasn't the problem either. Finally she took apart the knob assembly for the "on" switch. She found that there was a rubber ring that had broken inside it. She

replaced the knob, re-assembled the radio, but it still didn't work.

Research Question: Natalie fixed a radio.
True distracter: At the beginning of this scnerario, the apparatus was malfunctioning.
False distracter: At the beginning of this scenario, the apparatus was not malfunctioning.

(13) SOLVE a problem

Melanie was a manager at a coffee shop. She had a real problem on her hands. Two of her employees, Russ and Carol were always fighting. Russ complained that Carol was always late. Carol complained that Russ was too chatty with customers, making others wait too long in line, and that while he came in on time, he left early almost every day. Melanie sat down with the separately to get each person's side of the story. She also put in a call to her supervisor at corporate headquarters to get advice. Then she sat down with them together and had a long meeting. After some bickering, Carol and Russ finally both agreed they could both improve their own work. They've been getting along a lot better since then. Russ has been staying his full time at work, as well as getting the line to move more efficiently. Carol hasn't been late for work at since the meeting.

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Research Question: Melanie solved a problem.
True distracter: At the beginning of the scenario, there was a discordant relationship between two employees.
False distracter: At the beginning of the scenario, there was consensus between the employees.

(14) CREATE a report

Norman's boss told him to prepare a report with all of the company's sales data for the quarter ending March 31. He e-mailed each individual salesperson and got everyone's sales figures. He opened up the spreadsheet program on his computer and started entering figures. He took a break at noon and ate lunch at his desk. He resumed entering figures at

12:30 and had all his data entered in the spreadsheet by 4:00 pm. He then figured out the formulas he needed to insert into the rows at the bottoms of the columns. He double-checked that the calculations made sense, and submitted them to his boss.

Norman's boss told him to prepare a report with all of the company's sales data for the quarter ending March 31. He e-mailed each individual salesperson and got everyone's sales figures. He opened up the spreadsheet program on his computer and started entering figures. After about an hour, he had about half the data entered. At that point, Norman lost interest in this task and began playing computer solitaire. He was still doing this at 5:00 pm when a co-worker told him their boss had been suddenly fired. Norman left for the day.

Research Question: Norman created a report.
True distracter: Norman's superior directed him to format some statistics.
False distracter: Norman's subordinate didn't direct him to format some statistics.

(15) CONVINCE someone to do x

Eric really wanted to go to Mardi Gras in New Orleans with his girlfriend, Dora. He suggested the idea to her, but she was resistant. Dora pointed out that she needed to study for mid-terms, and she really wasn't that into the party scene. Eric told her that he would do all the driving, so she would have hours on the road to study. He also pointed out that there was more to New Orleans than just the party scene. There was a lot of interesting history to the city and plenty of cool things to see during the day. In the end, Dora decided to go with Eric to Mardi Gras.

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Research Question: Eric convinced Dora to go to New Orleans.
True distracter: At the beginning of the scenario, Dora was reticent to comply with Eric's wishes.
False distracter: At the beginning of the scenario, Dora was enthusiastic to comply with Eric's wishes.

(16) DEVISE a plan

Mr. Thomas, the mayor of Springfield, had big political dreams. He wanted to be President of the United States one day. He tried to think of a plan to make this happen, which he knew would take years. He thought he would start by becoming a state senator. He would try to get to know as many fellow politicians and business people as possible, do favors for them, and count on their future support. Then he would run for the U.S. Senate. Then he thought he would make his bid for President and call in all his favors. He was sure he could make it happen.

Mr. Thomas, the mayor of Springfield, had big political dreams. He wanted to be President of the United States one day. He tried to think of a plan to make this happen, which he knew would take years. He thought he would start by becoming a state senator. He would try to get to know as many fellow politicians and business people as possible, do favors for them, and count on their future support. However, Mr. Thomas wasn't sure if he should run for state Governor next, or run for the U.S. Senate. Also, he couldn't decide if getting to know industry lobbyists or environmental lobbyists would be more beneficial for his chances.

Research Question: Mr. Thomas devised a plan.
True distracter: Mr. Thomas was an ambitious bureaucrat.
False distracter: Mr. Thomas was a humble and unambitious bureaucrat.

(17) ASSEMBLE a telescope

Lucy bought a do-it-yourself telescope kit online. She was excited when it arrived in the mail a few days later. She opened the box and took out all the pieces. She read through the instructions, following
them step by step. Lucy started by putting the black matte paper inside the tube to prevent glare. She attached the large lens at one end of the tube, and then put in the eyepiece at the other end. She attached the focus knob assembly. Then she screwed on the bracket for the viewfinder and put the viewfinder in its correct place. She had a lot of fun that evening looking at the moon and stars.

Lucy bought a do-it-yourself telescope kit online. She was excited when it arrived in the mail a few days later. She opened the box and took out all the pieces. She read through the instructions, following
them step by step. Lucy started by putting the black matte paper inside the tube to prevent glare. She attached the large lens at one end of the tube, and then put in the eyepiece at the other end. She tried attached the focus knob assembly, but something wasn't right. The screws too small and it kept falling off. She also tried to screw on the bracket for the viewfinder, but these screws were too large, and she couldn't make them fit. Lucy sent

the kit back for a refund.

Research Question: Lucy assembled a telescope.
True distracter: At the beginning of the scenario, Lucy was enthusiastic about a scientific contraption.
False distracter: At the beginning of the scenario, Lucy was apathetic about a scientific contraption.

(18) INSTALL a program

Martina wanted to install a special photo editing program on her desktop computer. The program was very large, and came on two DVDs. She inserted the first DVD into her computer's drive. She answered the installation questions, and waited for several minutes. Soon she was prompted to install the second DVD, which she did, and hit 'Enter.' After a few minutes, she was prompted to enter some final settings, which she did. She spent some time that afternoon playing around with the software and learning to use it. She found it very user-friendly.

Martina wanted to install a special photo editing program on her desktop computer. The program was very large, and came on two DVDs. She inserted the first DVD into her computer's drive. She answered the installation questions, and waited for several minutes. Soon she was prompted to install the second DVD, which she did, and hit 'Enter.' After a several minutes, it seemed like nothing had happened. She
looked at the installation status bar, which said "78%." Later, after two hours, the status bar still said "78%." She removed the DVD from the drive and decided to look for something more reliable.

Research Question: Martina installed a program.
True distracter: Martina wanted to have special software on her computer.
False distracter: Martina wanted to have special hardware on her computer.

(19) MAKE a hat

Erin didn't like any of the hats she saw in stores, so she bought some fabric and got to work. She cut out a pattern that she got from a craft book and began sewing the pieces together. After sewing the basic form, she added some flowers and some embroidery. She was pleased with the result, which fit her perfectly. She wore the hat to a dinner party, and no one realized it was home-made.

Erin didn't like any of the hats she saw in stores, so she bought some fabric and got to work. She cut out a pattern that she got from a craft book and began sewing the pieces together. After sewing most of the basic form, she became a little confused. The

remaining two pieces didn't seem to fit anywhere. Also, her hands had become sore from hand sewing. She gave up on using it as a hat, and instead put in on her nightstand where she used it to collect loose change.

Research Question: Erin made a hat.
True distracter: Erin was dabbling in millinery.
False distracter: Erin bought the finished merchandise of a professional milliner.

(20) ESTABLISH a business

Sharon wanted to open a store to sell used computers. She found a location that she could afford and signed a lease for the building. She hired a staff of salespeople. She took out ads on television and radio to let people know when her grand opening would be. Sharon obtained a tax I.D. number and filled out all the other necessary paperwork. On her opening day, she was pleased that the sold made almost $3000.00 in sales.

Sharon wanted to open a store to sell used computers. She found a location that she could afford and signed a lease for the building. She hired a couple of salespeople, but she needed two more. She took out ads on television and radio to let people know when her grand opening would be. Sharon tried to fill out as much of the tax and business license paperwork as she could, but it was too much for her, and she only got through half of it. When the salespeople she had hired tried to call her to see when their starting day would be, she never returned their phone calls.

Research Question: Sharon established a business.
True distracter: Sharon leased an edifice.
False distracter: Sharon bought an edifice.

(21) ORGANIZE a camping trip

Patrick was planning a camping trip with his friends.
He e-mailed his friends and suggested a date for the trip. He made a reservation online for the campsite. He borrowed two tents and several sleeping bags from his university's camping club, plus a lot of other camping equipment. He got two of his friends who had large vehicles to agree to drive. He got a commitment from each of his friends to bring some food supplies. Patrick and his friends had a good time camping, despite some sunburn and poison ivy.

Patrick was planning a camping trip with his friends. He e-mailed his friends and suggested a date for the trip. He borrowed two tents and several sleeping bags from his

university's camping club, plus a lot of other camping equipment. He got two of his friends who had large vehicles to agree to drive. Unfortunately, he forgot to ask each of his friends to bring some food supplies, and he also forgot to make a reservation for the campsite until it was too late for a good location. Everyone, including Patrick, eventually backed out of the trip.

Research Question: Patrick organized a camping trip.
True distracter: Patrick collaborated with others in his endeavor.
False distracter: Patrick didn't collaborate with others in his endeavor.

(22) cup of water FREEZE

A man poured a cup of water for himself on a very cold winter day. He walked outside with the cup of water in his hand. He set it on his front porch railing and went back inside to get his cigarette lighter. He forgot about the cup of water when he got a phone call. When he went back outside a few hours later, he found the cup with a solid block of ice inside. He dumped it out, and it was the same shape as the cup.

A man poured a cup of water for himself on a very cold winter day. He walked outside with the cup of water in his hand. He set it on his front porch railing and went back inside to get his cigarette lighter. He forgot about the cup of water when he got a phone call. When he went back outside an hour later, he fuond the cup and saw that there was a layer of ice on the the surface. He broke through the ice and drank the water.

Research Question: A cup of water froze.
True distracter: The water underwent a physical change.
False distracter: The water underwent a chemical reaction.

(23) Please comment briefly on the survey you have just completed (limit 250 words). Describe any difficulty or doubts you had about answering the questions. Your comments are required for completion of this Amazon Mechanical Turk Human Intelligence Task.

2. SCENARIO ORDERS: PARTICIPANTS WERE SHOWN THE RELEVANT TEXT SCENARIOS, THEN PRESENTED WITH SENTENCES AND ASKED TO JUDGE THEM AS TRUE OR FALSE.

