Relative clause subextraction in English[1][2]

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Contents

1 Introduction

Relative clauses are known as one of the standard strong islands (Ross 1967), but certain languages have been shown to allow movement out of relative clauses in particular syntactic-semantic environments, especially Mainland Scandinavian languages, including Swedish (Allwood 1982; Engdahl 1997; Kush and Lindahl 2011; Lindahl 2015), Danish (Erteschik-Shir 1973; Erteschik-Shir and Lappin 1979), and Norwegian (Taraldsen 1982). Many of these authors observe that extraction from relative clauses is facilitated in existential environments, in which the existence of the DP containing the relative clause is being asserted. According to Allwood (1982), such configurations are so common that traditional Swedish grammarians have given them a name—*satsflätor* 'sentence braid'—and warned against using them in written language. Sichel (2018) also reports that Hebrew tolerates extraction from relative clauses in existential and existential-like environments, and in a squib, Cinque (2010) observes that Italian and other Romance languages appear to tolerate extraction from relative clauses in these environments, as well. Characteristic examples from each of these languages are shown in (1), adapted from the source cited with each example.

(1)   a. SWEDISH
       De   blommorna känner jag en man som säljer.
       those flowers   know I   a   man that sells
       '[Those flowers]$_1$, I know a man that sells t_1.'   (Allwood 1982, p. 24)

   b. DANISH
       Det er der mange der kan lide.
       '[That]$_1$, there are many people who like t_1.'
                           (Erteschik-Shir and Lappin 1979, p. 55)

   c. NORWEGIAN
       Rødsprit$_1$ slipper vi ingen   inn som har drukket t_1.
       red.spirit let   we nobody in   that has drunk
       'Red spirit, we let nobody in that has drunk (it).'   (Taraldsen 1982, p. 206)

   d. HEBREW
       al   lexem šaxor$_2$, ani makira rak   [gvina levana axat]$_1$ še-efšar
       on bread black   I   know   only cheese white   one   that-possible
         limroax t_1 t_2.
         to.spread
       'On black bread, I know only one white cheese that can be spread.'
                            (Sichel 2018, p. 336)

   e. ITALIAN
       . . . +Ida, di cui non c'è nessuno che sia mai stato innamorato,

       'Ida, whom there is nobody that was ever in love with, . . . '
                            (Cinque 2010, p. 83)

Research on extraction from relative clauses (henceforth, RC subextraction) in English is somewhat limited, and much of the research on languages that selectively allow RC subextraction either implicitly or overtly assumes that English is fundamentally different, banning RC subextraction in all environments (although Erteschik-Shir and Lappin 1979, p. 58 notably observe that the English extraction patterns seem to be similar to Danish). There is some reason to treat the assumption that English is different with skepticism, though. First of all, there is some discussion in the published literature on cases of RC subextraction in English that seem unusually acceptable (2).

(2) a. This is the child who there is nobody who is willing to accept.
(Kuno 1976, (1–20a))

b. Then you look at what happens in languages that you know and languages that you have a friend who knows. (McCawley 1981, (15a))

c. This is the one that Bob Wall was the only person who hadn't read.
(McCawley 1981, (15b))

d. That's one trick that I've known a lot of people who've been taken in by.
(Chung and McCloskey 1983, (9a))

e. Isn't that the song that Paul and Stevie were the only ones who wanted to record?
(Chung and McCloskey 1983, (9b))

f. This is a paper that we really need to find someone who understands.
(Chung and McCloskey 1983, (9c))

Second, Kush et al. (2013) present experimental evidence which suggests that the environments in which RC subextraction is acceptable in Swedish also attenuate island effects in English. In particular, they show that when a relative clause appears in the pivot of an existential (3a), in the object position of a verb of perception (3b), or in the object position of the verb 'know' (3c), acceptability ratings significantly increase relative to sentences that are otherwise identical but have the predicate 'meet' (3d). Some of these environments are found in the examples cited in (2).

(3) a. ? That was the bill$_1$ that **there were** many senators who supported t_1 in the congress.

b. ? That was the bill$_1$ that **he saw** many senators who supported t_1 in the congress.

c. ? That was the bill$_1$ that **he knew** many senators who supported t_1 in the congress.

d. * That was the bill$_1$ that **he met** many senators who supported t_1 in the congress.
(adapted from Kush et al. 2013, pp. 260–264)

The main purpose of this paper is to present experimental evidence that island effects are substantially reduced in English when the relative clause is within the pivot of an existential (4a) or a non-verbal predicate nominal (4b), relative to transitive object environments (4c). The research presented here thus extends the findings of Kush et al. (2013) and identifies another environment (predicate nominals) that increases relative clause transparency to extraction—one that is known to increase transparency to extraction at least in Hebrew (Sichel 2018, p. 357).

(4) a. ?[Which article]$_1$ did you say that there is only one journalist who read t_1?

  b. ?[Which article]$_1$ did you say that Michael thinks he's the only journalist who read t_1?

  c. *[Which article]$_1$ did you say that Michael remembered the only journalist who read t_1?

Some of the research on both RC subextraction and extraction from DP generally suggests that the definiteness of the DP out of which extraction occurs is one of the main factors affecting the DP's transparency to extraction, such that indefinite DPs are more transparent, and definite DPs are not (for discussion, see Kush et al. 2013, pp. 245–246, as well as Sichel 2018, pp. 354–361; for an account of DP transparency based on definiteness, see Jiménez Fernández 2009). Based on experimental evidence, this paper argues against DP definiteness as one of the main factors affecting DP transparency. In line with Sichel (2018), it is argued that the apparent correlation between DP transparency and indefiniteness is due to the presuppositionality of the DP referent, which is determined largely by the syntactic-semantic environment of that DP. Whether or not a DP referent is presupposed is loosely related to the definiteness of the determiner used, but the notions are independent, such that an indefinite DP that is presupposed is not transparent to extraction, and a definite DP that is non-presupposed *is* transparent to extraction.

A secondary purpose of this paper is to evaluate two experimental designs intended to measure island effects and discuss methodological challenges associated with them. Two of the three experiments discussed in the present paper employ a factorial design based on Sprouse et al. (2012)[1] that allows the impacts of island-violating extraction to be isolated from two other potentially confounding factors: the length of the extraction, and the complexity of clauses typically considered to be islands (hence the "length by complexity" name sometimes given to this design). Since the design allows the costs for each of these factors to be calculated, the strength of an island can be isolated, potentially allowing for comparison across syntactic environments, across different island types, and across languages. An alternative design is deployed in the second experiment which compares long-distance extraction to a long-distance anaphoric dependency. It is argued here that the length by complexity design is more successful for estimating island effects, but that care needs to be taken when attempting to compare island effects in different syntactic environments.

The paper is organized as follows. §2 provides a background summary of the literature on acceptable cases of relative clause subextraction in other languages, focusing on the factors that affect transparency to extraction. §3 outlines the logic of the length by complexity design, and in §3.1, Experiment 1 is used to illustrate how the design can be extended to compare islands in different environments. Experiment 1 investigates whether the transparency of RCs within object DPs of transitive verbs is affected by the object DP's definiteness. The results suggest that definiteness alone has no impact on the acceptability of RC subextraction, and it is discussed how the length by complexity design makes it possible to determine this. §4 describes Experiment 2, which tested RC

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1. This design has also been used in other work, including at least Keshev and Meltzer-Asscher (2018) and Sprouse et al. (2013b, 2011, 2016).

transparency to subextraction in existential environments using a different experimental design. The results of this experiment suggest that English RCs are more transparent to extraction in existential clauses. Potential confounds in the materials and issues with the design are discussed. §5 presents Experiment 3, which moves back to the length by complexity design and finds that both existential and predicate nominal environments increase RC transparency to extraction relative to transitive object environments. §6 provides an overall discussion of the findings and how they should be explained, and §7 concludes. Supplemental materials can be found in the appendices.

2 Background: Extraction from RCs in other languages

2.1 Danish

Erteschik-Shir and Lappin (1979, p. 55) write that in Danish, RC subextraction is impossible in most environments (much like English). Although they put the criteria for acceptable RC subextraction in terms of their pragmatic notion of dominance,[2] they note several lexical and structural factors that are typically compatible with their pragmatic criteria. First, RC subextraction is usually possible if the matrix clause is an existential clause (5).

