Semantic Interpretations of Ditransitive Constructions in English

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ABSTRACT
This study addresses claims made by two theories—the Alternative Projection and Verb Sensitive approaches—regarding an interpretation of possession attributed to certain ditransitive constructions. The Alternative Projection approach argues that an interpretation of possession is only available in the double object (DO) pattern expressed by English ditransitive verbs (**1a**) and is not available in the prepositional (PP) pattern (**1b**). The Verb Sensitive approach argues that this possession interpretation is either available for both the DO and PP patterns, or for neither pattern, depending on the class of ditransitive verb with which the patterns occur.
(**1a**) The salesperson gave the young farmer the grain mixture.
(**1b**) The salesperson gave the grain mixture to the young farmer.
Both approaches posit a possession interpretation of the DO pattern across all ditransitive verbs. This study tests to what degree native English speakers interpret a meaning of possession from the DO and PP patterns through an online survey with 88 participants. Ditransitive verbs from five semantic classes are analyzed to determine if the interpretation of possession varies based on use of the DO or PP pattern (Alternative Projection) or by the semantic class of the verb (Verb Sensitive). The results do not support the Alternative Projection approach. The results suggest partial support for the Verb Sensitive approach, as semantic classes do not entirely follow the pattern predicted by this approach. Further, judgements reported in this study contradict some judgements reported in the literature, highlighting the importance of quantitative studies in evaluating theoretical claims.

KEYWORDS
Ditransitives in English; Ditransitive Verbs; Survey; the Dative Alternation; Semantics; Verb Semantics; Alternative Projection approach; Verb Sensitive approach

INTRODUCTION
Ditransitives are a type of verb which allow two complements. In English, many, though not all, ditransitive verbs exhibit a behavior known as the dative alternation in which the order of the complements following the verb may alternate.[1–3] The two complements in ditransitive constructions have different functions; there is the *theme* and the intended *recipient* of that theme.[3] In (**1a**), the recipient (*the young gymnast*) precedes the theme (*some practice equipment*), and both complements are expressed as noun phrases. This contrasts the reversed order of the complements in (**1b**), where the recipient, now expressed through a prepositional phrase headed by the preposition *to*, follows the theme, which is still a noun phrase.

(**1a**) The retiring athlete sold the young gymnast some practice equipment[A].
(**1b**) The retiring athlete sold some practice equipment to the young gymnast.

The ditransitive construction represented in (**1a**) is known as the double object (DO) pattern and the construction represented in (**1b**) is the prepositional (PP) pattern. Verbs that allow both the pattern in (**1a**) and (**1b**) exhibit the dative alternation. This terminology is used for English, even though there is no morphological dative case in English.

While ditransitive verbs are attested cross-linguistically,[4] the dative alternation is less widespread.[5] In a study conducted by Siewierska (1998), only around 6% of the 219 languages sampled had the dative alternation. The exact expression and scope of the dative alternation is contingent upon language-specific features.[4] For instance, some languages have only a small number of ditransitive verbs, while other languages, such as English, possess an extensive class of ditransitives.[4] In addition to language-specific features, there are a number of factors that are attested across different languages to impact both speakers' choice

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[A]Uncited examples are experimental items from this study.

between the two patterns as well as the acceptability[B] of the two patterns.[6–8] Key factors influencing the dative alternation include characteristics of the complements such as their length and complexity, whether they are animate or not, and if they are new information to the speaker.[6, 9] These factors may result in (1) an otherwise acceptable pattern becoming unacceptable when those factors are in effect and vice versa or (2) a seeming preference for one pattern over the other, even if both patterns are still acceptable. For instance, in cases such as (1) where both the DO and PP patterns are available, speakers still choose between which of the two patterns to use. What motivates speakers' choice of the DO or PP pattern? This is an area of extensive but inconclusive research. The *Introduction* provides a brief overview of the literature on key cross-linguistic factors that influence the availability as well as the usage of the DO and PP patterns, before a second, related question is discussed. Do the different patterns have different meanings? This question is the target of this study.

A set of correlated features of the complements—animacy, definiteness, pronominality, and given vs. new information—affect the order of the recipient and the theme relative to each other; and thus, which pattern speakers use.[6, 10] If one complement is more animate, definite, pronominal, and/or given (information already known to the speakers) than the other, it tends to precede it in the sentence.[11] In ditransitive constructions more broadly, recipients tend to be animate, if not human, and given information, while themes are frequently inanimate, new information.[12, 13] This behavior favors the word order of the DO pattern. Indeed, in a corpus study by Bresnan et al. (2007), DO constructions were found to be eight times more likely than PP constructions to have given information before new information. Correspondingly, Bresnan (2007) reports that DO constructions with pronominal recipients occur at a higher frequency than those with full noun phrases (e.g. *a can of beer, John*) in corpus data. Studies on corpus data further suggest that speaker judgements do not always align with judgements reported in the theoretical literature, and that theoretical literature may not fully capture the range of constructions acceptable to speakers in more naturalistic environments.[10]

The animacy of the recipient has another effect on the acceptability of the DO pattern, as shown in (**2**), with the ditransitive verb *send*. In the PP pattern, the use of both the animate recipient *Sue* (**2a**) and the inanimate recipient *Philadelphia* (**2b**) results in acceptable sentences. However, the DO pattern is not acceptable with the inanimate *Philadelphia* (**2d**). The only interpretation in which (**2d**) becomes licit is one where *Philadelphia* is represents an organization or some other group of people—that is, an interpretation where *Philadelphia* is actually animate.[14]