Form A:

1. assemble_telescope completed version
Lucy assembled a telescope.
At the beginning of the scenario, Lucy was enthusiastic about a scientific contraption. (true)
(Presentation of "arayopi" photo)
This is an arayopi.

2. establish_business non-completed version
Sharon bought an edifice. (false)
Sharon established a business.
(Presentation of "hxlms" photo)
This is an hxlms.

3. solve_problem completed version
At the beginning of the scenario, there was consensus between the employees. (false)
Melanie solved the problem.
A hxlms has wings. (false)

4. peel_orange non-completed version
Rachael peeled an orange.
What Rachael selected was a citrus. (true)
An oeyui is made of metal. (true)

5. build_house completed version
Jake was adept at carpentry. (true)
Jake built a house.

6. pan_of_water_evaporate completed version
The pan of water evaporated.
Leah's teacher assigned her a task. (true)
(Presentation of "yode" photo)
This is a yode.

7. organize_trip completed version
Patrick organized a camping trip.
Patrick collaborated with others in his endeavor. (true)

8. write_story completed version
Brendan wrote a story.
The plot Brendan conceived was a fantasy. (true)

9. cup_water_freeze non-completed version
The water underwent a chemical reaction. (false)
The cup of water froze.
A dennuck lives in the sea. (false)

10. paint_barn non-completed version
Keane painted the barn.
Keane was concerned about the effects of the elements on a piece of his property. (true)

11. knit_blanket completed
Tess was proficient at a kneedlecraft. (true)
Tess knitted a blanket.

12. eat_sandwich non-completed version
Daniel ate a sandwich.
Daniel was not ingesting a comestible item. (false)
(Presentation of "btetd" photo)
This is a btetd.

13. make_hat completed version
Erin made a hat.
Erin bought the finished merchandise of a professional milliner. (false)

14. read_book non-completed version
"The Venusian Venture" was a novel in the sci-fi genre. (true)
Vance read "The Venusian Venture."
(Presentation of "oeyui" photo)
This is an oeyui.

15. fix_radio non-completed version
Natalie fixed the radio.
At the beginning of this scenario, the apparatus was not malfunctioning. (false)

16. sew_dress completed version
Gloria forgot to buy textiles. (false)
Gloria sewed a dress.
An arayopi can fly. (true)

17. create_report non-completed version
Norman's subordinate directed him to format some statistics. (false)
Norman created a report.

18. convince completed version
Eric convinced Dora to go to New Orleans.
At the beginning of the scenario, Dora was enthusiastic to comply with Eric's wishes. (false)
(Presentation of "dennucks" photo)
These are dennucks.

19. devise_plan non-completed version
Mr. Thomas was an ambitious bureaucrat. (true)
Mr. Thomas devised a plan.
A btetd is used for fastening things. (true)

20. drink_cup_coffee completed version
Leslie was not on her way to a place of employment. (false)
Leslie drank a cup of coffee.

21. install_program non-completed version
Martina installed the program.
Martina wanted to have special software on her computer. (true)
(Presentation of "yode" photo)
This is a yode.

3. DISTRACTER PHOTOS: THE FOLLOWING PUBLIC-DOMAIN PHOTOS WERE ASSOCIATED WITH DISTRACTER QUESTIONS. EACH PHOTO AND A MADE-UP NAME WAS PRESENTED TO EACH PARTICIPANT BEFORE THE EXPERIMENT PROPER BEGAN.

This is an **uouiue.**

This is a **hxlms**.

This is a **yode**.

These are two **dennucks**.

This is an **oeyui**.
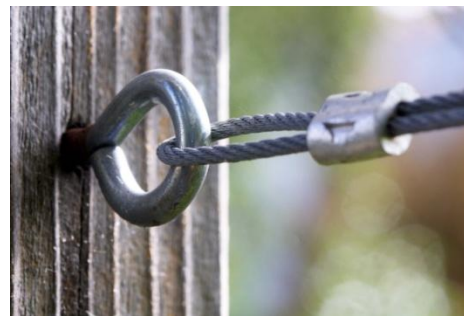
This is a **btetd**

This is an **arayopi**.

This is a **lubbez**.

Appendix D

Experiment Two Response Data

1. *True/False/Not Sure* Judgments on Sentences Presented

P_Id	native_lang	born	grew_up	sew_dress_i	sew_dress_c	peel_orange_i	peel_orange_c	pan_of_water_evaporate_i	pan_of_water_evaporate_c	ice_melt_i	ice_melt_c	write_story_i	write_story_c
14	English	US	US	--	T	T	--	--	T	T	--	--	T
12	english	usa	usa	--	T	T	--	--	T	T	--	--	T
13	english	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
11	English	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
10	English	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
9	English	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
15	English	USA	USA	--	T	T	--	--	T	T	--	--	T
16	English	US	US	--	T	T	--	--	T	T	--	--	T
21	English	United Sta	United Sta	--	T	F	--	--	T	T	--	--	T
22	English	USA	USA	--	T	T	--	--	T	T	--	--	T
26	English	USA	USA	T	--	--	T	T	--	--	T	T	--
27	English	USA	USA	NS	--	--	T	T	--	--	T	T	--
28	English	U.S.A.	U.S.A	F	--	--	T	NS	--	--	T	T	--
31	english	USA	USA	T	--	--	T	T	--	--	T	T	--
32	english	usa	usa	T	--	--	T	T	--	--	T	T	--
33	English	USA	USA	F	--	--	T	T	--	--	T	T	--
34	English	USA	USA	F	--	--	T	T	--	--	T	T	--
35	English	USA	USA	T	--	--	T	T	--	--	T	F	--
36	English	United Sta	United Sta	T	--	--	T	NS	--	--	T	T	--
37	English	United Sta	United Sta	T	--	--	T	T	--	--	T	T	--
38	English	United Sta	United Sta	T	--	--	T	T	--	--	T	T	--
39	english	america	maerica	T	--	--	T	T	--	--	T	T	--
40	English	USA (US A	USA	F	--	--	T	T	--	--	T	T	--
41	English	United Sta	United Sta	F	--	--	T	F	--	--	T	T	--

Table 10: *True/False/Not Sure* Judgments on Sentences Presented

P_Id	paint_barn_i	paint_barn_c	knit_blanket_i	knit_blanket_c	eat_sandwich_i	eat_sandwich_c	drink_cup_coffee_i	drink_cup_coffee_c	read_book_i	read_book_c	build_house_i	build_house_c	fix_radio_i	fix_radio_c
14	T	--	--	T	T	--	--	T	T	--	--	T	F	--
12	F	--	--	T	T	--	--	T	F	--	--	T	F	--
13	T	--	--	T	T	--	--	T	F	--	--	T	F	--
11	T	--	--	T	T	--	--	T	T	--	--	T	F	--
10	T	--	--	T	T	--	--	T	F	--	--	T	F	--
9	T	--	--	F	T	--	--	T	T	--	--	T	F	--
15	T	--	--	T	T	--	--	T	T	--	--	T	F	--
16	T	--	--	T	T	--	--	T	F	--	--	T	F	--
21	F	--	--	T	F	--	--	T	F	--	--	T	F	--
22	T	--	--	T	T	--	--	T	F	--	--	T	F	--
26	--	T	T	--	--	T	T	--	--	T	F	--	--	T
27	--	T	F	--	--	T	F	--	--	T	F	--	--	NS
28	--	T	F	--	--	T	F	--	--	T	F	--	--	T
31	--	T	T	--	--	T	T	--	--	T	T	--	--	T
32	--	T	T	--	--	T	T	--	--	T	T	--	--	T
33	--	T	T	--	--	T	T	--	--	T	NS	--	--	T
34	--	T	T	--	--	T	T	--	--	T	F	--	--	T
35	--	T	T	--	--	T	T	--	--	T	F	--	--	T
36	--	T	T	--	--	T	T	--	--	T	T	--	--	T
37	--	T	F	--	--	T	T	--	--	T	F	--	--	T
38	--	T	T	--	--	T	T	--	--	T	NS	--	--	T
39	--	T	F	--	--	T	T	--	--	T	T	--	--	F
40	--	T	NS	--	--	T	T	--	--	T	T	--	--	T
41	--	T	F	--	--	T	T	--	--	T	T	--	--	T

Table 10: cont.

P_Id	solve_problem_i	solve_problem_c	create_report_i	create_report_c	convince_i	convince_c	devise_plan_i	devise_plan_c	assemble_telescope_i	assemble_telescope_c	install_program_i	install_program_c	make_hat_i	make_hat_c
14	--	T	F	--	--	T	T	--	--	T	F	--	--	T
12	--	T	F	--	--	F	T	--	--	T	F	--	--	F
13	--	T	F	--	--	T	T	--	--	T	F	--	--	T
11	--	T	T	--	--	T	T	--	--	T	F	--	--	T
10	--	T	T	--	--	T	T	--	--	T	F	--	--	T
9	--	T	F	--	--	T	F	--	--	T	F	--	--	T
15	--	F	F	--	--	T	T	--	--	T	F	--	--	T
16	--	T	F	--	--	T	NS	--	--	T	F	--	--	T
21	--	T	F	--	--	T	F	--	--	T	F	--	--	T
22	--	T	F	--	--	T	T	--	--	T	F	--	--	T
26	F	--	--	T	F	--	--	T	F	--	--	T	F	--
27	F	--	--	T	NS	--	--	T	NS	--	--	NS	NS	--
28	F	--	--	T	NS	--	--	T	F	--	--	T	F	--
31	F	--	--	T	F	--	--	T	F	--	--	T	F	--
32	F	--	--	T	NS	--	--	T	F	--	--	T	T	--
33	F	--	--	T	NS	--	--	T	F	--	--	T	F	--
34	F	--	--	T	F	--	--	T	T	--	--	T	T	--
35	F	--	--	T	F	--	--	T	T	--	--	T	NS	--
36	F	--	--	T	F	--	--	T	T	--	--	T	T	--
37	F	--	--	T	F	--	--	T	F	--	--	T	F	--
38	F	--	--	T	NS	--	--	T	T	--	--	T	T	--
39	F	--	--	T	F	--	--	T	F	--	--	T	F	--
40	NS	--	--	T	NS	--	--	T	F	--	--	T	F	--
41	F	--	--	T	F	--	--	T	F	--	--	T	F	--

Table 10: cont.