(5) Det er der mange der kan lide.
     That there are many who like.
     (There are many who like *that*.) (Erteschik-Shir and Lappin 1979, p. 55)

Extraction is also possible, they write, when the matrix clause can be construed as serving to "[introduce] into the sentence the head of the relative clause," such as when the matrix predicate is 'know' (6a) or 'meet' (6b). A first person matrix subject is apparently critical for this function (1979, p. 57). It is implied here that these predicates have somewhat of an existential "flavor" (see §2.4 for some discussion of the role of so-called non-canonical existentials).

(6) a. Det kender jeg mange der kan lide.
         That know I many who like.
         (I know many who like *that*.) (1979, p. 55)

     b. Det har jeg mødt mange der har gjort.
         That have I met many who have done.
         (I have met many who have done *that*.) (1979, p. 55)

The more complex the matrix clause is (mainly affected by the matrix predicate, but also the definiteness of the head NP of the RC), they write, "the more difficult it is to interpret this matrix in a manner analogous to the existential operator." Thus, examples like those

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2. They define dominance as a property belonging to a constituent whose intension the speaker intends to direct the hearer's attention to. This notion works together with their Dominance Hypothesis, which states that RC subextraction is possible iff the clause containing the NP that hosts the relative clause is dominant (or if the NP that hosts the relative clause is itself dominant).

in (7) have diminished acceptability. (7a-7b) have different, more "semantically complex" matrix predicates, and (7c)'s stressed matrix predicate (emphasis in example is mine) reportedly affects the acceptability of subextraction (Erteschik-Shir and Lappin 1979, p. 57).

(7) a. *Det$_i$ har   jeg spurgt mange der   har   gjort t_i.
         that have I   asked many who have done
         ('I have asked many who have done *that*.')   (1979, p. 55)

     b. *Det$_i$ har   jeg drillet   mange der   har   gjort t_i.
         that have I   made.fun.of many that have done
         ('I have made fun of many that have done *that*.')   (1979, p. 55)

     c. *[Det hus]$_i$ *kender* jeg en mand som har købt t_i.
          that house know I   a   man   who has bought
         ('I *know* a man who has bought that house.')   (1979, p. 55)

In summary, RC subextraction in Danish is most acceptable in existential clauses and with certain verbs like *know* or *meet*. More semantically complex predicates lower the possibility for RC subextraction.

2.2 Swedish

Another Scandinavian language, Swedish, has also been argued to allow extraction from RCs. Engdahl (1997) argues that typical RC subextractions in Swedish involve "presentational constructions," which introduce a new referent. This type of sentence is often formed as an existential sentence with the expletive nominal *det* 'it' (8), or *där/der* 'there' in certain dialects. There are also a number of cleft constructions that Engdahl assumes contain relative clauses, and these also often tolerate subextraction.

(8) Det språket$_j$ finns det många som talar t_j
     that language exist it   many   that speak
     'That language, there are many who speak (it).'   (Engdahl 1997, p. 13)

While RC subextractions in Swedish often occur when the main predicate is the existential operator, Engdahl (1997) reports that RC subextractions also can occur when the relative clause is situated in an NP object of a verb like *känner* 'know' (9a), *behöva* 'need' (9b), *känna till* 'know of', *se* 'see' (9c), *hitta på* 'make up', and *beundra* 'admire', perhaps related to the predicates noted by Erteschik-Shir and Lappin (1979) and mentioned in §2.1. Engdahl suggests that what is important is that what follows the fronted constituent must be able to be construed as a relevant comment (or predicate) of that constituent.

(9) a. [Den teorin]$_k$ känner jag ingen$_j$ som tror på t_k
that theory know I nobody that believes in
'That theory, I know nobody that believes in (it).' (1997, p. 24)

b. Det$_j$ bohöver vi någon som tar hand om t_j
that need we someone who takes care of
'That, we need someone who takes care of (it).' (1997, p. 24)

c. [En sådan frisyr]$_j$ har jag aldrig sett någon som ser snygg ut i t_j.
that such hairstyle have I never seen anyone who looks good in
'That kind of hairstyle, I have never seen anyone who looks good in (it).'
(1997, p. 24)

Engdahl notes that "one sometimes comes across the claim that extractions out of relative clauses are only possible if the head NP is indefinite," but argues that the correlation between RC subextraction and an indefinite RC head is a consequence of the types of sentences that allow RC subextraction, rather than a consequence of the definiteness of the head NP. For instance, existential sentences exhibit a definiteness effect (10), but cleft constructions allow RC subextractions whether the head NP is definite (11a) or indefinite (11b).

(10) EXISTENTIAL

a. [Det språket]$_i$ finns det många som talar t_i
that language exist it many that speak
'That language, there are many that speak (it).' (1997, p. 25)

b. *[Det språket]$_j$ finns det kvinnan som talar t_j
that language exist it the.woman that speaks
('That language, there is the woman that speaks (it).') (1997, p. 25)

(11) CLEFT

a. Detta$_j$ är det bara presidenten som kan avgöra t_j.
this it only the.president who can decide
'This, it's only the president who can decide (it).' (1997, p. 26)

b. Lax$_j$ var det många som ville ha t_j.
salmon was it many who wanted
'Salmon, it was many who wanted (it).' (1997, p. 27)

Engdahl observes that in some cases where the definiteness of the head NP appears to affect the acceptability of RC subextraction, the effect is really due to the compatibility of the head NP with the main predicate inside the RC—particularly, a property she refers to as its distributivity. For example, a definite head NP of a subject relative will be most compatible with a predicate that typically denotes a unique-individual-to-one relation,

and an indefinite head NP will be most compatible with a predicate that typically denotes a many-to-one relation. Believing, for example, is typically a many-to-one relation, and when this is the RC predicate, the most natural head NP is one that does not entail a unique believer (12). This effect holds even when RC subextraction does not occur (13), showing that the effect is independent of RC subextraction. On the other hand, inventing is typically a one-to-one relation, and when *invent* is the RC predicate, the most natural head NP entails uniqueness (14).

(12) a. [Den teorin]$_k$ känner jag ingen   som tror   på t_k.
          that theory know I   nobody that believes in
          'That theory, I know nobody that believes in (it).'

    b. ??[Den teorin]$_k$ känner jag mannen som tror   på t_k.
            that theory know I   the.man that believes in
            ('That theory, I know the man that believes in (it).')   (1997, p. 27)

(13) ??Jag känner mannen som tror   på den här   teorin.
     I   know   the.man that believes in this here theory
    ('I know the man who believes in this theory.')   (1997, p. 27)

(14) a. [Den här teorin]$_j$ känner jag mannen som uppfann t_j.
          this here theory know   I   the.man that invented
          'This theory, I know the man who invented (it).'

    b. ??[Den här teorin]$_j$ känner jag ingen   som uppfann t_j.
           this here theory know   I   nobody that invented
           ('This theory, I know nobody who invented (it).')   (1997, p. 28)

In summary, Swedish also appears to allow RC subextraction in existential clauses and clauses with predicates that serve to introduce or present a DP referent into the discourse. This latter type of predicate is presumably related to the predicates that Erteschik-Shir and Lappin (1979) observe to be compatible with RC subextraction (*know* and *meet*).

2.3   Norwegian

Norwegian is also claimed to allow RC subextraction (Taraldsen 1982). Like the previous authors, Taraldsen notes that there are only certain environments in which RC subextraction is possible in Norwegian, but focuses on the apparent need for an RC out of which subextraction has occurred to be extraposed, noting the contrast in (15–16).