(**2a**) The editor sent the article to Sue. (Harley, 2002: 7)
(**2b**) The editor sent the article to Philadelphia. (Harley, 2002: 7)
(**2c**) The editor sent Sue the article. (Harley, 2002: 7)
(**2d**) ?The editor sent Philadelphia the article. (Harley, 2002: 7)[C]

Harley (2002) attributes the unacceptability of an inanimate recipient in the DO construction to a difference in meaning between the two patterns, wherein the DO pattern has a meaning of possession, and the PP pattern has a meaning of motion. Both animate and inanimate recipients are compatible with the meaning of motion in the PP pattern; however, successful transfer of possession, as argued to be encoded by the DO pattern, requires an animate recipient. That is, the physical entity of the city of Philadelphia is incapable of possessing *the article*. Harley (2002) attests this distinction between the DO pattern introducing a meaning of possession and the PP pattern introducing a meaning of motion across all ditransitive verbs that allow the dative alternation. This approach is known as the Alternative Projection approach.[14–16]

A paper by Rappaport Hovav and Levin (2008), however, notes different behavior in ditransitive constructions with regards to the meaning of possession. For instance, Rappaport Hovav and Levin (2008) and Beavers (2011) point out the following pattern of behavior for the verb *give* and for other verbs within the same semantic class of ditransitives (*hand, lend, loan,* etc.): when both the DO pattern (**3a**) and PP pattern (**3b**) are followed by a clause denying a successful transfer of possession of the theme to the recipient, the sentence is less acceptable. This suggests that, at least for this set of ditransitive verbs, ditransitive constructions with both the DO and PP pattern have a meaning of possession. This approach is known as the Verb Sensitive approach.[2–3]

(**3a**) #John gave/handed Mary the salt, but he dropped it before she got it. (Beavers, 2011: 10)
(**3b**) #My aunt gave/lent/loaned some money to my brother for new skis, but he never got it. (Rappaport Hovav and Levin, 2008: 37)

[B]Acceptability is a distinct metric from grammaticality. Acceptability differs from grammaticality in that it is a measure of speakers' performance of a language and is directly testable. Speakers' judgements on the acceptability of items inform grammaticality, which concerns the abstract rules that make up a language. This study tests the *acceptability* of ditransitive constructions but not the grammaticality.
[C]The (?) and (#) in front of an item indicate respectively that the item is not fully licit or is ill-formed. An (*) in front of an item indicates a fully unacceptable item that violates the rules of a language's grammar.

Notably, the unacceptability of (**2d**) and (**3**) occurs when the givenness and complexity of the complements are controlled for, indicating that variations in those features cannot account for this unacceptability.

Both the Alternative Projection and Verb Sensitive approaches agree that certain ditransitive constructions have a meaning of possession; however, they diverge in regard to the source of the possession meaning. Namely, the Alternative Projection approach argues that a possession interpretation stems from the DO pattern and is thus available only in this pattern, whereas the Verb Sensitive approach argues that the possession interpretation stems from the verb and is such either available for both the DO and PP patterns or available for neither pattern depending on the ditransitive verb that the patterns occur with. That is, according to each theory respectively, either the DO and PP constructions pattern differently regarding a meaning of possession, or different classes of ditransitive verbs pattern differently in regard to a meaning of possession.

There is a difference as well in the scope and means of argumentation between the Alternative Projection and Verb Sensitive approaches. The Alternative Projection approach posits that the difference in meaning between the DO and PP patterns is determined by their different structures.[16] This is a primarily syntactic distinction, and studies under the Alternative Projection approach often concentrate on determining the syntactic structure of the DO and PP constructions.[14–16] As the Verb Sensitive approach attributes the entailment of possession to the core meaning of the verb, it more so focuses on the semantics of ditransitive constructions.[2–3] The orientation of both of these studies, however, is primarily theoretical in nature, and as such, neither of these studies provides quantitative results as to the entailment of possession in patterns or verb classes.

Indeed, many approaches to verb meaning in linguistics posit a distinction between the core meaning of the verb, which applies to all uses of that verb regardless of context, and the meaning of the construction representing the event, in this specific case, the DO and PP patterns.[2, 17] Under both the Alternative Projection and Verb Sensitive approaches, the inherent meaning of the DO construction by itself is possession. However, in the Verb Sensitive approach, the possession encoded by the DO pattern is actually *prospective* possession, meaning that possession of the theme by the recipient only needs to obtain in some possible worlds, not necessarily the actual world. Rather, in the Verb Sensitive approach, certain verbs, whose core meaning entails actual possession, subsume the independent meaning of the DO and PP pattern, such that when the DO and PP patterns occur with this given verb, both patterns have an interpretation of actual, obtained possession.[3] These two approaches further diverge with respect to the meaning of the PP pattern. While the Alternative Projection approach argues that the PP pattern has a meaning of motion, the Verb Sensitive approach expands on the potential meanings of the PP pattern to be motion or possession. The availability of these interpretations depends on which class of ditransitive verb the PP pattern occurs with. Notably, this meaning of possession in the PP pattern is only ever prospective; under the Verb Sensitive approach, actual entailment of possession, such that its denial is infelicitous with the meaning of the entire ditransitive construction, stems only from the verb itself. Further, the Alternative Projection approach is not uniform in its claims on the meaning of the two patterns. While Harley (2002) and Krifka (1999), among others, attest that the DO construction entails actual possession,[17] Harley and Jung (2015), a later paper under the Alternative Projection approach, adopts the proposal from Beavers (2011) that the possession meaning of the DO pattern is solely prospective, and thus can be denied. This study focuses on the claims made by earlier papers under the Alternative Projection Approach, such as Harley (2002) and Krifka (1999), although there is further discussion of Harley and Jung (2015) in the *Discussion*.