P_Id	establish_business_i	establish_business_c	organize_trip_i	organize_trip_c	cup_water_freeze_i	cup_water_freeze_c	d_bought_textiles_t	d_forgot_textiles_f	d_citrus_t	d_not_citrus_f	d_task_t	d_not_task_f	d_transported_t	d_not_transported_f
14	T	--	--	T	T	--	--	F	T	--	T	--	--	--	F
12	T	--	--	T	T	--	--	F	T	--	T	--	--	--	T
13	T	--	--	T	T	--	--	F	T	--	T	--	--	--	F
11	T	--	--	T	T	--	--	F	T	--	T	--	--	--	F
10	F	--	--	T	T	--	--	F	T	--	T	--	--	--	F
9	F	--	--	T	T	--	--	F	T	--	T	--	--	--	F
15	T	--	--	T	T	--	--	F	T	--	T	--	--	--	T
16	F	--	--	T	NS	--	--	F	T	--	T	--	--	--	F
21	T	--	--	T	T	--	--	F	T	--	T	--	--	--	F
22	F	--	--	T	T	--	--	F	T	--	T	--	--	--	F
26	--	T	T	--	--	T	--	F	T	--	T	--	--	--	F
27	--	T	T	--	--	T	--	NS	NS	--	T	--	--	--	F
28	--	T	F	--	--	T	--	F	T	--	T	--	--	--	F
31	--	T	NS	--	--	T	--	F	T	--	T	--	--	--	F
32	--	T	T	--	--	T	--	F	T	--	T	--	--	--	T
33	--	T	T	--	--	T	--	F	T	--	T	--	--	--	NS
34	--	T	T	--	--	T	--	F	T	--	T	--	--	--	T
35	--	T	T	--	--	T	--	F	T	--	T	--	--	--	F
36	--	T	T	--	--	T	--	F	T	--	T	--	--	--	T
37	--	T	T	--	--	T	--	F	T	--	T	--	--	--	F
38	--	T	T	--	--	T	--	F	T	--	T	--	--	--	T
39	--	T	T	--	--	T	--	F	T	--	T	--	--	--	F
40	--	T	T	--	--	T	--	F	T	--	T	--	--	--	F
41	--	T	T	--	--	T	--	F	T	--	T	--	--	--	NS

Table 10: cont.

P_Id	d_fantasy_t	d_not_fantasy_f	d_elements_t	d_not_elements_f	d_proficient_t	d_not_proficient_f	d_ingest_t	d_not_ingest_f	d_employment_t	d_not_employment_f	d_novel_t	d_not_novel_f	d_adept_t	d_inept_f
14	T	--	T	--	NS	--	--	NS	--	F	T	--	NS	--
12	T	--	T	--	T	--	--	NS	--	T	T	--	T	--
13	T	--	T	--	T	--	--	T	--	F	T	--	T	--
11	T	--	T	--	T	--	--	NS	--	F	NS	--	T	--
10	T	--	F	--	T	--	--	F	--	NS	T	--	T	--
9	T	--	T	--	T	--	--	F	--	F	T	--	T	--
15	T	--	F	--	T	--	--	T	--	F	T	--	T	--
16	T	--	T	--	T	--	--	NS	--	F	T	--	T	--
21	T	--	T	--	T	--	--	F	--	F	T	--	T	--
22	T	--	F	--	T	--	--	F	--	F	T	--	T	--
26	T	--	T	--	T	--	--	F	--	F	T	--	T	--
27	T	--	NS	--	T	--	--	F	--	F	T	--	T	--
28	T	--	T	--	NS	--	--	NS	--	F	T	--	NS	--
31	T	--	T	--	T	--	--	F	--	F	NS	--	T	--
32	T	--	T	--	T	--	--	T	--	F	T	--	T	--
33	T	--	T	--	T	--	--	F	--	F	T	--	T	--
34	T	--	F	--	T	--	--	F	--	F	T	--	F	--
35	T	--	T	--	T	--	--	F	--	T	T	--	T	--
36	T	--	F	--	T	--	--	NS	--	F	NS	--	T	--
37	T	--	T	--	T	--	--	F	--	F	T	--	NS	--
38	T	--	T	--	F	--	--	NS	--	F	T	--	T	--
39	T	--	T	--	T	--	--	NS	--	F	T	--	T	--
40	T	--	T	--	NS	--	--	NS	--	F	T	--	NS	--
41	T	--	T	--	T	--	--	F	--	F	T	--	T	--

Table 10: cont.

P_Id	d_malfunction_t	d_not_malfunction_f	d_discordant_t	d_consensus_f	d_statistics_t	d_not_statistics_f	d_reticent_t	d_enthusiastic_f	d_ambitious_t	d_unambitious_f	d_enthusiastic_t	d_apathetic_f	d_software_t
14	--	F	--	F	--	F	--	F	T	--	T	--	T
12	--	F	--	F	--	T	--	NS	T	--	NS	--	T
13	--	F	--	F	--	F	--	F	F	--	T	--	T
11	--	F	--	F	--	F	--	F	F	--	T	--	T
10	--	F	--	F	--	T	--	F	F	--	NS	--	T
9	--	F	--	F	--	F	--	F	T	--	T	--	T
15	--	F	--	F	--	F	--	F	T	--	T	--	T
16	--	F	--	F	--	F	--	F	T	--	T	--	T
21	--	F	--	F	--	F	--	F	F	--	T	--	T
22	--	F	--	F	--	F	--	F	T	--	T	--	T
26	--	F	--	F	--	F	--	F	T	--	T	--	T
27	--	NS	--	F	--	NS	--	F	T	--	NS	--	NS
28	--	F	--	F	--	F	--	F	T	--	T	--	T
31	--	F	--	F	--	F	--	F	T	--	T	--	T
32	--	F	--	F	--	F	--	F	T	--	T	--	T
33	--	F	--	F	--	F	--	F	T	--	T	--	T
34	--	F	--	F	--	F	--	F	T	--	T	--	T
35	--	F	--	F	--	F	--	F	T	--	T	--	T
36	--	F	--	F	--	F	--	F	T	--	T	--	T
37	--	T	--	F	--	F	--	F	T	--	T	--	T
38	--	F	--	F	--	F	--	F	T	--	T	--	T
39	--	F	--	F	--	T	--	F	T	--	T	--	T
40	--	F	--	F	--	NS	--	F	NS	--	T	--	T
41	--	F	--	F	--	F	--	F	F	--	T	--	T

Table 10: cont.

P_Id	d_hardware_f	d_dabble_t	d_milliner_f	d_lease_t	d_buy_f	d_collaborate_t	d_not_collaborate_f	d_physical_t	d_chemical_f	red_flower_wings	seahorse_useful_tool	marmoset_sea	connector_metal	cord_fasten	dragfly_fly
14	--	--	F	--	F	T	--	--	NS	T	--	NS	T	T	T
12	--	--	F	--	F	T	--	--	T	F	--	F	T	T	T
13	--	--	F	--	F	T	--	--	T	F	--	F	T	T	T
11	--	--	F	--	F	T	--	--	F	F	--	F	T	T	T
10	--	--	F	--	F	T	--	--	T	F	--	NS	NS	T	T
9	--	--	F	--	T	T	--	--	F	F	--	F	T	T	T
15	--	--	F	--	F	T	--	--	T	F	--	F	F	T	T
16	--	--	F	--	F	T	--	--	F	F	--	NS	T	T	T
21	--	--	F	--	F	T	--	--	F	F	--	NS	T	NS	F
22	--	--	F	--	F	T	--	--	F	F	--	NS	NS	T	T
26	--	--	F	--	F	T	--	--	F	NS	NS	NS	NS	T	T
27	--	--	NS	--	NS	T	--	--	F	F	F	F	NS	NS	T
28	--	--	F	--	NS	T	--	--	F	F	F	F	NS	NS	T
31	--	--	F	--	F	T	--	--	F	F	F	F	T	F	T
32	--	--	F	--	F	F	--	--	T	F	F	F	F	T	T
33	--	--	F	--	NS	T	--	--	NS	F	NS	F	NS	T	T
34	--	--	F	--	F	T	--	--	F	T	F	F	T	T	T
35	--	--	F	--	F	T	--	--	F	F	F	F	T	T	T
36	--	--	F	--	F	T	--	--	T	F	NS	NS	T	F	T
37	--	--	F	--	F	T	--	--	T	F	F	F	T	NS	T
38	--	--	F	--	F	NS	--	--	NS	NS	F	NS	T	NS	T
39	--	--	F	--	F	T	--	--	T	F	F	F	NS	NS	T
40	--	--	F	--	T	T	--	--	F	F	F	F	T	T	T
41	--	--	F	--	F	T	--	--	F	F	F	NS	NS	T	T

Table 10: cont.

P_Id	native_lang	born	grew_up	sew_dress_i	sew_dress_c	peel_orange_i	peel_orange_c	pan_of_water_evaporate_i	pan_of_water_evaporate_c	ice_melt_i	ice_melt_c	write_story_i	write_story_c
42	english	us	us	T	--	--	T	T	--	--	T	T	--
43	English	USA	USA	F	--	--	T	T	--	--	T	T	--
44	english	usa	usa	F	--	--	T	T	--	--	T	NS	--
45	english	usa	usa	F	--	--	T	T	--	--	T	F	--
46	english	usa	usa	--	T	T	--	--	T	T	--	--	T
47	english	USA	USA	--	T	T	--	--	T	T	--	--	T
48	English	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
49	English	USA	USA	--	T	T	--	--	T	T	--	--	T
50	English	USA	USA	--	T	T	--	--	T	T	--	--	T
51	English	USA	USA	--	T	T	--	--	T	T	--	--	T
53	English	USA	USA	--	T	T	--	--	T	T	--	--	T
55	English	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
57	ENGLISH	UNITED ST	UNITED ST	--	T	T	--	--	T	T	--	--	T
58	English	United Sta	United Sta	--	T	F	--	--	T	T	--	--	T
60	English	USA	USA	--	T	T	--	--	NS	T	--	--	T
61	english	usa	usa	--	T	T	--	--	T	T	--	--	T
62	English	USA	USA	--	T	T	--	--	T	T	--	--	T
63	English	USA	USA	--	T	T	--	--	NS	T	--	--	T
64	English	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
65	English	USA	USA	--	T	T	--	--	T	T	--	--	T
66	english	usa	usa	--	T	T	--	--	NS	F	--	--	T
67	English	USA	USA	--	T	T	--	--	T	T	--	--	T
68	English	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
70	English	USA	USA	--	T	T	--	--	T	T	--	--	T
71	English	USA	USA	--	T	T	--	--	NS	T	--	--	T

Table 10: cont.