(15) a. *Her er en bok$_i$ som ingen   som har lest t_i, kommer til himmelen.
          here is a   book that nobody   that has read   comes   to heaven
          ('Here is a book that nobody that has read (it) comes to heaven.')

    b.   Her er en bok$_i$ som ingen   kommer til himmelen som har lest t_i.
          here is a   book that nobody comes   to heaven   that has read
          'Here is a book that nobody that has read (it) comes to heaven.'   (1982, p. 206)

(16)   a.   *Rødsprit$_i$ slipper vi ingen   som har drukket t_i, inn.
          red.spirit let   we nobody that has drunk   in
          ('Red Spirit, we let nobody in that has drunk (it).')

      b.   Rødsprit$_i$ slipper vi ingen   inn som har drukket t_i.
          red.spirit let   we nobody in   that has drunk
          'Red spirit, we let nobody in that has drunk (it).'   (1982, p. 206)

Taraldsen argues that examples such as (15b) and (16b) are acceptable because of an ordering of operations. Once extraposition of the relative clause has taken place, constituents within the relative clause can be acceptably extracted because they no longer have to cross the NP bounding node within which the relative clause was generated.

    The other pattern Taraldsen observes is that when RC subextraction takes place out of a relative clause base-generated in subject position, the result is unacceptable even when the relative clause is extraposed (17a). When there is no RC subextraction, the sentence is acceptable (17b).

(17)   a.   *[Hans kone]$_i$ besøker ingen   Jens som kjenner t_i
          his wife   visits   nobody Jens that knows
          ('His wife, nobody that knows (her) visits Jens.')   (1982, p. 208)

      b.   Ingen   besøker Jens som kjenner hans kone.
          nobody visits   Jens that knows his   wife
          'Nobody that knows his$_i$ wife visits Jens$_i$.'   (1982, p. 208)

The apparent ban on subextractions from RCs generated in subjects may be related to so-called freezing effects, which occur when extraction takes place out of a consistuent that has already moved as a whole.

    Regarding Taraldsen's observations about relative clauses out of which something has been extracted needing to be extraposed, Engdahl (1997, p. 7) writes that his observations capture "what seems to be a characteristic property of relative clause extractions, namely the fact that the relative clause tends to be clause-final."

    Although Taraldsen focuses on an apparent need for the RC out of which subextraction occurs to be clause-final, it is worth noting that many of his examples illustrating RC subextraction exhibit properties related to those discussed for Danish and Swedish. For instance, one example involves extraction from an RC in the object of the verb *møtt* 'meet', and the examples above involve RC subextraction out of a DP that is inherently non-presupposed, *ingen* 'nobody'.

2.4 Hebrew

Regarding RC subextraction in Hebrew, Sichel (2018) observes several factors that influence transparency to extraction, some of which have not been discussed for the Scandinavian languages. First, the relative clause must be situated in a non-presuppositional DP—i.e. a DP whose referent's existence is not presupposed, but is asserted. This condition is met in a number of different types of sentences, including canonical existentials (18) (as observed for Danish in Erteschik-Shir and Lappin (1979), Swedish in Engdahl (1997), and English in Kush et al. (2013)).

(18)   EXISTENTIAL

   a.   al   lexem šaxor, yeš rak   gvina axat še-keday   limroax.
        on bread black BE only cheese one that-worth to.spread
        'On black bread, there is only one cheese that's worth spreading.
                                                        (Sichel 2018, p. 357)

   b.   me-ha-sifria   ha-zot$_2$, yeš ulay   [xamiša sfarim$_1$ [še-keday   PRO
        from-the-library the-this BE maybe   five   books   that-worth
           lehaš'il t_1 t_2.
           to.borrow
        'From this library, there are hardly five books worth borrowing.'
                                                               (2018, p. 357)

In addition to canonical existentials, sentences with nonverbal predicates in which the predicate is the DP containing the relative clause also tolerate RC subextraction (19).

(19)   NON-VERBAL PREDICATE

   a.   al   ha-haxlata   ha-zot$_2$, yair lapid haya [ha-axaron še-yada t_2].
        about the-decision the-this Yair Lapid was   the-last   that-knew
        'About this decision, Yair Lapid was the last to know.'   (2018, p. 358)

   b.   et   ha-toxnit   ha-zot$_2$, ata [ha-yaxid še-ro'e t_2
        ACC the-program the-this you the-single that-watches
        'This program, you're the only one who watches.'   (2018, p. 358)

Finally, non-canonical existential sentences in which the DP referent's existence is asserted or implied (20a-20b), or denied (20c) are compatible with RC subextraction. (20a) is repeated from (1d). Also important for the DP to be interpreted non-presuppositionally in non-canonical existentials is for the matrix subject to be first person, a factor that was also observed by Erteschik-Shir and Lappin (1979) and noted in §2.1.

(20) Non-canonical existential

    a. al   lexem šaxor$_2$, ani makira rak   [gvina levana axat]$_1$ še-efšar
        on   bread black I   know   only cheese white   one   that-possible
        limroax t_1 t_2.
        to.spread
        'On black bread, I know only one white cheese that can be spread.'

    b. miškafayim yerukot ka-ele, ra'iti kan etmol   mišehu   še-moxer.
        eyeglasses green   like-that saw.I here yesterday someone that-sells
        'That kind of green eyeglasses, I saw here yesterday someone who sells.'

    c. me-ha-sifria   ha-zot$_2$, od lo   macati [sefer exad$_1$ [še-keday   PRO
        from-the-library the-this yet not found.I book one   that-worth
        lehaš'il t_1 t_2]].
        to.borrow
        'From this library, I haven't yet found a single book that's worth borrowing.'
        (2018, p. 358)

Separate from the presuppositionality of the DP containing the relative clause, Sichel also argues extensively that any relative clause out of which a constituent is acceptably extracted must be a raising relative clause (in the sense of Kayne 1994; Vergnaud 1974, among others). When other factors force a matching relative clause analysis, such as when reconstruction of the relative clause head would give rise to a Principle C violation, (Bhatt 2002; Hulsey and Sauerland 2006) RC subextraction is not acceptable (21a). When the raising analysis would not give rise to a Principle C violation, RC subextraction is acceptable (21b).

(21) a. *me-ha-doda   ha-zot$_3$, yeš [kama tmunot bar micva   šel dani$_1$]$_2$ še-hu$_1$
        from-the-aunt the-this BE few   photos bar mitzvah of Dani   that-he
        ša'al t_2 t_3.
        borrowed
        'From this aunt, there are a few bar mitzvah pictures of Dani that his mother borrowed.'

    b. me-ha-doda   ha-zot$_3$, yeš [kama tmunot bar micva   šel dani$_1$]$_2$
        from-the-aunt the-this BE few   photos bar mitzvah of Dani
        še-ima   šelo$_1$ ša'ala t_2 t_3.
        that-mother his   borrowed
        'From this aunt, there are a few bar mitzvah pictures of Dani that his mother borrowed.'   (2018, p. 343)

Although Hebrew belongs to an entirely different language family than the Scandinavian languages, the factors affecting the acceptability of RC subextraction are remarkably similar. Much like Danish and Swedish, the language's canonical existential construction facilitates subextraction. Non-canonical existential clauses work just as well, and these

involve predicates like *know*, *see*, and *find*, which are often used to implicitly assert or deny the existence of their complement. This class of predicates is likely the same class of predicates noted by Erteschik-Shir and Lappin (1979) and Engdahl (1997) to improve RC subextraction.

2.5   Italian (and Romance)

Cinque (2010) presents the following examples of RC subextraction in Italian. (22a) is similar to the non-canonical existentials discussed in §2.4, having a first person matrix subject and a non-presuppositional DP which contains the relative clause. (22b-22c) have existential matrix clauses that deny the existence of the referent of the DP containing the relative clause.

(22) a.   Giorgio, al quale non conosco nessune che sarebbe disposto ad affidare i
              propri risparmi, …
           'Giorgio, whom I don't know anybody that would be ready to entrust with their
           savings, …

      b.   Ida, di cui non c'è nessuno che sia mai stato innamorato, …
           'Ida, whom there is nobody that was ever in love with, …'

      c.   Gianni, al quale non c'è nessuno che sia in grado di resistere, …
           'Gianni, whom there is nobody that is able to resist, …'   (2010, p. 83)

Cinque also presents examples from French (23) and Spanish (24), both of which involve RC subextraction from DPs in existential clauses.