Building on existing English verb classification schemes developed by Pinker (1989) and Levin (1993), the Verb Sensitive approach groups ditransitive verbs into semantic classes based on the general meaning they have. This study focuses on five semantic classes drawn from Rappaport Hovav and Levin (2008) and Beavers (2011), both papers arguing in support of the Verb Sensitive Approach: Giving, Future Having, Communication, Instrument of Communication, and Motion. The meaning of the DO and PP patterns for a given verb depends on which of these five classes the verb belongs to. For verbs in the Giving class only, the inherent possession meaning of the verb subsumes the independent meaning of the DO and PP constructions. Although the exact meaning of a verb varies, verbs in the Giving category all inherently signify acts of giving. None of the remaining classes of verbs inherently entail a meaning of successful possession.[2, 3] Verbs in the Future Having class signify acts of *future* giving or possession, and verbs in the Communication class are verbs of communicated message. Instrument of Communication verbs have a meaning of communicated message through a specific instrument (a phone, fax machine, *etc.*) and Motion verbs have a meaning of sending motion or an instantaneous causation of ballistic motion.

This study targets arguments made by the Alternative Projection and Verb Sensitive approaches that in certain ditransitive constructions a meaning of possession is entailed. Specifically, this study tests whether the DO pattern entails possession while the PP pattern does not or whether Giving verbs entail possession for both patterns while other classes do not. The aims are twofold. First, judgements reported in the literature by Rappaport Hovav and Levin (2008) and Beavers (2011) are checked through experimental methodology to see if they are corroborated by speakers. The second goal is to ascertain which theoretical approach best accounts for variation in pattern in English ditransitives. Participants went through a two-step process of rating experimental items in an online survey. First, they rated a ditransitive construction with either the DO or PP pattern. Then, they were prompted with a clause that denies any potential transfer of possession that could be entailed in the ditransitive construction

(either through the verb or the DO pattern). Speaker judgements on the ditransitive constructions from the first set of experimental items are predicted to conform to attested acceptability judgements from the literature**.** However, participants' judgements on the acceptability of the second set of experimental items is the target of the core research question. If the data are in line with the Alternative Projection approach, and the DO pattern entails possession while the PP pattern does not, the behavior detailed in (**4**) is expected. If the Verb Sensitive approach holds true, however, the data should exhibit all of the three behaviors described in (**5**). As the Verb Sensitive approach argues for an analysis of ditransitives based on the class of ditransitive verb, analyzing ditransitives by their category rather than solely as individual verbs allows us to test the Verb Sensitive approach in addition to the Alternative Projection approach.

(**4**) Denial of Possession will not be possible following the DO pattern, since the DO pattern entails possession, and the PP pattern has a meaning of motion.
(**5a**) Denial of possession will not be possible after both the DO and PP patterns in the Giving class.
(**5b**) Denial of possession will be possible following both the DO and PP patterns in the Future Having, Communication, Instrument of Communication, and Motion classes.
(**5c**) Denial of possession after both the DO and PP patterns will be rated significantly worse in the Giving class than in the Future Having, Communication, Instrument of Communication, and Motion classes.

Notably, for there to be sufficient evidence to fully support the Verb Sensitive approach, all three predictions must be attested in the data.

METHODS AND PROCEDURES

Eight-eight participants between the ages of 18 and 35 took part in an online survey administered through Qualtrics. All participants were native English speakers and had not taken linguistics classes. Upon completion of the survey, participants were compensated with a $20 gift card. The experimental design consisted of two steps: an initial set of ditransitive sentences and a follow-up set of denial of possession clauses. Participants were first presented with a ditransitive clause, containing either a DO construction or a PP construction. Participants rated the acceptability of this initial sentence on a 1-7 Likert scale. If participants rated the sentence as a 4 or higher, they were prompted with a follow-up clause denying any potential transfer of possession entailed in the initial ditransitive sentence. The follow-up clause was not ditransitive. The overall structure of the initial item and the follow-up item (underlined) is shown for the DO pattern (**6a**) and PP pattern (**6b**).

(**6a**) Nicolas handed his baby sister a giant lollipop… but their dad snatched it away before she could grab it, and the little girl looked longingly at the lollipop.
(**6b**) Nicolas handed a giant lollipop to his baby sister… but their dad snatched it away before she could grab it, and the little girl looked longingly at the lollipop.