P_Id	paint_barn_i	paint_barn_c	knit_blanket_i	knit_blanket_c	eat_sandwich_i	eat_sandwich_c	drink_cup_coffee_i	drink_cup_coffee_c	read_book_i	read_book_c	build_house_i	build_house_c	fix_radio_i	fix_radio_c
42	--	T	F	--	--	T	T	--	--	T	F	--	--	T
43	--	T	F	--	--	T	T	--	--	T	F	--	--	T
44	--	T	F	--	--	T	F	--	--	T	F	--	--	T
45	--	T	F	--	--	T	F	--	--	T	F	--	--	T
46	T	--	--	T	T	--	--	T	T	--	--	T	F	--
47	T	--	--	T	T	--	--	T	T	--	--	T	F	--
48	F	--	--	T	F	--	--	T	F	--	--	T	F	--
49	T	--	--	T	T	--	--	T	T	--	--	T	F	--
50	T	--	--	T	T	--	--	T	T	--	--	T	F	--
51	T	--	--	T	T	--	--	T	T	--	--	T	F	--
53	T	--	--	T	T	--	--	T	T	--	--	T	F	--
55	T	--	--	T	T	--	--	T	F	--	--	T	F	--
57	T	--	--	T	T	--	--	T	F	--	--	T	F	--
58	NS	--	--	T	T	--	--	T	F	--	--	T	F	--
60	T	--	--	T	T	--	--	T	T	--	--	T	F	--
61	T	--	--	T	T	--	--	T	T	--	--	T	F	--
62	T	--	--	T	T	--	--	T	T	--	--	T	F	--
63	T	--	--	T	T	--	--	T	T	--	--	T	F	--
64	T	--	--	T	T	--	--	T	T	--	--	T	F	--
65	T	--	--	F	T	--	--	T	T	--	--	T	F	--
66	T	--	--	T	T	--	--	T	F	--	--	T	F	--
67	T	--	--	T	T	--	--	T	T	--	--	T	F	--
68	T	--	--	T	T	--	--	T	F	--	--	T	F	--
70	T	--	--	T	T	--	--	T	T	--	--	T	F	--
71	F	--	--	T	T	--	--	T	F	--	--	T	F	--

Table 10: cont.

P_Id	solve_problem_i	solve_problem_c	create_report_i	create_report_c	convince_i	convince_c	devise_plan_i	devise_plan_c	assemble_telescope_i	assemble_telescope_c	install_program_i	install_program_c	make_hat_i	make_hat_c
42	F	--	--	T	F	--	--	T	F	--	--	T	F	--
43	F	--	--	T	NS	--	--	T	F	--	--	T	F	--
44	F	--	--	T	F	--	--	T	F	--	--	T	F	--
45	F	--	--	T	F	--	--	T	F	--	--	T	F	--
46	--	T	T	--	--	T	F	--	--	T	T	--	--	T
47	--	T	T	--	--	T	T	--	--	T	F	--	--	T
48	--	T	F	--	--	T	F	--	--	T	F	--	--	T
49	--	T	T	--	--	T	T	--	--	T	F	--	--	T
50	--	T	NS	--	--	T	T	--	--	T	F	--	--	T
51	--	T	F	--	--	T	F	--	--	T	F	--	--	T
53	--	T	F	--	--	T	F	--	--	T	F	--	--	T
55	--	T	F	--	--	T	NS	--	--	T	F	--	--	T
57	--	T	F	--	--	T	F	--	--	T	T	--	--	T
58	--	T	F	--	--	T	T	--	--	T	F	--	--	T
60	--	T	T	--	--	T	T	--	--	T	F	--	--	T
61	--	NS	T	--	--	T	T	--	--	T	T	--	--	T
62	--	T	F	--	--	T	T	--	--	T	F	--	--	T
63	--	T	F	--	--	T	F	--	--	T	F	--	--	T
64	--	F	T	--	--	T	T	--	--	T	F	--	--	T
65	--	T	T	--	--	T	T	--	--	T	F	--	--	T
66	--	T	T	--	--	T	F	--	--	T	F	--	--	T
67	--	T	T	--	--	T	T	--	--	T		--	--	T
68	--	T	T	--	--	T	T	--	--	T	F	--	--	T
70	--	T	T	--	--	T	T	--	--	T	T	--	--	T
71	--	T	F	--	--	T	T	--	--	T	F	--	--	T

Table 10: cont.

P_Id	establish_business_i	establish_business_c	organize_trip_i	organize_trip_c	cup_water_freeze_i	cup_water_freeze_c	d_bought_textiles_t	d_forgot_textiles_f	d_citrus_t	d_not_citrus_f	d_task_t	d_not_task_f	d_transported_t	d_not_transported_f
42	--	T	F	--	--	T	--	F	T	--	T	--	--	F
43	--	T	T	--	--	T	--	F	T	--	T	--	--	F
44	--	T	F	--	--	T	--	F	T	--	T	--	--	F
45	--	T	F	--	--	T	--	F	T	--	T	--	--	F
46	F	--	--	T	T	--	--	T	F	--	T	--	--	F
47	T	--	--	T	T	--	--	F	T	--	T	--	--	F
48	T	--	--	T	T	--	--	F	T	--	T	--	--	F
49	F	--	--	T	T	--	--	F	T	--	T	--	--	F
50	T	--	--	T	T	--	--	F	T	--	T	--	--	F
51	T	--	--	T	T	--	--	F	T	--	T	--	--	NS
53	T	--	--	T	T	--	--	F	T	--	T	--	--	F
55	F	--	--	T	NS	--	--	F	T	--	T	--	--	F
57	T	--	--	T	T	--	--	F	T	--	T	--	--	NS
58	F	--	--	T	F	--	--	F	T	--	T	--	--	F
60	T	--	--	T	T	--	--	F	T	--	T	--	--	F
61	T	--	--	T	T	--	--	NS	T	--	T	--	--	T
62	T	--	--	T	F	--	--	F	T	--	T	--	--	F
63	T	--	--	T	F	--	--	F	T	--	T	--	--	F
64	T	--	--	T	T	--	--	F	T	--	T	--	--	T
65	T	--	--	T	T	--	--	F	T	--	T	--	--	F
66	T	--	--	T	T	--	--	F	T	--	T	--	--	F
67	T	--	--	T	T	--	--	F	T	--	T	--	--	F
68	NS	--	--	T	T	--	--	F	T	--	T	--	--	F
70	T	--	--	T	T	--	--	F	T	--	T	--	--	F
71	F	--	--	T	F	--	--	F	T	--	T	--	--	F

Table 10: cont.

P_Id	d_fantasy_t	d_not_fantasy_f	d_elements_t	d_not_elements_f	d_proficient_t	d_not_proficient_f	d_ingest_t	d_not_ingest_f	d_employment_t	d_not_employment_f	d_novel_t	d_not_novel_f	d_adept_t	d_inept_f
42	T	--	T	--	NS	--	--	NS	--	F	T	--	T	--
43	T	--	T	--	T	--	--	F	--	F	T	--	T	--
44	T	--	T	--	T	--	--	F	--	F	NS	--	NS	--
45	T	--	T	--	NS	--	--	F	--	F	T	--	NS	--
46	T	--	T	--	F	--	--	F	--		T	--	T	--
47	T	--	T	--	T	--	--	F	--	F	T	--	T	--
48	T	--	F	--	T	--	--	T	--	NS	T	--	T	--
49	T	--	F	--	T	--	--	F	--	F	T	--	T	--
50	T	--	F	--	T	--	--	F	--	F	T	--	T	--
51	T	--	T	--	F	--	--	T	--	F	NS	--	T	--
53	T	--	F	--	F	--	--	NS	--	F	T	--	NS	--
55	T	--	F	--	T	--	--	F	--	F	T	--	T	--
57	T	--	T	--	T	--	--	NS	--	T	NS	--	F	--
58	T	--	T	--	T	--	--	F	--	F	T	--	NS	--
60	T	--	T	--	T	--	--	NS	--	F	NS	--	T	--
61	T	--	T	--	T	--	--	T	--	F	T	--	T	--
62	T	--	T	--	T	--	--	NS	--	F	T	--	T	--
63	T	--	T	--	T	--	--	F	--	F	T	--	T	--
64	T	--	T	--	T	--	--	F	--	F	T	--	T	--
65	T	--	F	--	T	--	--	T	--	F	T	--	T	--
66	T	--	T	--	T	--	--	F	--	F	T	--	T	--
67	T	--	T	--	T	--	--	T	--	T	NS	--	T	--
68	T	--	F	--	T	--	--	F	--	F	T	--	T	--
70	T	--	T	--	T	--	--	F	--	F	T	--	T	--
71	T	--	T	--	T	--	--	F	--	F	NS	--	T	--

Table 10: cont.

P_Id	d_malfunction_t	d_not_malfunction_f	d_discordant_t	d_consensus_f	d_statistics_t	d_not_statistics_f	d_reticent_t	d_enthusiastic_f	d_ambitious_t	d_unambitious_f	d_enthusiastic_t	d_apathetic_f	d_software_t	d_hardware_f
42	--	F	--	F	--	F	--	F	T	--	T	--	T	--
43	--	F	--	F	--	F	--	F	F	--	T	--	T	--
44	--	F	--	F	--	F	--	F	T	--	T	--	T	--
45	--	F	--	F	--	F	--	F	T	--	T	--	T	--
46	--	F	--	F	--	T	--	F	F	--	T	--	T	--
47	--	F	--	F	--	F	--	F	T	--	T	--	T	--
48	--	T	--	F	--	F	--	F	T	--	T	--	T	--
49	--	F	--	F	--	F	--	F	T	--	T	--	T	--
50	--	F	--	F	--	F	--	F	T	--	T	--	T	--
51	--	F	--	F	--	F	--	F	T	--	T	--	T	--
53	--	F	--	F	--	F	--	F	T	--	F	--	T	--
55	--	F	--	F	--	F	--	F	T	--	T	--	T	--
57	--	F	--	F	--	F	--	F	T	--	T	--	T	--
58	--	F	--	F	--	F	--	F	NS	--	T	--	T	--
60	--	F	--	F	--	F	--	F	T	--	T	--	T	--
61	--	NS	--	F	--	F	--	F	T	--	NS	--	T	--
62	--	F	--	F	--	F	--	F	T	--	F	--	T	--
63	--	F	--	F	--	F	--	F	T	--	T	--	T	--
64	--	F	--	F	--	F	--	F	T	--	T	--	T	--
65	--	F	--	NS	--	T	--	F	T	--	T	--	T	--
66	--	F	--	F	--	F	--	F	NS	--	T	--	T	--
67	--	F	--	F	--	F	--	F	T	--	T	--	T	--
68	--	F	--	F	--	F	--	F	T	--	T	--	T	--
70	--	F	--	F	--	F	--	F	T	--	T	--	T	--
71	--	F	--	F	--	F	--	F	T	--	T	--	T	--

Table 10: cont.