(23) FRENCH

      a.   Jean, à qui il n'y a personne qui puisse s'opposer, …
           'Jean, whom there is nobody that could oppose, …'

      b.   (?)C'est un endroit où il n'y a personne qui voidrait vivre.
           It's a place where there is no one that would like to live.   (2010, p. 84)

(24) SPANISH

      a.   Ida, de quien no hay nadie que se haya enamorado alguna vez, …
           'Ida, whom there is nobody that was ever in love with, …'

      b.   Ese es un sitio en el que no hay nadie que querría vivir.
           'This is a place where there is no one that would like to live.'   (2010, p. 84)

2.6   Interim summary

The following table summarizes observations about the factors that affect the acceptability of RC subextraction, both those made by the authors cited in this section and those made by the current author about the examples given by those authors.

Table 1: Properties argued to affect RC transparency to extraction

Language	Syntactic-semantic property			
	Existential	Predicates like *know*	Extraposed RC req'd	Raising RC req'd
Danish	✓	✓	?	?
Swedish	✓	✓	?	?
Norwegian	✓	✓	✓	?
Hebrew	✓	✓	✗	✓
Romance	✓	✓(?)	?	?

3 Sifting for island effects experimentally

The length by complexity design (Sprouse et al. 2012, and others) is a factorial experimental design intended to allow the researcher to isolate island violation effects from the potentially confounding factors of extraction distance and the additional complexity associated with typical islands. Extraction distance is independently known to affect sentence processing, such that grammatical longer-distance extractions are more difficult to process than grammatical shorter-distance extractions. Typical islands such as relative clauses or embedded WH-questions are also more difficult to process (relative to embedded *that*-clause complements), and this is typically ascribed to the A-bar dependency involved in their formation. Both of these processing challenges have been shown to impact the ratings that experiment participants give to these sentences.

At its simplest, the length by complexity design requires two factors with two levels each. The first factor is extraction length, comparing extraction of a matrix subject (a SHORT extraction) to extraction of an argument in an embedded clause—here, an embedded object (a LONG extraction). The SHORT level is taken as the baseline, on the assumption that short extractions are easiest to process. The second factor is the structure of the embedded clause, in which embedded *that*-clauses (NON-ISLAND) are compared to an embedded clause considered to be an island (ISLAND). For Experiment 1, this is a Complex DP containing either a RC or a CP complement to N. The NON-ISLAND level is taken to be the baseline here, on the assumption that embedded *that*-clauses are easier to process than embedded clauses typically considered to be islands.

Crossing these two factors results in an experiment with four conditions, laid out in Table 2. An abstract template for each of these conditions is shown in (25).

(25) a. DP_i [$_{TP}$ __$_i$ ...... [$_{CP}$ *that* ....]]   NON-ISLAND | SHORT

    b. DP_i [$_{TP}$ .... [$_{CP}$ *that* ...... __$_i$]]   NON-ISLAND | LONG

    c. DP_i [$_{TP}$ __$_i$ ...... [$_{ISLAND}$ ....]]   ISLAND | SHORT

    d. *DP_i [$_{TP}$ .... [$_{ISLAND}$ ...... __$_i$]]   ISLAND | LONG

14

Table 2: Conditions in a minimal length by complexity experiment

STRUCTURE	LENGTH	
	SHORT	LONG
NON-ISLAND	NON-ISLAND $\mid$ SHORT	NON-ISLAND $\mid$ LONG
ISLAND	ISLAND $\mid$ SHORT	ISLAND $\mid$ LONG

Taking NON-ISLAND to be the baseline level in the STRUCTURE factor and SHORT to be the baseline level in the LENGTH factor, the condition combining these two levels will be the baseline condition against which all the others are measured. The baseline condition is assumed to involve some processing cost, β, that will be reflected in the acceptability ratings given to sentences in this condition. The remaining conditions are assumed to involve the same processing cost of the first condition plus some other cost. Imagine this cost as a penalty to the ratings given to that condition. The NON-ISLAND $\mid$ LONG condition is assumed to have a penalty resulting from the length of extraction, and the ISLAND $\mid$ SHORT condition is assumed to have a penalty due to the added complexity of the island. Finally, the ISLAND $\mid$ LONG condition is assumed to have both the length and complexity penalties, as well as an island violation penalty. The penalties associated with each condition are summarized in (26).

(26) a. NON-ISLAND $\mid$ SHORT $= \beta$

  b. NON-ISLAND $\mid$ LONG $= \beta +$ LENGTH

  c. ISLAND $\mid$ SHORT $= \beta +$ COMPLEXITY

  d. ISLAND $\mid$ LONG $= \beta +$ LENGTH + COMPLEXITY + ISLAND VIOLATION

With these assumptions in place, isolating the island violation penalty can be achieved arithmetically, since in an acceptability judgment experiment, each condition receives a numerical rating. First, we can take the average rating for the ISLAND $\mid$ LONG condition and remove the baseline penalty and the length penalty by subtracting that rating from the average rating for the NON-ISLAND $\mid$ LONG condition, as illustrated in (27). Following previous work, this difference is called D1. Note that since all of these factors are penalties, their values will actually be negative. However, the difference scores are calculated in such a way that the penalty is represented by a positive number.

(27) $\quad \beta +$ LENGTH $\qquad\qquad\qquad\qquad\qquad\qquad$ (NON-ISLAND $\mid$ LONG)
  $-\quad \beta +$ LENGTH + COMPLEXITY + ISLAND VIOLATION $\qquad$ (ISLAND $\mid$ LONG)
  $=\quad -$ (COMPLEXITY + ISLAND VIOLATION) $\qquad\qquad\qquad\qquad$ (D1)

Next, the complexity penalty needs to be isolated so that it can be removed from the difference in (27). This penalty can be calculated by finding the difference between the NON-ISLAND $\mid$ SHORT condition and the ISLAND $\mid$ SHORT condition, as illustrated in (28). This difference is called D2.

(28)

$$
\begin{array}{lll}
 & \beta & (\text{NON-ISLAND} \mid \text{SHORT}) \\
- & \beta + \text{COMPLEXITY} & (\text{ISLAND} \mid \text{SHORT}) \\
\hline
= & -\text{COMPLEXITY} & (\text{D2})
\end{array}
$$

After calculating differences D1 and D2, a final subtraction yields a differences-in-differences (DD) score, which isolates the island violation penalty (29). In other work utilizing the length by complexity design, a DD score greater than zero is known as a *super-additive* island effect, since the ratings penalty caused by extracting from an island is not a simple sum of the length and complexity penalties.

(29)

$$
\begin{array}{lll}
 & -(\text{COMPLEXITY} + \text{ISLAND VIOLATION}) & (\text{D1}) \\
- & -\text{COMPLEXITY} & (\text{D2}) \\
\hline
= & -\text{ISLAND VIOLATION} & (\text{DD})
\end{array}
$$

With the logic of the length by complexity design now in place, we will consider a mock experiment that compares embedded *that*-clauses to subject RCs with the relative pronoun *who* and compares a short matrix subject extraction to a long embedded object extraction. This mock experiment will have conditions with the structures in (30). Since (30d) involves movement out of a RC, which typically results in a severely degraded sentence, it is expected to be receive the lowest ratings.

(30) a. DP$_i$ [$_{\text{TP}}$ __$_i$ …… [$_{\text{CP}}$ *that* ………]] NON-ISLAND | SHORT

  b. DP$_i$ [$_{\text{TP}}$ ……… [$_{\text{CP}}$ *that* …… __$_i$]] NON-ISLAND | LONG

  c. DP$_i$ [$_{\text{TP}}$ __$_i$ …… [$_{\text{RC}}$ *who* ………]] ISLAND | SHORT

  d. DP$_i$ [$_{\text{TP}}$ ……… [$_{\text{RC}}$ *who* …… __$_i$]] ISLAND | LONG

To minimize confounding factors, the stimuli within each item should be made as similar as possible, including lexical material, number of words, etc. For an experiment comparing embedded *that*-clauses to relative clauses, one way to minimize differences across the NON-ISLAND and ISLAND conditions is to only use matrix verbs that can take either a *that*-clause complement or a DP complement, such as *understand*, *notice*, or *believe*. The following is a sample item that meets these criteria and uses WH-movement for extraction.