In order to ensure that the participants rated the denial of possession clause as a continuation of the initial ditransitive construction, the initial item was presented along with the follow-up item in the prompt, and participants were specifically instructed to rate how natural they found the follow-up clause as a continuation of the initial item. Participants were also given practice items at the beginning of the survey. The online survey consisted of 30 target items, counting the initial ditransitive sentence and its follow-up as a single unit. As the Verb Sensitive approach focuses on the behavior of classes of ditransitives, 30 ditransitive verbs evenly distributed across five semantic classes were tested, adapted from Rappaport Hovav and Levin (2008) and Beavers (2011). These classes are Giving, Future Having, Communication, Instrument of Communication, and Motion (**Table 1**). Further, the experimental items were constructed in a similar format to examples from Rappaport Hovav and Levin (2008) and Beavers (2011), so as to test if those judgements are corroborated by speakers (see (**3**)).

Giving (G) - *Hand, Give, Lend, Sell, Rent, Pay*
Future Having (FH) - *Offer, Grant, Owe, Promise, Allocate, Bequeath*
Communication (COM) - *Show, Write, Teach, Tell, Explain, Announce*
Instrument of Communication (IC) - *Email, Email.2, Text, Text.2, Telegraph, Fax*
Motion (M) – *Send, Send.2, Forward, Kick, Toss, Throw*

Table 1. Semantic classes of ditransitive verbs based on Rappaport Hovav and Levin (2008) and Beavers (2011).

Each ditransitive verb in the survey had two separate entries: one with the DO pattern and one with the PP pattern. For a given ditransitive verb, participants were presented with either the DO pattern or the PP pattern. That is, no single participant was presented with both patterns for the same verb. In total, participants encountered 15 DO constructions and 15 PP constructions. The order of the experimental items was randomized for each participant. This survey tested the relative acceptability of each pattern. As a given participant only viewed one pattern per verb, data on the preference of one pattern over the other could not be gathered. Animacy and pronominality, known factors impacting the usage and acceptability of both patterns, were controlled for.[6, 9, 18] All themes were inanimate, all recipients were animate, and no recipient or theme was a pronoun. All ditransitive verbs in

the survey were conjugated in the simple past. In addition to the 30 target items and their corresponding denial of possession clauses, 50 filler items were interspersed throughout the survey. These filler items consisted of various non-ditransitive sentences whose judgements by native speakers are consistent and clearly established. They were a mix of grammatical or ungrammatical as well as plausible or implausible sentences. The filler items served as a check to determine if a participant was defaulting to a certain rating throughout the survey or offering judgements without fully reading the item, and to accordingly allow the removal of that participant's responses from the analysis. A one-way ANOVA was run through Python; p-values below 0.05 were considered statistically significant.

This study is part of a larger study investigating Icelandic and Faroese ditransitives, with English ditransitives used for comparison, and experimental items were the same across all three languages. Acceptability judgements collected on the initial ditransitive sentences serve two key purposes: (1) to prevent participants who disliked a ditransitive construction from rating the follow-up, and (2) to gather parallel information on all three languages. As Icelandic and Faroese ditransitives are understudied, information on acceptability judgements is particularly crucial. However, the data from English acceptability judgements also yield intriguing findings contributing to the literature. To facilitate this parallel methodology, the verbs *send* (COM), *text* (IC), and *email* (IC) in the English survey had two entries. This is because there are not enough unique verbs in these verb classes in Icelandic and Faroese, so multiple entries for individual verbs were created to ensure an equal number of experimental items in each semantic class. Due to the understudied nature of Icelandic and Faroese ditransitives, further research calibrated to those languages has been conducted.

RESULTS
Initial Ditransitive Sentences
The results support the literature which attests that the dative alternation occurs in this set of ditransitive verbs. Two semantic classes exhibited a significant difference in ratings between the DO pattern and the PP pattern for the initial ditransitive sentences. Participants rated the DO pattern significantly lower than the PP pattern with $p < 0.001$ in both the Communication and the Motion classes (**Figure 1**). The PP pattern was rated significantly higher for six individual verbs: *tell*, *explain*, and *announce* in the Communication class; *kick* and *toss* in the Motion class; *fax* in the Instrument of Communication class. The DO pattern was rated significantly higher for one verb, *show*, in the Communication class. No other verbs in the Communication and Motion classes exhibited a significant difference between patterns.
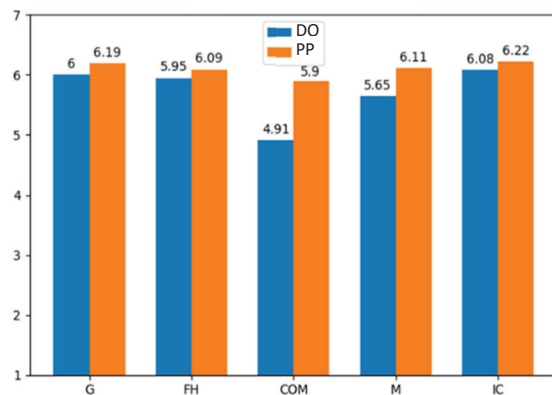

Figure 1. Average ratings of DO and PP patterns for each semantic class.