P_Id	d_dabble_t	d_milliner_f	d_lease_t	d_buy_f	d_collaborate_t	d_not_collaborate_f	d_physical_t	d_chemical_f	red_flower_wings	seahorse_useful_tool	marmoset_sea	connector_metal	cord_fasten	dragfly_fly
42	--	F	--	F	F	--	--	T	F	T	F	T	NS	T
43	--	F	--	F	T	--	--	T	NS	F	NS	T	NS	F
44	--	F	--	F	T	--	--	F	F	F	F	T	F	T
45	--	F	--	NS	T	--	--	F	F	F	F	T	T	T
46	--	F	--	F	T	--	--	F	F	--	T	T	F	T
47	--	F	--	F	T	--	--	NS	F	--	NS	NS	T	T
48	--	F	--	F	T	--	--	NS	F	--	F	T	T	T
49	--	F	--	T	T	--	--	F	F	--	F	T	T	T
50	--	F	--	F	T	--	--	F	F	--	F	T	T	T
51	--	F	--	F	T	--	--	F	F	--	F	T	T	F
53	--	NS	--	F	F	--	--	T	F	--	F	T	T	T
55	--	F	--	F	T	--	--	T	F	--	F	T	T	T
57	--	F	--	NS	T	--	--	NS	T	--	F	T	T	T
58	--	F	--	F	T	--	--	NS	F	--	F	T	T	T
60	--	F	--	F	T	--	--	T	F	--	F	NS	T	NS
61	--	F	--	F	T	--	--	F	F	--	NS	NS	T	NS
62	--	F	--	F	F	--	--	F	F	--	F	F	T	T
63	--	F	--	F	T	--	--	T	F	--	F	NS	T	T
64	--	F	--	F	T	--	--	F	F	--	F	F	T	F
65	--	F	--	F	T	--	--	NS	F	--	F	T	T	T
66	--	F	--	F	T	--	--	T	F	--	NS	NS	T	F
67	--	F	--	F	T	--	--	T	F	--	NS	T	T	F
68	--	F	--	F	T	--	--	T	F	--	F	T	T	T
70	--	F	--	F	T	--	--	F	F	--	F	T	F	T
71	--	F	--	T	T	--	--	NS	F	--	F	NS	T	T

Table 10: cont.

P_Id	native_lang	born	grew_up	sew_dress_i	sew_dress_c	peel_orange_i	peel_orange_c	pan_of_water_evaporate_i	pan_of_water_evaporate_c	ice_melt_i	ice_melt_c	write_story_i	write_story_c
72	english	usa	usa	--	T	T	--	--	T	F	--	--	T
73	English	U.S.A.	U.S.A.	--	T	T	--	--	T	T	--	--	T
74	English	USA	USA	--	T	T	--	--	T	T	--	--	T
76	English	USA	USA	--	T	T	--	--	T	T	--	--	T
77	English	USA	USA	--	T	T	--	--	T	T	--	--	T
79	English	US	US	T	--	--	T	T	--	--	T	T	--
80	English	United Sta	United Sta	F	--	--	T	T	--	--	T	T	--
81	English	United Sta	United Sta	--	T	T	--	--	T	T	--	--	T
82	english	usa	usa	T	--	--			--	--	T	T	--
83	english	usa	usa	F	--	--	T	T	--	--	T	T	--
84	English	United Sta	United Sta	F	--	--	T	T	--	--	T	T	--
86	English	USA	USA	T	--	--	T	T	--	--	T	T	--
87	nglish	USA	USA	T	--	--	T	T	--	--	T	T	--
88	english	usa	usa	T	--	--	T	T	--	--	T	T	--
90	English	USA	USA	--	T	T	--	--	T	T	--	--	T
91	English	USA	usa	F	--	--	T	T	--	--	T	T	--
92	english	United Sta	United Sta	F	--	--	T	F	--	--	T	T	--
95	English	USA	USA	T	--	--	T	T	--	--	T	T	--
96	English	USA	USA	F	--	--	T	T	--	--	T	T	--
97	English	US	US	F	--	--	T	T	--	--	T	F	--
98	English	United Sta	United Sta	T	--	--	T	T	--	--	T	F	--
99	English	USA	USA	T	--	--	T	T	--	--	T	T	--
101	English	USA	USA	F	--	--	T	T	--	--	T	F	--
103	English	United Sta	United Sta	T	--	--	T	T	--	--	T	F	--
105	English	USA	USA, Calif	T	--	--	T	T	--	--	T	T	--
107	English	USA	USA	T	--	--	T	T	--	--	T	T	--
108	English	USA	USA	T	--	--	T	T	--	--	T	T	--
109	english	usa	usa	T	--	--	T	T	--	--	T	T	--
110	English	United Sta	United Sta	T	--	--	T	T	--	--	T	T	--

Table 10: cont.

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P_Id	paint_barn_i	paint_barn_c	knit_blanket_i	knit_blanket_c	eat_sandwich_i	eat_sandwich_c	drink_cup_coffee_i	drink_cup_coffee_c	read_book_i	read_book_c	build_house_i	build_house_c	fix_radio_i	fix_radio_c
72	F	--	--	T	T	--	--	F	F	--	--	T	F	--
73	T	--	--	NS	T	--	--	T	T	--	--	T	F	--
74	T	--	--	T	T	--	--	T	T	--	--	T	F	--
76	T	--	--	T	T	--	--	T	F	--	--	T	F	--
77	T	--	--	T	T	--	--	T	F	--	--	T	F	--
79	--	T	T	--	--	T	T	--	--	T	F	--	--	T
80	--	T	F	--	--	T	F	--	--	T	T	--	--	T
81	T	--	--	T	T	--	--	T	NS	--	--	T	T	--
82	--	T	T	--	--	T	T	--	--	T	F	--	--	T
83	--	T	F	--	--	T	F	--	--	T	F	--	--	T
84	--	T	F	--	--	T	T	--	--	T	T	--	--	T
86	--	T	T	--	--	T	T	--	--	T	F	--	--	T
87	--	T	T	--	--	T	T	--	--	T	T	--	--	T
88	--	T	T	--	--	T	T	--	--	T	T	--	--	T
90	T	--	--	T	T	--	--	T	NS	--	--	T	F	--
91	--	T	T	--	--	T	T	--	--	T	T	--	--	T
92	--	T	F	--	--	T	T	--	--	T	T	--	--	T
95	--	T	T	--	--	T	T	--	--	T	T	--	--	T
96	--	T	F	--	--	T	T	--	--	T	F	--	--	T
97	--	T	F	--	--	T	T	--	--	T	F	--	--	T
98	--	T	T	--	--	T	T	--	--	T	T	--	--	T
99	--	T	T	--	--	T	F	--	--	T	T	--	--	T
101	--	T	F	--	--	T	T	--	--	T	F	--	--	T
103	--	T	T	--	--		T	--	--	T	T	--	--	T
105	--	T	T	--	--	T	T	--	--	T	T	--	--	T
107	--	T	T	--	--	T	T	--	--	T	T	--	--	T
108	--	T	T	--	--	T	T	--	--	T	T	--	--	F
109	--	T	F	--	--	T	F	--	--	T	F	--	--	T
110	--	T	T	--	--	T	T	--	--	T	T	--	--	T

Table 10: cont.

P_Id	solve_problem_i	solve_problem_c	create_report_i	create_report_c	convince_i	convince_c	devise_plan_i	devise_plan_c	assemble_telescope_i	assemble_telescope_c	install_program_i	install_program_c	make_hat_i	make_hat_c
72	--	T	F	--	--	T	F	--	--	T	F	--	--	T
73	--	T	T	--	--	NS	T	--	--	T	F	--	--	T
74	--	T	T	--	--	T	T	--	--	T	T	--	--	T
76	--	T	F	--	--	T	F	--	--	T	F	--	--	T
77	--	T	F	--	--	T	T	--	--	T	F	--	--	T
79	T	--	--	T	F	--	--	T	T	--	--	T	T	--
80	F	--	--	T	F	--	--	T	F	--	--	T	F	--
81	--	F	F	--	--	F	F	--	--	T	F	--	--	T
82	NS	--	--	T	F	--	--	T	T	--	--	T	F	--
83	F	--	--	T	F	--	--	T	F	--	--	T	F	--
84	F	--	--	T	F	--	--	T	F	--	--	T	F	--
86	F	--	--	T	NS	--	--	T	T	--	--	T	F	--
87	F	--	--	T	NS	--	--	T	F	--	--	T	NS	--
88	T	--	--	T	F	--	--	T	T	--	--	T	F	--
90	--	T	T	--	--	T	F	--	--	T	T	--	--	T
91	F	--	--	T	NS	--	--	T	F	--	--	T	F	--
92	F	--	--	F	F	--	--	T	F	--	--	T	T	--
95	F	--	--	T	NS	--	--	T	NS	--	--	T	NS	--
96	NS	--	--	T	F	--	--	T	F	--	--	T	F	--
97	F	--	--	T	NS	--	--	T	F	--	--	T	F	--
98	F	--	--	T	F	--	--	T	T	--	--	T	T	--
99	F	--	--	T	F	--	--	T	F	--	--	T	F	--
101	F	--	--	T	F	--	--	T	F	--	--	T	F	--
103	F	--	--	T	NS	--	--	NS	T	--	--	F	NS	--
105	F	--	--	T	F	--	--	T	F	--	--	T	F	--
107	F	--	--	T	F	--	--	T	F	--	--	T	F	--
108	F	--	--	T	NS	--	--	T	F	--	--	T	F	--
109	F	--	--	T	F	--	--	T	F	--	--	T	F	--
110	NS	--	--	T	NS	--	--	T	T	--	--	T	NS	--

Table 10: cont.