(31) SAMPLE ITEM FOR A MOCK LENGTH BY COMPLEXITY EXPERIMENT

  a. Who _ understands that the teachers dislike unstapled papers? NON-ISLAND | SHORT

  b. What does Lorena understand that the teachers dislike _? NON-ISLAND | LONG

  c. Who _ understands the teachers who dislike unstapled papers? ISLAND | SHORT

  d. What does Lorena understand the teachers who dislike _? ISLAND | LONG

Let us assume that an acceptability judgment experiment is run with items modeled on (31), using a ratings scale of 1-6, 1 being "clearly bad" and 6 being "clearly good". Imagine that the conditions received the average ratings presented in Table 3, which are also

Table 3: Mock results for a simple length by complexity experiment

STRUCTURE	LENGTH	
	SHORT	LONG
NON-ISLAND	5.0	3.9
ISLAND	4.7	1.9

represented graphically in Figure 1. Note that the highest-rated condition is the NON-ISLAND | SHORT condition, and that the ISLAND | LONG condition is rated lowest. This is expected for a condition representing extraction from an island.

Using these average ratings, we can calculate an island score for English RCs as illustrated above. First, following (27), D1 is calculated as in (32), which gives us the combined cost of COMPLEXITY and ISLAND VIOLATION. Next, following (28), D2 is calculated as in (33), giving us the isolated COMPLEXITY cost. Finally, D2 is subtracted from D1, resulting in the DD score (34), which represents the island score—the strength of the island used in the experiment. Due to the direction in which the subtractions are done, the resulting island score is a positive number. The higher the island score is, the stronger the island is considered to be, and the more degraded subextraction is predicted to be. For the remainder of the paper, the DD score calculation will be represented in a DD table, as shown in Table 4.

(32) COMPLEXITY + ISLAND VIOLATION PENALTY

$$
\begin{array}{rll}
 & 3.9 & \text{(NON-ISLAND | LONG)} \\
- & 1.9 & \text{(ISLAND | LONG)} \\
\hline
= & 2.0 & \text{(D1)}
\end{array}
$$

(33) COMPLEXITY PENALTY

$$
\begin{array}{rll}
 & 5.0 & \text{(NON-ISLAND | SHORT)} \\
- & 4.7 & \text{(ISLAND | SHORT)} \\
\hline
= & 0.3 & \text{(D2)}
\end{array}
$$

(34) ISLAND VIOLATION PENALTY

$$
\begin{array}{rll}
 & 2.0 & \text{(D1)} \\
- & 0.3 & \text{(D2)} \\
\hline
= & 1.7 & \text{(DD)}
\end{array}
$$

The island score for the RC island used in this experiment is 1.7. Since the above calculation is done on the averages of the raw ratings given by the mock participants, the DD score represents the average ratings penalty caused by RC subextraction in this specific experiment (with this experiment's items). In papers based on actual length by complexity experiments, the ratings are *z*-scored before these calculations are made, which allows for a more accurate comparison across participants, syntactic-semantic environments, and experiments. From here on, average ratings will be shown in plots like the one in Figure 1, but DD scores will be calculated using *z*-scored ratings.

Now that it is clear how a simple length by complexity experiment can be used to gain insight into the strength of an island, Experiment 1 is presented, which extends the
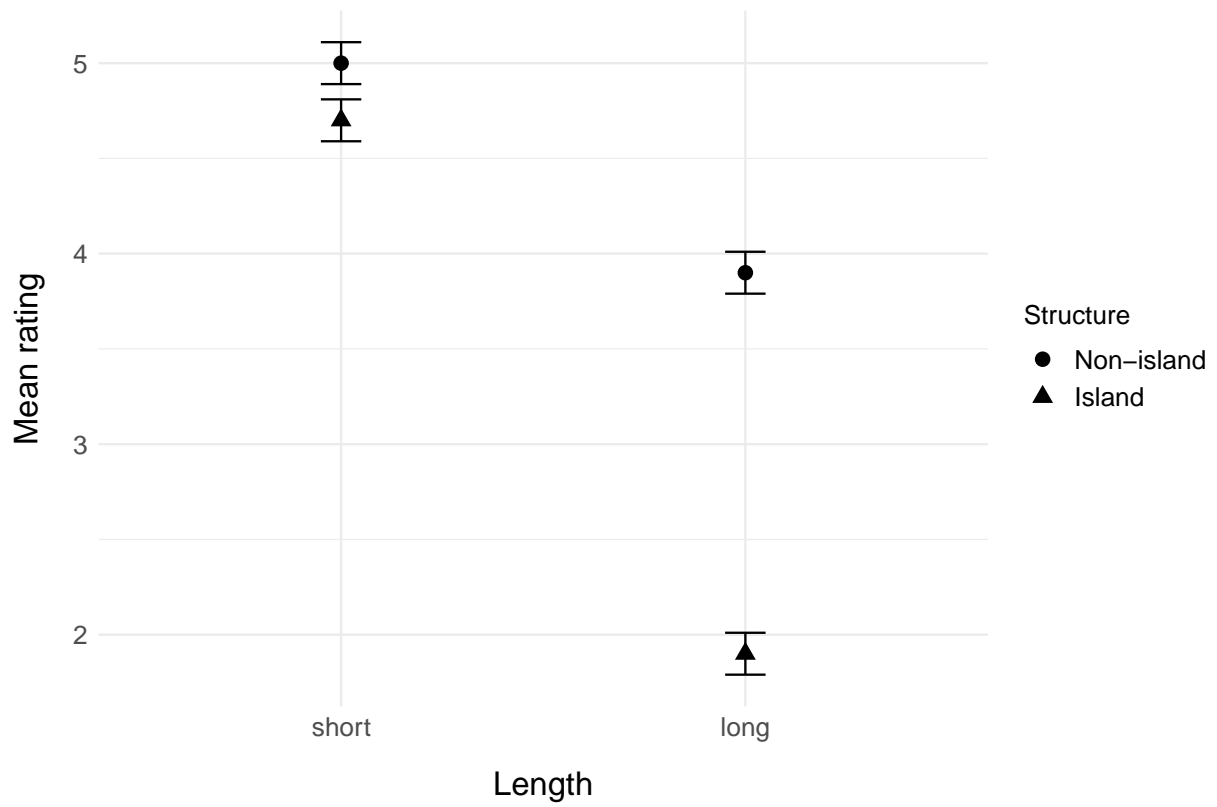
Figure 1: Mock results for a simple length by complexity experiment, arranged by LENGTH

Table 4: Mock DD scores for a simple length by complexity experiment

NON-ISLAND|SHORT	NON-ISLAND|LONG	ISLAND|SHORT	ISLAND|LONG	D1 (COMPLEXITY + ISLAND VIOL.)	D2 (COMPLEXITY)	DD (ISLAND VIOL.)
5.0	3.9	4.7	1.9	2.0	0.3	1.7

simple design by adding an additional factor relating to the definiteness of the DP containing the RC. It was mentioned in the introduction that some work has characterized the definiteness of the containing DP as being one of the factors affecting the acceptability of RC subextraction (and extraction from DPs generally), so it is worth testing the claim experimentally, both to gauge the validity of the claim for English and to show how the length by complexity design can be used to compare island strength in different syntactic-semantic environments.[3]

3.1 Experiment 1

The goal of Experiment 1 is to investigate whether the definiteness of a DP containing either a relative clause or a CP complement to N has a detectable impact on the acceptability of subextraction. Experiment 1 builds on the design of the mock experiment discussed above.

3.1.1 Participants

32 individuals participated in Experiment 1, 14 of which were family members of the author and 18 of which were UC Santa Cruz undergraduates who received course credit for their participation. One participant did not complete the experiment due to time constraints, but that participant's data is included in the analysis.