Follow-up Denial of Possession Clauses
Data from the follow-up denial of possession clauses do not support the Alternative Projection approach and provide partial support for the Verb Sensitive approach. Denial of possession after the DO construction was not consistently rated significantly lower across all the verbs tested. Participants rated the denial of possession clause following the PP pattern significantly lower in the Motion class ($p < 0.01$) (**Figure 2**). No other semantic classes exhibited a significant difference between the denial of possession after the DO and PP patterns. There were significant differences between follow-up ratings after the DO and PP patterns for some individual verbs. Denial of possession after the DO pattern was rated significantly worse for *hand* in the Giving class (**Figure 3**) and for *tell* in the Communication class (**Figure 5**). Denial of possession after the PP pattern was rated significantly worse for *owe* and *allocate* in the Future Having class (**Figure 4**). Denial of possession after the PP pattern was rated significantly worse for two verbs, *kick* and *throw*, in the Motion class (**Figure 6**). There was no significant difference in follow-up ratings between patterns for Instrument of Communication verbs as a class or for individual verbs within the class (**Figure 7**).

The average follow-up ratings after both patterns were lower than the average ratings for the initial experimental items, except for the DO pattern in the Communication class (**Figure 1, Figure 2**).
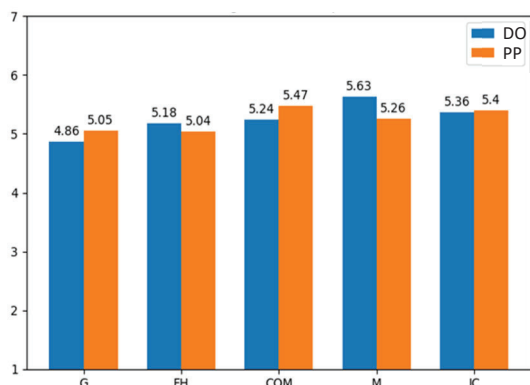

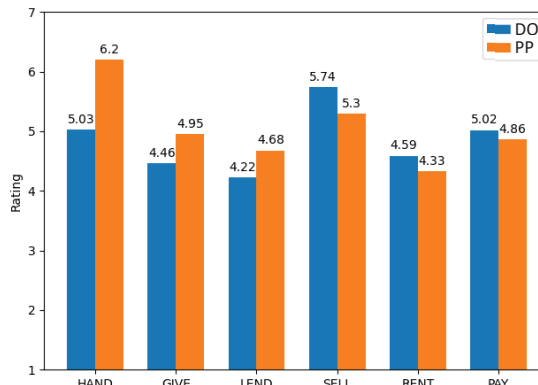**Figure 2**. Average ratings of denial of possession clauses following DO and PP patterns for each semantic class.

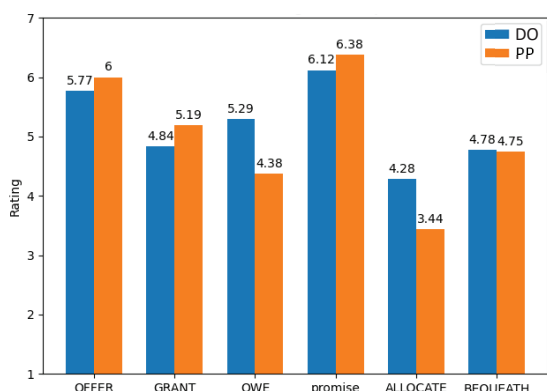**Figure 3**. Average ratings of denial of possession clauses following DO and PP patterns for Giving class.

Figure 4. Average ratings of denial of possession clauses following DO and PP patterns for Future Having class.
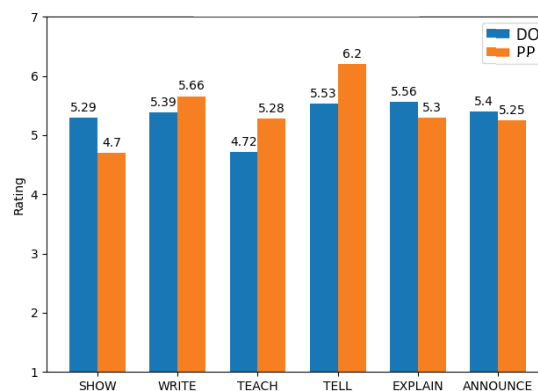

Figure 5. Average ratings of denial of possession clauses following DO and PP patterns for Communication class.
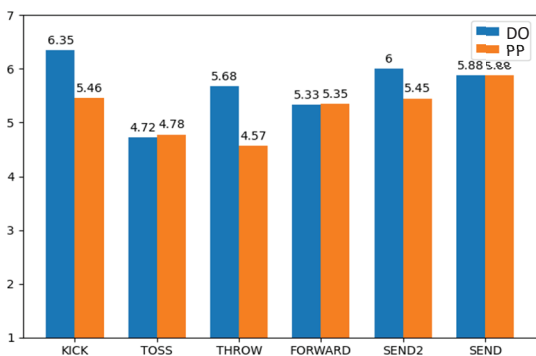

Figure 6. Average ratings of denial of possession clauses following DO and PP patterns for Motion class.
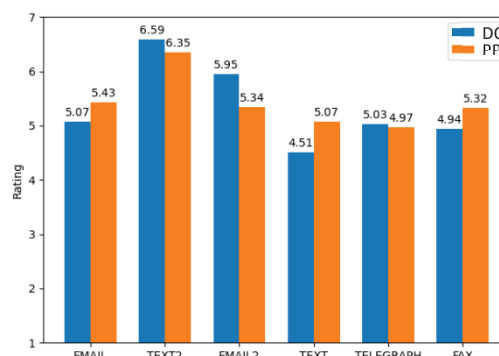

Figure 7. Average ratings of denial of possession clauses following DO and PP patterns for Instrument of Communication class.