P_Id	establish_business_i	establish_business_c	organize_trip_i	organize_trip_c	cup_water_freeze_i	cup_water_freeze_c	d_bought_textiles_t	d_forgot_textiles_f	d_citrus_t	d_not_citrus_f	d_task_t	d_not_task_f	d_transported_t	d_not_transported_f
72	T	--	--	T	F	--	--	F	T	--	T	--	--	F
73	F	--	--	T	T	--	--	F	T	--	T	--	--	NS
74	T	--	--	T	T	--	--	F	T	--	T	--	--	F
76	T	--	--	T	T	--	--	F	T	--	T	--	--	F
77	T	--	--	T	T	--	--	F	T	--	T	--	--	F
79	--	T	T	--	--	T	--	F	T	--	T	--	--	F
80	--	T	T	--	--	T	--	F	T	--	T	--	--	F
81	T	--	--	T	T	--	--	F	NS	--	T	--	--	T
82	--	T	T	--	--	T	--	F	T	--	T	--	--	F
83	--	T	NS	--	--	T	--	F	T	--	T	--	--	F
84	--	T	F	--	--	T	--	F	T	--	T	--	--	F
86	--	T	T	--	--	T	--	NS	T	--	T	--	--	T
87	--	T	T	--	--	T	--	F	T	--	T	--	--	NS
88	--	T	T	--	--	T	--	F	T	--	T	--	--	F
90	T	--	--	T	T	--	--	F	T	--	T	--	--	T
91	--	T	T	--	--	T	--	F	T	--	T	--	--	T
92	--	T	T	--	--	T	--	F	F	--	T	--	--	T
95	--	T	T	--	--	T	--	F	T	--	T	--	--	F
96	--	T	T	--	--	T	--	F	T	--	T	--	--	F
97	--	T	F	--	--	T	--	F	T	--	T	--	--	F
98	--	T	T	--	--	T	--	F	T	--	T	--	--	T
99	--	T	T	--	--	T	--	F	T	--	T	--	--	F
101	--	T	T	--	--	T	--	F	T	--	T	--	--	F
103	--	T	T	--	--	T	--	NS	T	--	T	--	--	F
105	--	T	T	--	--	T	--	F	T	--	T	--	--	F
107	--	T	T	--	--	T	--	F	T	--	T	--	--	F
108	--	T	T	--	--	T	--	F	T	--	T	--	--	F
109	--	T	T	--	--	T	--	F	T	--	T	--	--	T
110	--	T	T	--	--	T	--	F	T	--	T	--	--	F

Table 10: cont.

P_Id	d_fantasy_t	d_not_fantasy_f	d_elements_t	d_not_elements_f	d_proficient_t	d_not_proficient_f	d_ingest_t	d_not_ingest_f	d_employment_t	d_not_employment_f	d_novel_t	d_not_novel_f	d_adept_t	d_inept_f
72	T	--	T	--	T	--	F	--	--	F	T	--	T	--
73	T	--	F	--	T	--	F	--	--	F	T	--	T	--
74	T	--	T	--	T	--	F	--	--	F	T	--	T	--
76	T	--	T	--	T	--	NS	--	--	F	T	--	T	--
77	T	--	T	--	T	--	NS	--	--	F	T	--	T	--
79	T	--	T	--	T	--	F	--	--	F	T	--	T	--
80	T	--	T	--	T	--	NS	--	--	F	T	--	T	--
81	F	--	F	--	F	--	T	--	--	F	NS	--	F	--
82	T	--	T	--	T	--	F	--	--	F		--	T	--
83	T	--	T	--	T	--	NS	--	--	F	T	--	T	--
84	T	--	F	--	T	--	NS	--	--	F	T	--	T	--
86	T	--	T	--	T	--	T	--	--	F	T	--	T	--
87	T	--	T	--	NS	--	NS	--	--	F	T	--	NS	--
88	T	--	T	--	T	--	NS	--	--	F	T	--	T	--
90	T	--	T	--	T	--	T	--	T	T	T	--	T	--
91	T	--	T	--	T	--	T	--	--	F	T	--	T	--
92	NS	--	T	--	T	--	T	--	--	F	F	--	T	--
95	T	--	T	--	T	--	F	--	--	F	T	--	T	--
96	T	--	T	--	NS	--	F	--	--	F	T	--	NS	--
97	T	--	T	--	T	--	NS	--	--	F	T	--	T	--
98	T	--	NS	--	T	--	F	--	--	F	NS	--	T	--
99	T	--	T	--	T	--	NS	--	--	F	T	--	T	--
101	T	--	T	--	T	--	NS	--	--	F	T	--	F	--
103	T	--	F	--	F	--	NS	--	--	NS	T	--	NS	--
105	T	--	T	--	NS	--	NS	--	--	F	NS	--	NS	--
107	T	--	T	--	T	--	NS	--	--	F	T	--	NS	--
108	T	--	F	--	F	--	F	--	--	F	T	--	T	--
109	T	--	T	--	T	--	F	--	T	T	T	--	F	--
110	T	--	T	--	T	--	F	--	--	F	T	--	T	--

Table 10: cont.

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P_Id	d_malfunction_t	d_not_malfunction_f	d_discordant_t	d_consensus_f	d_statistics_t	d_not_statistics_f	d_reticent_t	d_enthusiastic_f	d_ambitious_t	d_unambitious_f	d_enthusiastic_t	d_apathetic_f	d_software_t	d_hardware_f
72	--	F	--	T	--	T	--	F	T	--	NS	--	T	--
73	--	F	--	NS	--	F	--	NS	T	--	T	--	T	--
74	--	F	--	F	--	F	--	F	NS	--	T	--	T	--
76	--	F	--	F	--	F	--	F	T	--	T	--	T	--
77	--	F	--	F	--	F	--	F	T	--	T	--	T	--
79	--	T	--	T	--	F	--	F	T	--	T	--	T	--
80	--	F	--	F	--	F	--	F	NS	--	T	--	T	--
81	--	F	--	T	--	T	--	F	F	--	NS	--	T	--
82	--	F	--	F	--	T	--	F	T	--	T	--	T	--
83	--	F	--	F	--	T	--	F	NS	--	T	--	T	--
84	--	F	--	F	--	F	--	F	T	--	T	--	T	--
86	--	T	--	F	--	T	--	F	NS	--	T	--	T	--
87	--	F	--	F	--	NS	--	F	T	--	NS	--	T	--
88	--	F	--	F	--	T	--	F	T	--	T	--	T	--
90	--	F	--	F	--	F	--	F	T	--	T	--	T	--
91	--	F	--	F	--	F	--	F	T	--	T	--	T	--
92	--	F	--	F	--	T	--	F	F	--	T	--		--
95	--	F	--	F	--	F	--	F	T	--	T	--	T	--
96	--	F	--	F	--	F	--	F	T	--	T	--	T	--
97	--	T	--	F	--	NS	--	F	T	--	T	--	T	--
98	--	F	--	F	--	F	--	F	T	--	T	--	T	--
99	--	F	--	F	--	F	--	F	T	--	T	--	T	--
101	--	T	--	F	--	F	--	F	T	--	T	--	T	--
103	--	T	--	F	--	NS	--	F	T	--	T	--	NS	--
105	--	F	--	F	--	F	--	F	T	--	T	--	T	--
107	--	F	--	F	--	F	--	F	T	--	T	--	T	--
108	--	F	--	F	--	F	--	F	T	--	T	--	T	--
109	--	T	--	F	--	F	--	F	T	--	T	--	T	--
110	--	F	--	F	--	F	--	F	T	--	T	--	T	--

Table 10: cont.

P_Id	d_dabble_t	d_milliner_f	d_lease_t	d_buy_f	d_collaborate_t	d_not_collaborate_f	d_physical_t	d_chemical_f	red_flower_wings	seahorse_useful_tool	marmoset_sea	connector_metal	cord_fasten	dragfly_fly
72	--	F	--	F	T	--	--	T	F	--	F	T	T	T
73	--	F	--	F	T	--	--	F	F	--	T	NS	T	T
74	--	F	--	F	T	--	--	T	F	--	F	F	T	T
76	--	F	--	F	T	--	--	T	T	--	F	T	T	T
77	--	NS	--	F	T	--	--	T	F	--	NS	T	T	T
79	--	F	--	T	T	--	--	F	F	NS	F	T	T	T
80	--	F	--	F	T	--	--	T	F	F	F	NS	NS	T
81	--	F	--	F	T	--	--	T	F	--	T	F	T	T
82	--	F	--	NS	T	--	--	F	F	F	F	NS	T	T
83	--	F	--	NS	T	--	--	F		F	F	T	T	T
84	--	F	--	NS	T	--	--	F	F	F	F	T	F	T
86	--	F	--	NS	T	--	--	T	NS	NS	NS	NS	T	T
87	--	F	--	F	T	--	--	T	NS	NS	F	T	NS	F
88	--	F	--	F	T	--	--	T	NS	NS	T	T	NS	T
90	--	F	--	F	T	--	--	F	F	--	NS	NS	T	T
91	--	F	--	T	T	--	--	F	F	F	F	NS	T	T
92	--	F	--	F	T	--	--	F	F	F	F	T	T	T
95	--	F	--	NS	T	--	--	T	NS	F	F	T	NS	NS
96	--	F	--	NS	T	--	--	NS	F	F	NS	NS	NS	NS
97	--	NS	--	NS	T	--	--	F	NS	NS	F	T	NS	T
98	--	F	--	F	T	--	--	T	F	F	F	T	T	T
99	--	F	--	F	T	--	--	T	F	F	F	F	F	T
101	--	F	--	NS	T	--	--	T	F	F	F	T	F	T
103	--	F	--	NS	T	--	--	F	F	F	T	T	NS	T
105	--	F	--	F	T	--	--	NS	F	F	F	T	T	T
107	--	F	--	F	T	--	--	T	F	F	F	T	T	T
108	--	T	--	NS	T	--	--	T	F	F	NS	F	NS	T
109	--	F	--	F	T	--	--	F	F	F	F	T	F	T
110	--	F	--	NS	T	--	--	F	F	F	NS	NS	NS	T

Table 10: cont.