3.1.2 Materials & methods

Experiment 1 extends the length by complexity design discussed above by adding an additional factor, resulting in a 2×2×2 factorial design. The third factor relates to the definiteness of the DP that hosts the RC or CP complement to N. This factor is named DEFINITENESS, and its levels are DEF(INITE) and IND(EFINITE). In the ISLAND conditions, this factor pertained to the DP that contains the RC/CP complement; however, since the NON-ISLAND conditions use an embedded *that*-clause complement of a verb, the embedded clause is not embedded inside a DP, and an analogous DP had to be chosen on which to reflect the DEFINITENESS factor. Since the DP hosting the RC in the ISLAND conditions contained a subject RC, in the NON-ISLAND conditions this DP's lexical material was recycled as the subject of the embedded clause. It was this DP whose definiteness was manipulated in the NON-ISLAND conditions. This difference across the ISLAND and NON-ISLAND conditions is best seen by studying the DP *the teachers* in (35a) and (35e)

This combination of factors gives a total of eight conditions per item. 32 items were created. Half of these items had a RC as the island, and the other half had a CP complement to N as the island. The DEFINITE conditions all used the article *the*. 24 of the items' INDEFINITE conditions used the indefinite article *a(n)*, and the remaining eight items used bare plurals. This was done selectively when using the indefinite article didn't sound

---

3. See, for instance, Erteschik-Shir and Lappin (1979, pp. 55–56) regarding extraction from complex DPs (containing clauses), and Diesing (1992, pp. 127–136) regarding extraction from simple DPs (containing PPs, for instance).

natural, and it was assumed that this change would have no effect on processing. Henceforth, the items that used CP complements to N instead of RCs are ignored because the choice between these two clause types didn't have a significant impact on the acceptability of subextraction. The interested reader can find a description of the CP complement conditions in Appendix C.

A sample item is presented below, representing the items with relative clauses as the island (35). As in the mock experiment above, matrix verbs were chosen that are compatible with either a CP or a DP complement. In the NON-ISLAND conditions, the verbs had a CP complement, and in the ISLAND conditions, the verbs had a DP complement.

(35) EXPERIMENT 1 SAMPLE ITEM

    a. Who understands that the teachers dislike unstapled papers?NON-ISLAND|SHORT|DEF

    b. Who understands that teachers dislike unstapled papers?   NON-ISLAND|SHORT|IND

    c. What does Lorena understand that the teachers dislike?   NON-ISLAND|LONG|DEF

    d. What does Lorena understand that teachers dislike?   NON-ISLAND|LONG|IND

    e. Who understands the teachers who dislike unstapled papers?   ISLAND|SHORT|DEF

    f. Who understands teachers who dislike unstapled papers?   ISLAND|SHORT|IND

    g. What does Lorena understand the teachers who dislike?   ISLAND|LONG|DEF

    h. What does Lorena understand teachers who dislike?   ISLAND|LONG|IND

The experimental conditions were distributed among eight lists using a Latin Square so that four observations per condition were obtained per participant, and no more than one condition per item was seen by any participant. Each participant saw a total of 32 experimental sentences. These were randomly sorted with 64 filler sentences, for a total of 96 sentences. The filler sentences were adapted from Sprouse et al. (2013a), a study based on a random sample of example sentences from Linguistic Inquiry articles from 2001–2010. Modifications were made to 18 of these sentences so that the average length of the filler sentences (10.6 words) was not substantially greater than the average length of the experimental sentences (10.0 words). Fillers were selected so that each participant saw an equal number of declarative and interrogative sentences in the course of the experiment (48 of each), and a reasonable balance of expected grammatical and expected ungrammatical sentences (70% grammatical, 30% ungrammatical)

This experiment was deployed as a pen-and-paper survey. Participants were instructed to rate each sentence by circling a number on a 1 to 6 Likert scale, where 1 is described as "clearly bad", 2 is "pretty bad", 3 is "somewhat bad", 4 is "somewhat good", 5 is "pretty good", and 6 is "clearly good". The survey formed from List 1 is given in Appendix E. The 14 family member participants were instructed to complete the survey individually, but the environment was unable to be controlled for noise and background talking. The 18 undergraduate participants completed the survey in the psycholinguistics lab at UC Santa Cruz.

3.1.3 Analysis

A mixed effects ordinal regression model was fit to the data with a maximal random effects structure. The model coefficients for Experiment 1 are provided with commentary in Appendix B.1.

3.1.4 Predictions

We expect to see a some degree of degradation for longer movement dependencies relative to shorter ones, which would show up as a main effect of LENGTH, as well as a general degradation for ISLAND conditions relative to NON-ISLAND conditions due to the complexity of a RC as compared to an embedded *that*-clause. Statistically, this would surface as a main effect of STRUCTURE.

We also predict there to be a significant degradation for ISLAND | LONG conditions, since these involve extraction out of an island. A general island effect would show up as an interaction between STRUCTURE and LENGTH.

Finally, on the hypothesis that relative clauses in INDEFINITE DPs are more transparent than those in DEFINITE DPs, we would expect to see a three-way interaction between STRUCTURE, LENGTH, and DEFINITENESS.

3.1.5 Results

As predicted, general ratings decreases were found for conditions with long extractions, as well as for conditions with islands. The ISLAND | LONG conditions were rated lowest of all, which is unsurprising given that this condition involves extraction from an island. The INDEFINITE conditions as a whole were rated slightly lower than the DEFINITE conditions. This is visualized in Figure 3.1.5.

In the statistical analysis, there were main effects of LENGTH ($p < 0.001$) and STRUCTURE ($p < 0.001$). The overall penalty of the INDEFINITE conditions also surfaced as a main effect of DEFINITENESS ($p < 0.001$). The interaction of STRUCTURE and LENGTH was significant ($p < 0.001$), which is the predicted island effect. The hypothesis that indefinite DPs will be more transparent to extraction predicts a significant interaction between STRUCTURE, LENGTH, and DEFINITENESS, but this interaction was found not to be significant ($p = .866$).

The averaged *z*-scores for each condition are shown in Table 5. The DD scores are printed in that table for each level of DEFINITENESS. As shown in the last column, the island score (DD) is slightly higher for the DEFINITE condition (0.83) compared to the INDEFINITE condition (0.70), indicating a slightly higher penalty for island-violating extraction in the DEFINITE conditions. As noted above, though, this difference was not significant.

3.1.6 Discussion

Since no significant interaction was found between STRUCTURE, LENGTH, and DEFINITENESS, we cannot conclude that the definiteness of the intervening DP has an effect on
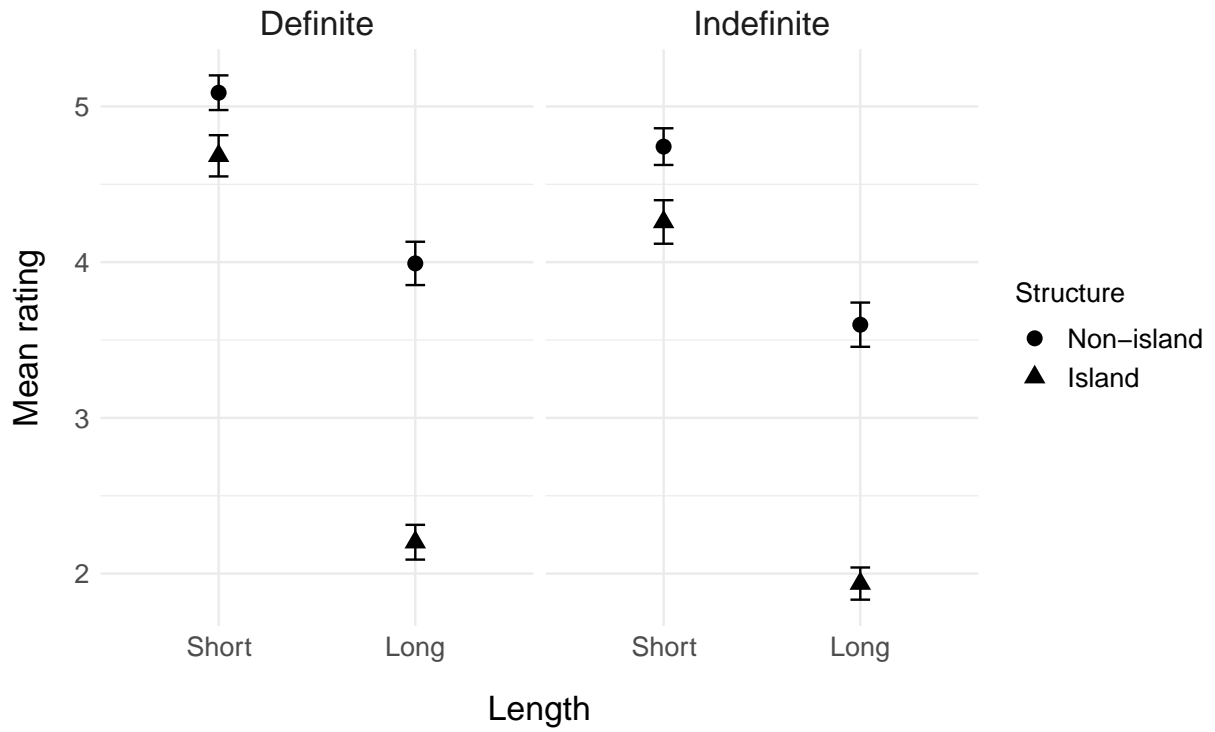
Figure 2: Experiment 1 results, faceted by DEFINITENESS and arranged by LENGTH. Error bars represent standard error.