DISCUSSION

Initial Ditransitive Sentences

The results do not indicate preference for either pattern, as an individual participant only encounters either the DO or PP pattern for a given ditransitive, but rather the relative acceptability of each pattern. On the whole, the results corroborate the literature which attests that the dative alternation occurs in this set of ditransitive verbs.[2] For two verbs in the Communication class, *explain* and *announce*, the PP pattern is rated significantly higher than the DO pattern ($p < 0.001$). *Explain* and *announce* do not undergo the dative alternation; the inclusion of these verbs in the survey served as an internal check to assess the reliability of participant

responses. Although two out of the five semantic classes displayed a significant difference in ratings between patterns, only four individual verbs within those categories exhibited a significant difference. These verbs were concentrated in the Motion class (*kick* and *toss*) and Communication class (*tell* and *show*); *fax* (IC) was the only verb with a significant difference in ratings between patterns whose overall class did not also have a significant difference (**7**) (average ratings in brackets).

(**7a**) The whistleblower faxed the government officials the confidential documents. [5.11]
(**7b**) The whistleblower faxed the confidential documents to the government officials. [5.93]

For only one verb *show* (COM), participants rated the DO pattern significantly higher than the PP pattern. No classes rated the DO pattern significantly higher. However, the ratings for the majority of the semantic classes and individual verbs examined do not significantly differ by pattern and the average ratings for both patterns are acceptable (4 and higher) with the exception of *kick* and *show*. The average rating of the DO pattern for *kick* was 3.64 and the average rating of the PP pattern for *show* was 4.11, both of which were lower than expected in verbs that exhibit the dative alternation.

This overall trend towards higher relative acceptability of the PP pattern is surprising, particularly in light of Stefanowitsch and Gries's (2003) claim of a strong association with the DO pattern for verbs such as *give*, *tell*, and *send* among others. Stefanowitsch and Gries (2003) use corpus data to calculate the frequency with which a given ditransitive verb co-occurs with a DO construction, and thereby the strength of the association between a ditransitive verb and the DO construction. Specifically, their methodology looked for the frequency of a verb in a DO construction in relation to frequency of that verb in all other constructions and frequency of all other verbs in the DO construction. Stefanowitsch and Gries (2003) do not explicitly test the association between these same verbs and the PP pattern; however, the overall strength of association with the DO found in their results does suggest that there should be a higher rating of the DO pattern than the PP pattern. However, in the results from this current study, the PP pattern is rated significantly higher than the DO pattern for *tell* ($p = 0.007$). While there is no significant difference for *give* and both experimental items for *send*, the average ratings for the PP patterns are higher for all three items. Despite the generally higher acceptability of the PP pattern in the data from this study, only a small percentage of verbs exhibit any significant difference between patterns.

Follow-up Denial of Possession Clauses
Ratings for the follow-up items vary extensively across the semantic class of ditransitive and by individual verbs within each class. This variation is not in line with the predictions of this study, as outlined in (**4**) and (**5**). The DO construction is not consistently rated significantly lower than the PP construction after denial of possession, and the DO and PP constructions do not pattern the same way across and within verb classes with respect to denial of possession. These patterns offer insight into which approach best fits the data.

Under the Alternative Projection approach, difference in structure results in difference in meaning, and the meanings of the DO and PP patterns generally do not overlap.[16] Only in one class, Motion, is there a significant difference between patterns with denial of possession rated significantly lower after the PP pattern ($p < 0.01$), suggesting that the PP construction was more strongly associated with possession than the DO construction. Thus, the results do not corroborate predictions from the Alternative Projection approach (see (**4**)).

According to the Verb Sensitive approach, for no class of ditransitive verb, nor individual verb, should there be any significant difference between the DO and PP constructions in terms of the acceptability, or lack thereof, of denial of possession. Verbs that entail possession, entail it for both constructions, and verbs that do not, entail possession for neither construction.[2–3] However, as the Verb Sensitive approach posits that different classes of ditransitive verbs pattern differently with respect to the entailment of possession, there should be a significant difference in acceptability of denial of possession between certain classes of verbs. Specifically, should the Verb Sensitive approach hold, the following patterns are expected (**5**).

(**5a**) Denial of possession will not be possible after both the DO and PP patterns in the Giving class.
(**5b**) Denial of possession will be possible following both the DO and PP patterns in the Future Having, Communication, Instrument of Communication, and Motion classes.
(**5c**) Denial of possession after both the DO and PP patterns will be rated significantly worse in the Giving class than in the Future Having, Communication, Instrument of Communication, and Motion classes.

The data from this study partially supports (**5b**). Denial of possession is possible after both the DO and PP constructions in the Future Having, Communication, Instrument of Communication, and Motion classes; however, the significantly lower ratings after the PP pattern in the Motion class are not in line with the predictions of the Verb Sensitive approach in (**5b**). This suggests that the PP pattern entails possession while the DO pattern does not, a behavior attested by neither the Alternative Projection nor the Verb Sensitive approaches. However, the data do not support the predictions in (**5a**) and (**5c**). Both (**5a**) and (**5c**) concern the behavior of the Giving class. Namely, both hypotheses target the claim that all verbs in the Giving class entail successful transfer

of possession, such that its denial is infelicitous with a key meaning component of the entire ditransitive construction, and that for this reason, any denial of that transfer is unacceptable.[2–3] Consequently, denial of possession should not be possible within this class (**5a**) and should be rated significantly lower after both patterns in the Giving class than in the other classes (**5c**). This is not supported by the data. The average ratings for denial of possession after the DO and PP patterns for the Giving class were 4.86 and 5.05 respectively (**Figure 2**), which do not meet the threshold for unacceptability of a rating of under 4. Further, denial of possession after both the DO and PP patterns was not rated significantly worse in the Giving class than in the Future Having, Communication, Instrument of Communication, and Motion classes (**Figure 2**).