2. COMMENTS (NUMBERS REFER TO PARTICIPANT IDS):

9   The study was interesting, and seemed focused on remembering the pictures, with the stories acting as filler

10   I think this study has to do with how people perceive half-completed tasks. For example I consider a half eaten sandwich eaten, but a half-installed computer program not installed.

11   Reading comprehension and retention with distraction

12   It was an interesting study and if I had to guess what its about I guess memorization of details relating to pictures and reading

13   Thank you for an interesting study. It was well designed and the instructions were clear. I enjoyed it. Thank you. The study was about memorization of a new language.

14   I guess the survey was about remembering pictures and weird names that go with the pictures. Either way this survey was way too long for the small pay.

15   I think that this study was about how people remembered information they read.

16   Cup of water question was hard to answer, since technically part of it froze. The study was about memory and distraction, and patience.

21   I think maybe the study was trying to see if concentrating on photos with unique descriptions would force someone to read and concentrate on a paragraph of facts more. It was really a challenge to try to tell myself a photo was something other than what it really was.

22   I think that it was related to how we look at different words in different context. Also, I noticed quite a few "half full/half empty" scenarios as well.

26   I think the study was about memory, and to some extent, perception of story meanings. Some of the wording of the questions were tricky to answer because they asked a question like "Did the girl make a hat" when, in this example, she STARTED to make a hat, but ran into difficulty and quit.

27   I think this hint was about memory and recall. It was too long.

28   I think the study was about retaining the meanings of odd words.

31   perceptions of interpreting language.

32   memory of the unique names of the items in the pictures, reading comprehension and vocabulary in the stories. judging what happens next

33   It was a good survey. I guess it was about how we understand situations.

34   The study was interesting, I thought. I think it was about my ability to retain new information in the midst of distractions?

35   I'm not too sure why I had to remember the fake names associated with certain images, but the way I did it was to take the first and last letter of the nonsense word and create a mnemonic that would help me remember what it was supposed to mean.

36   I think this study is about memory and visual ability. I think the researchers are trying to find out what a person can remember from visual images and text.

37   Not sure. Possibly being able to attach a meaning to abstract pictures and draw accurate conclusions based on limited contextual information.

38   Very interesting. I would guess that it had more to do with remembering the objects and nonsense titles underneath them.

39   if i would forget the names of the objects i was shown if i answered the questions maybe. i'm not really sure

40   I think that it had to do with memory possibly? The pictures and the garbled words seemed to be geared towards seeing how well a subject could remember them after reading paragraphs and answering questions. On some of the questions, I had a difficult time for example if Susan had started to make a hat, but didnt' complete it. She worked on making a hat, this is true, but she didn't succeed in making one. Questions like these, I entered false.

41   I enjoyed learning new words. Some of the questions were difficult to answer because in the scenario things were often done but not completed. I could not tell what the oedyui was made of but I remembered what it was. It was hard to tell what the study was about. It had something to do with language acquisition and logical analysis, I believe. There was a typo (the for them) in one of the stories. I thought this study was relatively fun to do. I enjoyed noting whether the actors had success in their relative endeavors or not. That telescope kit fiasco might have been solved by trying the screws that were to large for the view-finder in the eyepiece, and vice versa. I find it rather

frustrating writing my 200 character comment in such a tiny little letter box. My overall reaction to the study is positive. Thanks for the money.

42   I tried to figure out what this study was to accomplish. Reading comprehension, cognition, and word familiarity. Not sure if it was for that or not. The photos did not load fully. I would have to refresh most of the pages with the photos and still only about 3/4 would load but, it was enough for me to figure out what the picture was. I liked learning the different names for different things especially the meerkats being called dennucks. I hope that I was able to help your study.

43   Sequencing is important as an assist to memory. Made-up words paired with strange pictures are difficult to recall, but actions in a sequence, as in the stories, are much, much easier to remember.

44   I thought this was boring. I assume it's about memory.

45   this was easy, but tedious. it must have something to do with memory.

46   It was interesting

47   something about memory recall is my guess.

48   I thought the parts where you had to read the boring stories sucked, but the pictures with the wrong names were interesting. At least they spiced things up a bit. I think that the study was about memory and association.

49   This study was interesting. Remembering what the pictures were became more difficult as the study went on. I am not sure what this study was about.

50   Interesting study! I think it was about whether you consider something to have been done when it was half completed; eg, the man who read just over half the sci-fi novel: Would you say he read that book?

51   It was interesting to have the pictures with the made up names interspersed with the stories. I suspected taht we were to learn the names of those pictures?! Or maybe it was to see if we were at all impacted by the pictures before reading the storis?

53   Interesting scenarios. I am guessing this study is about linguistic and memory?

55   Thanks for the opportunity to participate. I think the study was about "half-finished" events and how people communicate / describe those events.

57 I realize late into it that a lot of the people did not finish what they started. for example the person who read part of a book. then you asked did they read the book. well no they read 1/2 the book. so i hope i helped

58 Wow, that was a bit of a challenge. My guess is that you are measuring how well people remember new information when they are also required to make a thoughtful decision, as in the answers about the stories. For some of the scenarios, I could answer firmly that the character completed a task. For others, it was less clear, and required a personal judgment. Sure, the guy painted the barn, but he did not complete the barn painting job. Very interesting. I almost did not remember dennucks, but my brain came through for me!

60 The study was about how people perceive something happening; did it happen, did it fully complete the action or only partially? When is an action considered complete? It's about assuming things. The insect had wings, but I was not sure it could fly. That would be an assumption without more facts. All I saw was a picture of the insect. The water in the pan could have evaporated, but I didn't have all the facts proving what happened to the water. Someone could have poured out the water unbeknownst to the persons involved in the study. The possibilities are many. I can make judgments/decisions about things based on what I know at that point, but do I really have all the information to come to a full conclusion? No. This is why I despise jury duty and voting. I never feel like I have all the facts to make a sound decision. They can be misconstrued. I can only do my best and hope that no harm comes to anything that my judgments/decisions affect. And, because I'll never have all the facts when making a decision/judgment, I mess up more than I succeed.

61 I thought it was an OK study. Kinda lengthy. I think this study was about one's ability to recall information read, testing one's memory.

62 The study was about your reading comprehension.

63 My guess is that it is about distraction? Remembering the nonsense names of objects while concentrating on comprehension of the paragraphs? I would like to know what the study is about.

64 I thought the questions were okay. It was a little long for my tastes, though. The study was probably about how well people could remember nonsense words and what they meant while doing another task.

65 It was an interesting study, very different. I think it was about testing people's short and long term memory.

66   I think the study was trying to see if I had could remember what the photos were after being distracted by the scenerios in between.

67   This study seemed to be long. I believe the point of the stories were just a distraction to evaluating memory for the names of the items shown at the beginning.

68   I noticed the stories feature "half-finished" things and then asks if the subject "did" those things. Perhaps it's a way of assessing how individuals judge if something was "done" or not.

70   I thought the study was kind of strange. It seemed random and I didn't understand what the purpose was. I started to think maybe it was testing to see if I understood more complicated vocabulary and sentence structure, but I wasn't sure about that. It was just a guess.

71   I think this study is about memorizing "new" words that describe common objects. My memory was tested by having me read short stories then asking questions regarding the new words.

72   I was really intriqued by this survey. The unusual names of objects helped to stick them in my memory. The scenarios presented were also fun. I'm not sure what this experiment is about but must be some type of distraction ploy. Either that or a recall of earlier words vs a recall of just read materials.

73   George Zimmerman murdered Trayvon Martin. True or False?

74   I thought the study was interesting. I liked trying to remember the different names for dragonflys, hitches, seahorses etc. I think maybe the study had something to do with how people percieve an act that wasn't seen through to completion, although I cant see how that fits with the new names part.

76   The study might be about what I encountered as I progressed through it. In the beginning, I would mark things as True about what someone did, even if the person in the story didn't fully complete the task. Since they did do the task, I marked True, even though not completed. Later on, I started to give those a False, such as the guy preparing a spreadsheet for the report. Since he never finished it, I couldn't mark True that he made a report. Summary: Purpose of study was to see how I was interpreting questions and making assumptions based on the little knowledge I had of each situation.

77   It seems to me that the study was about comprehending new languages. We were shown several images with made up names, and then asked about them later. This seems like the focus of the study to me.

79   I was confused by this study because I didn't understand the point of the pictures named by nonsense words that came between the paragraphs.

80   The stories were interesting, in that they were just a few sentences about beginnings and endings. It was also interesting, in that I seemed to have learned a few new nouns. the study seemed to be about judging whether something not completed could be judged as completed. For instance, evaporation when some water remained, or "drank a cup" of coffee, when some coffee remained in the cup.

81   The names of the materials seemed rather weird but I thought it was rather easy and interesting with the different stories

82   Actually I thought it was interesting, although I don't think I perform well at it, as my vocabulary skills aren't up to par. I think it won't matter much as I think you were testing my memory capacity more.

83   I think the study was about testing memory of objects after the participant was distracted by mini-stories.

84   I thought the study was really long for the pay. I think it was more about us remembering the weird names for items then reading comprehension and that the paragraphs were distractions.

86   It was about comprehending stories and memory about pictures I had seen throughout and at the beginning.

87   I thought that the study was pretty enjoyable overall. I didn't understand what the pictures with the made up words were about but I think maybe it had something to do with testing memory.

88   The study seemed pretty easy but im assuming there were some trick questions in there.I did not get the point of the pictures.Im thinking they were used as a distraction to answering the questions.

90   I assume that the study sought to assess how well people remembered short term things (from each story) vs longer term things, the items with strange names that were displayed at the start.

91   This was an interesting survey - I particularly liked the fake words. It was a bit long tho. Sometimes I answered the person did it even tho he didn't finish other times not - I guess it depended on how much success he had before giving up

92   This study was about memory and reading comprehension. I thought this study was interesting.

95   I think that the study had something to do with memory--maybe how reading all of the stories affected one's memory of what the various pictures were labeled. I did not like the way some of the answers to the story questions were not cut and dry, and could be open to one's interpretation. I'm not sure if that was done intentionally, or if they were just poorly written questions. That was somewhat frustrating, and I'm not sure that I answered the questions the way that I would have had they been clearer.