Table 5: Experiment 1 *z*-score ratings and DD scores

DEFINITENESS	NON-ISLAND | SHORT	NON-ISLAND | LONG	ISLAND | SHORT	ISLAND | LONG	D1 (COMPLEXITY + ISLAND VIOL.)	D2 (COMPLEXITY)	DD (ISLAND VIOL.)
DEFINITE	0.75	0.09	0.53	–0.96	1.05	0.22	**0.83**
INDEFINITE	0.58	–0.11	0.24	–1.14	1.03	0.34	**0.70**

transparency to extraction. This is a surprising result on the simplistic view that definiteness is the only factor or is one of the main factors affecting transparency to extraction, as has sometimes been suggested (see fn. 3). However, on the view that the DP's presupposition status is one of the main factors affecting transparency to extraction (Sichel 2018), this result may be less surprising. DPs may only be non-presupposed in particular syntactic-semantic environments, such that even an indefinite DP might be presupposed in one environment, and a definite DP might be non-presupposed in another.

This experiment did not control for the effect that the environment of the DP containing the RC would have on the DP's presuppositionality. All DPs containing the RC were the object of one of the transitive verbs listed in (36). A small handful of these verbs might have presentational uses that allow them to be interpreted as asserting the existence of their object (possibly *notice*, *find*, *reveal*, and *know*), but most of them are unlikely to be used in a presentational context and are more likely to be used in a context in which the referent of the DP object is already assumed to exist.

(36)   EXPERIMENT 1 VERBS (CONDITIONS IN WHICH ISLAND = RC)
        notice, *trust*, *respect*, *find*, *like*, *believe*, *know*, *predict*, *understand*, *report*, *remember*, *teach*, *write*, *appreciate*, *reveal*, *suggest*

3.1.7   Interim conclusion

This section has presented the logic of the length by complexity experiment design, as well as how it can be extended to investigate the strength of an island in different definiteness environments. Experiment 1 found that the definiteness of a DP containing an RC has no significant impact on the RC's transparency to extraction, at least when those DPs are the objects of the transitive verbs in (36). The following experiment seeks to address the issue of the presuppositionality of the DP containing the RC.

4   Experiment 2

The main goal of Experiment 2 was to directly introduce a factor relating to both the presuppositionality of the DP containing the RC and whether that DP occupied a derived position or not. For the non-presupposed, non-derived-position level, the English existential construction (sentences with the expletive *there*) was used, in which the DP containing the RC is in the pivot of the existential. This was compared to both definite and indefinite DPs in the high subject position (Spec, TP), on the logic that the pivot of an existential is a non-presupposed subject in a non-derived (low) position, and high subjects occupy a derived position that may be presupposed.

The length by complexity design was abandoned for this experiment. This choice was made because it was thought that comparing derived and non-derived positions for the DP containing the RC would result in an item having conditions with substantially different sentence structures. This was likely to introduce too many confounding factors that would be difficult to control for, so a different factorial design was used that compared a

movement dependency to an anaphoric dependency, both of which were resolved in the RC island.

4.1 Participants

45 individuals participated in Experiment 2, all of which were UC Santa Cruz undergraduates who received course credit for their participation. Eight of these participants self-reported in debriefing that they were non-native speakers of English, and their data was excluded, for a total of 37 participants whose data is considered here.

A replicate dataset was collected online using Amazon Mechanical Turk. 37 individuals participated in this version, and they were paid six dollars for participating. The participants ranged from 23 to 66 years of age, with a mean age of 37.2 and a median age of 32. No participants' data was excluded.

4.2 Materials & methods

Experiment 2 employed a 3×2 factorial design that used a non-island-sensitive anaphoric dependency for the baseline conditions, which allowed all conditions to contain an RC (there were no conditions with embedded *that*-clauses). No CP complements to N were used, in contrast to Experiment 1. As mentioned above, the environment of the DP out of which subextraction occurs was controlled for to investigate whether DP position and presuppositionality affected transparency to extraction. This was coded as a three-level factor called SUBJECT. The levels were coded as THERE (for conditions in which the expletive *there* occupied the subject position), INDEFINITE (for high indefinite subjects), and DEFINITE for (high definite subjects). In the DEFINITE and INDEFINITE conditions, the tail of the dependency was located in the high subject position (Spec, TP). What is relevant for this factor is the comparison between extraction from a high subject (Spec, TP) and extraction from what might be called a low subject (see e.g. Deal 2009, p. 313). The other factor, DEPENDENCY TYPE, manipulated the type of long-distance dependency, comparing one that is typically considered to trigger island effects (MOVEMENT) to one that does not trigger island effects (ANAPHORIC).

All experimental sentences in Experiment 2 were declarative sentences. Across all conditions, the first subject was either a name or a title that was expected to be familiar to a college student (Lady Gaga, the Pope, etc.). This was done to avoid any potential additional processing costs of accommodating the existence of a referent that might be unfamiliar to the participant. In the MOVEMENT conditions, the matrix predicate was the present tense copula *is*, and its object was invariably the indefinite *someone*, within which a relative clause was embedded. Inside this relative clause was another relative clause into which the long-distance dependency was constructed. This structure was chosen to establish the kind of topic–comment relation between the highest subject and the relative clause discussed by Erteschik-Shir and Lappin (1979) and mentioned in §2.2.

In the ANAPHORIC conditions, matrix verbs were chosen that are compatible with CP complements. Care was taken not to choose matrix verbs that were too semantically complex. The verbs *know*, *believe*, *think*, *claim*, *say*, and *hope* were each used in four different items. Using CP-embedding matrix verbs eliminated the need for the long-distance

movement dependency found in the MOVEMENT conditions, allowing the replacement of the MOVEMENT conditions' gap with a pronoun that is co-referent with the matrix subject. A sample item is presented in (37).
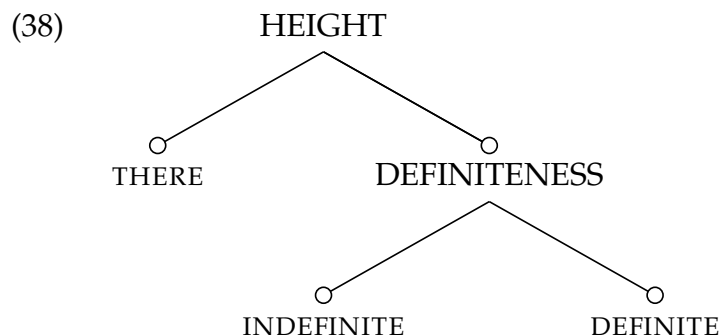
(37) EXPERIMENT 2 SAMPLE ITEM

a. The president is someone that there are many Americans who supported in the election living in rural areas.   THERE | MOVEMENT

b. The president thinks that there are many Americans who supported him in the election living in rural areas.   THERE | ANAPHORIC

c. The president is someone that many Americans who supported in the election are living in rural areas.   INDEFINITE | MOVEMENT

d. The president thinks that many Americans who supported him in the election are living in rural areas.   INDEFINITE | ANAPHORIC

e. The president is someone that the Americans who supported in the election are living in rural areas.   DEFINITE | MOVEMENT

f. The president thinks that the Americans who supported him in the election are living in rural areas.   DEFINITE | ANAPHORIC

Twenty-four items were created, for a total of 144 experimental sentences. These were distributed among six lists using a Latin Square. This allowed for four observations per condition per participant (for a total of twenty-four experimental observations per participant). Sixty-four filler sentences were adapted from the same source as Experiment 1 (Sprouse et al. 2013a). Participants therefore judged a total of eighty-eight sentences. The filler sentences were modified from the source so that their average length (14 words, vs. 10.6 words unmodified) was closer to the average length of the experimental sentences (17 words). Although the average filler length was 14 words, they ranged from 9 words to 21 words. Filler sentences were selected so that, including the experimental sentences, participants saw an equal number of expected grammatical sentences and expected ungrammatical sentences (fourty-four of each). Sixty-nine of the sentences were declarative, and nineteen were questions. For each list, the experimental sentences and filler sentences were randomized separately, shuffled together, and randomized again. The experiment was hosted and administered on IBEX Farm (Drummond n.d.).