The behavior of the Giving and Motion classes is unattested by either the Alternative Projection or Verb Sensitive approaches, and as such, merits a closer examination. While the behavior of both classes as a whole is surprising, individual verbs within these categories also deviate from the predictions of the Verb Sensitive approach[D]. In particular, denial of possession is rated significantly worse after the DO construction than after the PP construction for *hand* in the Giving class (p < 0.01). Not only is this not in line with the expected behavior of Giving verbs under the Verb Sensitive approach, but this explicitly contradicts examples from Beavers (2011). Namely, Beavers (2011) notes denial of possession to be unacceptable after both the DO (**8a**) and PP (**8b**) pattern for *hand*. Yet, in the results from this study, average ratings for both patterns remain high, particularly in the PP pattern (**9**; average ratings in brackets). Indeed, the average rating for the follow-up after the PP construction with *hand* is 6.2, which is markedly higher than the average ratings for either pattern for the other Giving verbs, and indeed, quite high for all verbs tested (**Figure 3**). This indicates that (1) the DO pattern seems to have more of an interpretation of possession than the PP pattern, and (2) there is a relatively high acceptability of denial of possession after the PP pattern.

(**8a**) #John gave/handed Mary the salt, but he dropped it before she got it. (Beavers, 2011: 10)
(**8b**) #Carla handed the money to Norm, but he never received it. (Beavers, 2011: 43)
(**9a**) Nicolas handed his baby sister a giant lollipop… but their dad snatched it away before she could grab it, and the little girl looked longingly at the lollipop. [5.03]
(**9b**) Nicolas handed a giant lollipop to his baby sister… but their dad snatched it away before she could grab it, and the little girl looked longingly at the lollipop. [6.2]

These judgements for *hand* contrast to the judgements for the rest of the verbs in the Giving category. There is some minor variation in the average denial of possession ratings for the remaining Giving verbs, with *sell* having slightly higher acceptance of denied possession than *rent*, which is on the lower end of denial of possession ratings for this class (**10**). Overall, with the exception of *hand*, Giving verbs have lower, but not unacceptable ratings, for denial of possession after both patterns.

(**10a**) The clerk at the help desk rented the American tourists a car… but their credit card was denied so that they had to leave without the rental car. [4.59]
(**10b**) The clerk at the help desk rented a car to the American tourists… but their credit card was denied so that they had to leave without the rental car. [4.33]

Similar verb-by-verb variation is attested in the results for the Motion class. While denial of possession after the PP pattern was rated significantly worse for two verbs, *kick* and *throw*, there was remarkably minimal variation between the average denial of possession ratings between the DO and PP constructions for the other Motion verbs (**Figure 6**). While the results for *kick* are potentially complicated by the low average rating of the initial DO construction at 3.64, only participants that judged an initial ditransitive construction as acceptable proceeded to rate the denial of possession follow-up. Further, Rappaport Hovav and Levin (2008) attest denial of possession after both patterns for *throw* as acceptable (**11**), since *throw* as a verb in the Motion class does not entail possession. However, the results of this study contradict this and indicate that denial of possession after the PP pattern is significantly worse than after the DO pattern (**12a**), and the average ratings for both constructions in (**12b**) are towards the lower end of the rating data.

(**11**) I threw the ball to Julian, but it fell short of him. (Rappaport Hovav and Levin, 2008: 34)
(**12a**) The excited little girl threw the cute dog a bouncy ball… but the ball ended up on the roof, so the dog never got his ball. [5.68]
(**12b**) The excited little girl threw the bouncy ball to the cute dog… but the ball ended up on the roof, so the dog never got his ball. [4.57]

Variation in the behavior of individual verbs is not unique to the Giving and Motion classes. Indeed, as mentioned in the *Results*, a number of verbs (*owe* and *allocate* in Future Having and *tell* in Instrument of Communication) also exhibit significant differences

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[D] This study was designed to evaluate the data based on overall patterns of constructions or verb classes, and as such, there is only a single entry per verb, with the exceptions of *send*, *text*, and *email*. Thus, any discussion of individual verbs, rather than overall semantic classes, is inherently limited.

between denial of possession judgements after the two patterns. Deviation of individual verbs from the predictions of both approaches is unexpected. This variation cannot be accounted for under the Alternative Projection approach, as the entailment of possession stems from the DO construction and is as such is invariant and independent of the verb. Another possible account is that, under the Verb Sensitive approach, entailment of possession is sensitive to individual verbs more so than, or in addition to, overall classes. Yet, if this were the case, even in verbs that varied in the meaning they entail, there would be no significant difference between the DO and PP patterns with regards to possession interpretations. Finally, both Harley and Jung (2015), in a revised Alternative Projection approach, along with Beavers (2011) and Rappaport Hovav and Levin (2008) argue that the DO pattern has a meaning of prospective possession. The behavior of *hand* and *tell*, wherein denial of possession is rated significantly worse after the DO construction, is incongruent with these claims.