96   The study itself was very interesting. It wasn't easy remembering the names of all the items in the images I was shown but I tired. It took longer than I had expected to read all the paragraphs because I was reading carefully and trying to remember all the details to answer the yes or no questions correctly. I believe maybe the paragraphs may have been distractions to see if I could still recall the names of the pictured items. If indeed they were distractions, they did the job very well. Overall I really enjoyed this task and would do it again given the chance.

97   The study was interesting and kind of confusing, I didn't feel like i always knew the right answers. I thought it might be about reading comprehension and judging ambiguous word meanings.

98   I feel this was about seeing if people were able to comprehend what they read. Also if they could remember different names for different objects that aren't the real name of the object. I thought this was an interesting study.

99   I don't know what the study was about but I really enjoyed doing it. I tried to think of a correlation between the photos and the stories but couldn't come up with anything except memory.

101   I believe this HIT qas about how people draw conclusions based on memory. I thought the study was easy and more fun than some others I took today.

103   I felt the study was methodically devised. I ultimately believe that the study was about memory and perceptions.

105   I'm not sure what the survey was about. I thought some of the items in the photographs had interesting names though.

107   I think the study was about how people interpret events. Some of the questions could be either true or false depending on how you look at the situation. For instance, did

someone build a house if they didn't finish it.

108   I think that this study was to test people's learning ability. For example when you gave new words to things.

109   The study was really interesting. Nothing like what I've done before. I think the study was memory skills with difficult titles or names.

110   It seems to be a study about attentiveness, to some extent. I couldn't figure out the purpose of the creative names for the things that looked like insects or a flower. Maybe it really was about reading comprehension.

Appendix E

ASL Experiment Video Scenes, Sentence Prompts, and Questions

Form A:

1   Scene 12: EAT SANDWICH (completed)
        SANDWICH, RAY EAT.
        Ray ate a sandwich.

        IN ROOM, ONE PERSON. (true distracter)
        There was one person in the room.

2   Scene 2: RUNNING
        RAY RUN.
        Ray was running.

        RAY, HIS SHIRT, RED. (true distracter)
        Ray's shirt was red.

3   Scene 23: FIND BOOK (completed)
        BOOK, RAY FIND.
        Ray found the book.

4   Scene 7: CATCH MOUSE (uncompleted)
        MOUSE, RAY CATCH.
        Ray caught the mouse.

        RAY, HAIR, WET. (false distracter)
        Ray's hair was wet.

5   Scene 4: SICK
        RAY SICK.
        Ray was sick.

6   Scene 24: READ BOOK (uncompleted)
        BOOK, RAY READ.
        Ray read the book.

7   Scene 5: DRAW PICTURE (uncompleted)
         RAY USE MARKER. (true distracter)
         Ray used a marker.

         PICTURE, RAY DRAW.
         Ray drew a picture.

8   Scene 1: WALKING
         RAY WALK.
         Ray was walking.

         RAY, SHOES, WHITE. (true distracter)
         Ray's shoes were white.

9   Scene 13: BREAK CRACKER (uncompleted)
         CRACKER, RAY BREAK.
         Ray broke the cracker.

         RAY NOT-REALIZE, CAT WALK-THROUGH-ROOM. (false distracter)
         Ray didn't realize, but there was a cat walking through the room.

10   Scene 21: MAKE BOX (completed)
         BOX, RAY MAKE.
         Ray made a box.

11   Scene 15: WRITE STORY (uncompleted)
         RAY, HIS LAPTOP, DELL. (false distracter)
         Ray's laptop was a Dell.

         STORY, RAY WRITE.
         Ray wrote a story.

12   Scene 28: SITTING
         IN ROOM, SEVERAL PEOPLE. (false distracter)
         There were several people in the room.

         RAY SIT.
         Ray was sitting.

13   Scene 17: TYPING
         RAY, HIS LAPTOP, MAC. (true distracter)
         Ray's laptop was a Mac.

RAY TYPE.
Ray was typing.

14   Scene 31: SIT-DOWN (completed)
RAY SIT-DOWN.
Ray sat down.

RAY, HEAVY-LIDDED(drowsy). (false distracter)
Ray was drowsy.

15   Scene 19: REPAIR TV (completed)
TV, RAY REPAIR.
Ray repaired the TV.

16   Scene 29: STANDING
RAY STAND.
Ray was standing.

Form B:

1   Scene 2: RUNNING
RAY RUNNING.
Ray was running

RAY, HIS SHIRT, RED. (true distracter)
Ray's shirt was red.

2   Scene 16: WRITE STORY (completed)
STORY, RAY WRITE.
Ray wrote a story.

RAY, HIS LAPTOP, DELL. (false distracter)
Ray's laptop was a Dell.

3   Scene 18: REPAIR TV (uncompleted)
TV, RAY REPAIR.
Ray repaired the TV.

4   Scene 8: CATCH MOUSE (completed)
MOUSE, RAY CATCH.
Ray caught the mouse.

RAY, HIS SHIRT, RED. (false distracter)
Ray's shirt was red.

5   Scene 28: SITTING
RAY SIT.
Ray was sitting.

IN ROOM, SEVERAL PEOPLE. (false distracter)
There were several people in the room.

6   Scene 20: MAKE BOX (uncompleted)
BOX, RAY MAKE.
Ray made a box.

7   Scene 14: BREAK CRACKER (completed)
CRACKER, RAY BREAK.
Ray broke the cracker.

8   Scene 6: DRAW PICTURE (completed)
RAY USE MARKER. (true distracter)
Ray used a marker.

PICTURE, RAY DRAW.
Ray drew a picture.

9   Scene 1: WALKING
RAY, SHOES WHITE. (true distracter)
Ray's shoes were white.

RAY WALK.
Ray walked.

10   Scene 29: STANDING
RAY STAND.
Ray was standing.

11   Scene 4: SICK
RAY SICK.
Ray was sick.

12 Scene 25: READ BOOK (completed)
BOOK, RAY READ.
Ray read the book.

RAY LAUGH. (false distracter)
Ray laughed.

13 Scene 30: SIT-DOWN (uncompleted)
RAY SIT-DOWN
Ray sat down.

RAY, SHIRT GRAY. (true distracter)
Ray's shirt was gray.

14 Scene 11: EAT SANDWICH (uncompleted)
RAY, HAIR WET. (false distracter)
Ray's hair was wet.

SANDWICH, RAY EAT.
Ray ate the sandwich.

15 Scene 22 FIND BOOK (uncompleted)
BOOK, RAY FIND.
Ray found the book.

16 Scene 17 TYPING
RAY TYPING.
Ray was typing.

RAY, HIS LAPTOP, MAC. (true distracter)
Ray's laptop was a Mac.

Appendix F

ASL Experiment Response Data

Participant ID	walk	run	sick	draw_pic_i	draw_pic_c	catch_mouse_i	catch_mouse_c	eat_cracker_i	eat_cracker_c	eat_sandw_i	eat_sandw_c	break_cracker_i	break_cracker_c
126	T	T	T	T	--	F	--	--	--	--	T	F	--
127	T	T	T	--	T	--	T	--	--	F	--	--	T
128	T	T	T	--	T	--	T	--	--	T	--	--	T
129	--	T	--	--	--	--	T	--	--	--	--	--	T
132	T	T	T	T	--	F	--	--	--	--	T	F	--
135	T	T	T	T	--	F	--	--	--	--	T	F	--
136	T	T	T	--	T	--	T	--	--	F	--	--	T
137	T	T	T	T	--	F	--	--	--	--	T	F	--
138	T	T	T	T	--	T	--	--	--	--	T	F	--
139	T	T	T	--	T	--	T	--	--	T	--	--	T
142	T	T	T	--	T	--	F	--	--	F	--	--	T
141	T	T	T	T	--	F	--	--	--	--	T	F	--

Table 11: *True/False/Not Sure* Judgments on Sentences Presented

Participant ID	write_story_i	write_story_c	typing	fix_tv_i	fix_tv_c	make_box_i	make_box_c	find_book_i	find_book_c	read_book_i	read_book_c	sitting
126	T	--	T	--	T	--	T	--	T	T	--	T
127	--	F	T	T	--	F	--	F	--	--	T	T
128	--	F	T	T	--	F	--	F	--	--	T	T
129	--	T	--	T	--	F	--	--	--	--	--	T
132	T	--	T	--	T	--	T	--	T	T	--	T
135	T	--	NS	--	T	--	T	--	T	T	--	T
136	--	F	F	T	--	F	--	F	--	--	T	T
137	F	--	T	--	T	--	F	--	T	F	--	T
138	T	--	T	--	T	--	T	--	T	T	--	T
139	--	F	T	T	--	F	--	F	--	--	T	T
142	--	T	T	T	--	F	--	F	--	--	T	T
141	T	--	NS	--	T	--	F	--	T	T	--	T

Table 11: cont.

Participant ID	standing	sit_down_i	sit_down_c	shoes_white	shirt_red	use_marker	shirt_gray	laptop_dell	laptop_mac	cat_walk_by	drowsy	laugh
126	T	--	T	T	T	T	--	NS	NS	NS	NS	--
127	T	F	--	T	T	T	T	NS	T	--	--	F
128	T	F	--	T	T	T	T	F	T	--	--	F
129	--	--	--	--	T	--	--	F	--	--	--	F
132	T	--	F	T	T	T	--	F	T	NS	F	--
135	T	--	T	T	T	T	--	F	T	F	NS	--
136	T	F	--	T	T	T	T	F	T	--	--	F
137	T	--	T	T	NS	T	--	F	NS	NS	NS	--
138	T	--	T	NS	T	T	--	NS	T	NS	NS	--
139	T	F	--	T	T	T	T	F	T	--	--	F
142	T	F	--	T	T	T	T	NS	T	--	--	F
141	T	--	T	T	NS	F	--	NS	T	F	F	--

Table 11: cont.

Participant ID	cough	in_room_one_pers	in_room_sev_people	hair_wet
126	--	T	F	F
127	F	--	F	F
128	F	--	F	F
129	--	--	F	--
132	--	T	F	F
135	--	T	F	F
136	F	--	F	F
137	--	T	F	F
138	--	T	NS	NS
139	F	--	F	F
142	F	--	F	F
141	--	T	F	NS

Table 11: cont.

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