Certainly, quantitative results from this study indicate that participant judgements on individual experimental items contradict claims made by Rappaport Hovav and Levin (2008) and Beavers (2011) regarding their acceptability. Despite these differences, participants' ratings of the follow-up clauses do correspond to some judgements reported in Rappaport Hovav and Levin (2008) and Beavers (2011). Denial of possession does not result in unacceptability for *send* regardless of the pattern both in Rappaport Hovav and Levin (**13**) and this study (**14**).

(**13a**) Lewis sent/shipped Sam a bicycle, but it never arrived. (Rappaport Hovav and Levin, 2008: 42)
(**13b**) Lewis sent/shipped a bicycle to Sam, but it never arrived. (Rappaport Hovav and Levin, 2008: 42)
(**14a**) The thoughtful managers sent the hardworking secretary a surprise birthday present… <u>but the mailman misplaced it, and the secretary never got her gift</u>. [5.88]
(**14b**) The thoughtful managers sent a surprise birthday present to the hardworking secretary… <u>but someone stole the package from the mailroom and the secretary never got her gift</u>. [5.88]

Indeed, as Bresnan (2007) notes, mismatches between judgements reported in the literature and speaker judgements are not uncommon. Acceptability judgements obtained in more naturalistic environments may capture a broader range of acceptable constructions than reported in the literature.[10]

CONCLUSIONS
Extensive theoretical research alongside emerging experimental work attempts to account for the phenomenon of the dative alternation in English. This research is, however, inconclusive, and open questions remain concerning how features of the complements, such as animacy and givenness, and variation in meaning between patterns affect the use and availability of each pattern.[2, 3, 7, 10, 16, 19, 20] This study targets the claim that there is a difference in meaning between either the DO and PP patterns or between ditransitive constructions in certain classes of ditransitive verbs. Specifically, this study tests whether the DO pattern entails possession and the PP pattern does not (in line with the Alternative Projection approach) or whether the entailment of possession depends on the overall semantic class of a verb (in line with the Verb Sensitive approach). These two accounts are theoretical in nature; this study uses experimental methodology to test if speaker judgements align with the literature.

The results do not support the Alternative Projection approach but suggest partial support for the Verb Sensitive approach. Denial of possession is not rated consistently significantly worse after the DO construction. Denial of possession is possible after both the DO and PP constructions in the Future Having, Communication, Instrument of Communication, and Motion classes, supporting the Verb Sensitive approach. However, the significantly lower ratings after the PP pattern in the Motion class do not align with the Verb Sensitive approach. Further, denial of possession was in fact, on average, acceptable after both constructions in the Giving class, and neither were the follow-up ratings for the Giving class significantly lower than the other classes. Judgements collected in this study contradicted some judgements reported in the theoretical literature, highlighting the importance of experimental methodology in evaluating theoretical claims.

FUTURE DIRECTIONS
Adjustments to the experimental design of the study could offer greater clarity into the applicability of the Verb Sensitive approach. A reduction in the length of the survey could avoid fatigue on the part of the participants. Further, despite the benefits of collecting separate judgements on the initial ditransitive sentences and the follow-up clauses, the separation of these items is a source of potential confusion to participants. Now that the acceptability of the initial set of ditransitive verbs in both patterns is attested, streamlining the experimental design by combining the initial sentences and follow-up clauses into a single item would more directly target judgements on the denial of possession clauses. Contradictions in judgements on individual ditransitive constructions between this study and the literature underscore the value of quantitative studies. Further, as these deviations on the basis on individual ditransitives remain unaccounted for by either this study or the Alternative Projection and Verb Sensitive approaches, further quantitative studies, with a greater number of experimental items per verb, would be of merit.

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PRESS SUMMARY
English has a large class of verbs, known as ditransitive verbs, that have two complements. Many, though not all of these ditransitive verbs allow for two patterns of expression of their complements (**1**).
(**1a**) The salesperson gave the young farmer the grain mixture.   *Double Object (DO) pattern*
(**1b**) The salesperson gave the grain mixture to the young farmer.   *Prepositional (PP) pattern*
At first glance, these patterns seem to be able to alternate freely. However, two competing theories attest that there is a difference in meaning either based on the pattern or the type of ditransitive verb that is used. Both theories argue that there is meaning of successful transfer of possession for certain ditransitive constructions—that is, that *the young farmer* successfully received the *grain mixture* given by *the salesperson*. While one theory claims that the only DO pattern has this possession meaning, the other posits that this possession meaning stems from verbs of the Giving category (*give, hand, rent,* etc.), and as such, that this meaning extends to both the DO and PP patterns when they occur with these verbs. This study evaluates these two theories through an online survey testing to what degree native speakers interpret a meaning of possession from the DO and PP patterns. The results of this study suggest that this meaning of successful possession is not restricted to the DO pattern and provide partial support for the claim that the availability of the possession meaning depends on the type of ditransitive verb. Further, judgements collected in this study contradicted some judgements reported in the theoretical literature, highlighting the importance of experimental methodology in evaluating theoretical claims.