4.3   Analysis

A mixed effects ordinal regression model was fit to the data using a cumulative link. Ratings were used as the dependent variable, and fixed effects were set as the SUBJECT factor, DEPENDENCY TYPE factor, and their interaction. A maximal random effects structure was used. Contrast coding for the three-level SUBJECT was modified to Helmert contrast coding since extraction from a low subject (in the THERE condition) was being compared to two different cases of extraction from a high subject (in the INDEFINITE and DEFINITE conditions). The INDEFINITE and DEFINITE conditions were compared directly to each

other, which is referred to as the DEFINITENESS comparison here; and the THERE condition was compared to the combination of the other two, which is called the HEIGHT comparison here. This schema is illustrated in (38).

(38)

```
                    HEIGHT
                   /      \
                  o         o
              THERE      DEFINITENESS
                         /          \
                        o            o
                   INDEFINITE     DEFINITE
```

4.4 Predictions

If only non-presuppositional DPs in non-derived positions are transparent to extraction, we expect to observe less of a penalty for extraction out of relative clauses in low subjects (in the THERE conditions) than for extraction out of relative clauses in high subjects (in the INDEFINITE and DEFINITE conditions), relative to the baseline (anaphoric) conditions. In the statistical analysis, this would surface as an interaction between DEPENDENCY TYPE and the HEIGHT comparison (THERE vs. the two high subject conditions).

If high subjects don't tolerate subextraction no matter their definiteness, then we expect to see an equally-sized penalty for extracting out of high indefinite subject and extracting out of high definite subjects, relative to their baseline conditions. Statistically, this would result in a non-significant interaction between DEPENDENCY TYPE and the DEFINITENESS comparison (INDEFINITE vs. DEFINITE).

We expect to see main effects of DEPENDENCY TYPE, since the type of dependency involved in the formation of relative clauses is more complex than a long-distance anaphoric dependency. We do not expect to see a main effect of SUBJECT, as there is no reason that comes to mind why these slightly different types of declarative sentences would consistently differ in their acceptability.

4.5 Results

4.5.1 Version 1 (Lab)

All MOVEMENT conditions were rated substantially lower than the baseline ANAPHORIC conditions, no matter which level of the SUBJECT factor is considered. This degradation is unsurprising, since all of the MOVEMENT conditions involved movement out of a relative clause. The INDEFINITE and DEFINITE conditions received nearly identical ratings to each other, regardless of dependency type. Perhaps the most notable result is that the baseline THERE | ANAPHORIC condition was rated over one point lower than both the IN-
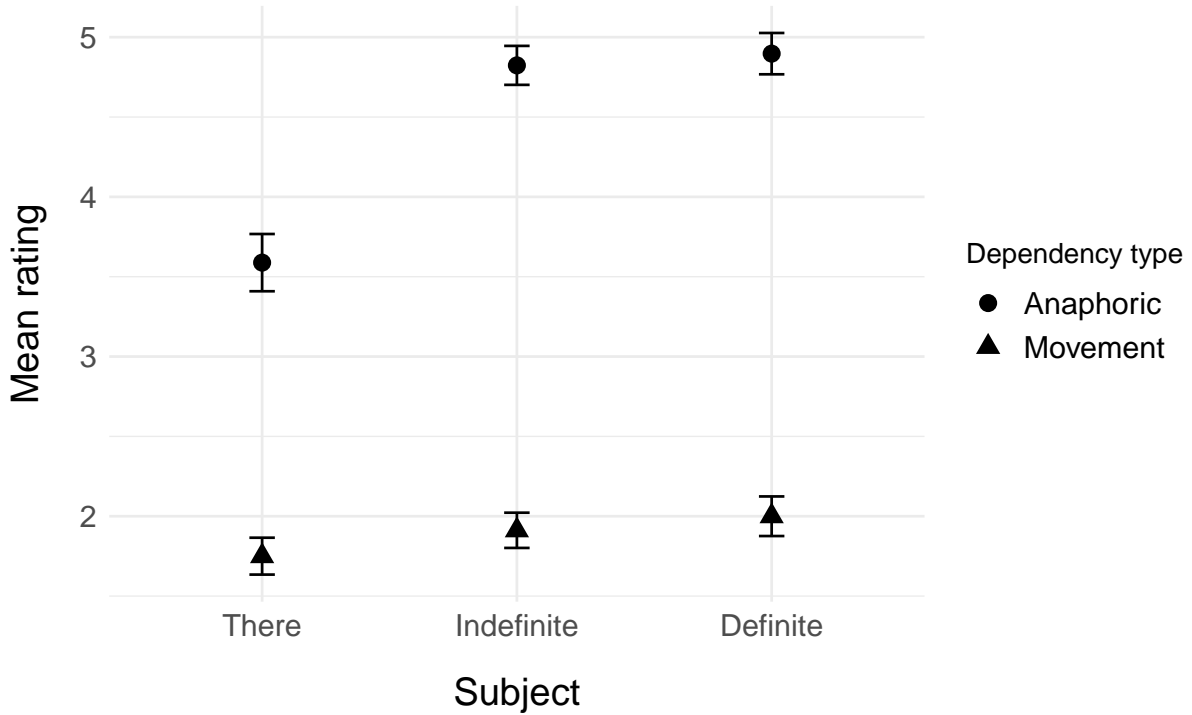
Figure 3: Experiment 2, Version 1 ratings by DEPENDENCY TYPE

DEFINITE | ANAPHORIC and DEFINITE | ANAPHORIC conditions, which was unexpected.[4]
However, the THERE | MOVEMENT condition is much closer to the baseline ANAPHORIC
condition compared to the two high subject conditions. These results are visualized in
Figure 3.

Although there was a significantly lower degradation of the THERE | MOVEMENT con-
ditions relative to the baseline ANAPHORIC condition, there is a possibility that the low
average rating of the THERE | MOVEMENT conditions is at floor—participants on average
might not have been willing to give ratings lower than 2. The concern that we may be
observing a floor effect is not diffused by looking at the average ratings of the filler sen-
tences, either. See Figure 4, which is identical to Figure 3 except that the average rating
for each filler is represented as a gray horizontal line in the background of the plot. The
filler ratings span a range slightly larger than the average ratings for the experimental
conditions, but there are only two filler sentences with an average rating lower than the
THERE | MOVEMENT conditions. Information about these filler sentences is shown in Table

---

4. One possibility that seems likely is that the THERE conditions required a costly reanalysis. In English,
it is common for existential sentences to have only a DP with a relative clause following the verb (i.e. *there
be* DP+RC), or only a DP with a VP following the verb (*there be* DP V-*ing* . . .). It may be that this post-DP
material is usually interpreted as a predication on the DP, even when the post-DP material is a RC. Upon
reading a sentence like one of the THERE | ANAPHORIC sentences in the present experiment, participants
may have been garden-pathed, parsing the RC following the DP as a predicate, but having to reanalyze it
as a restrictor within the DP when they identify a VP predicate following the material in the RC.
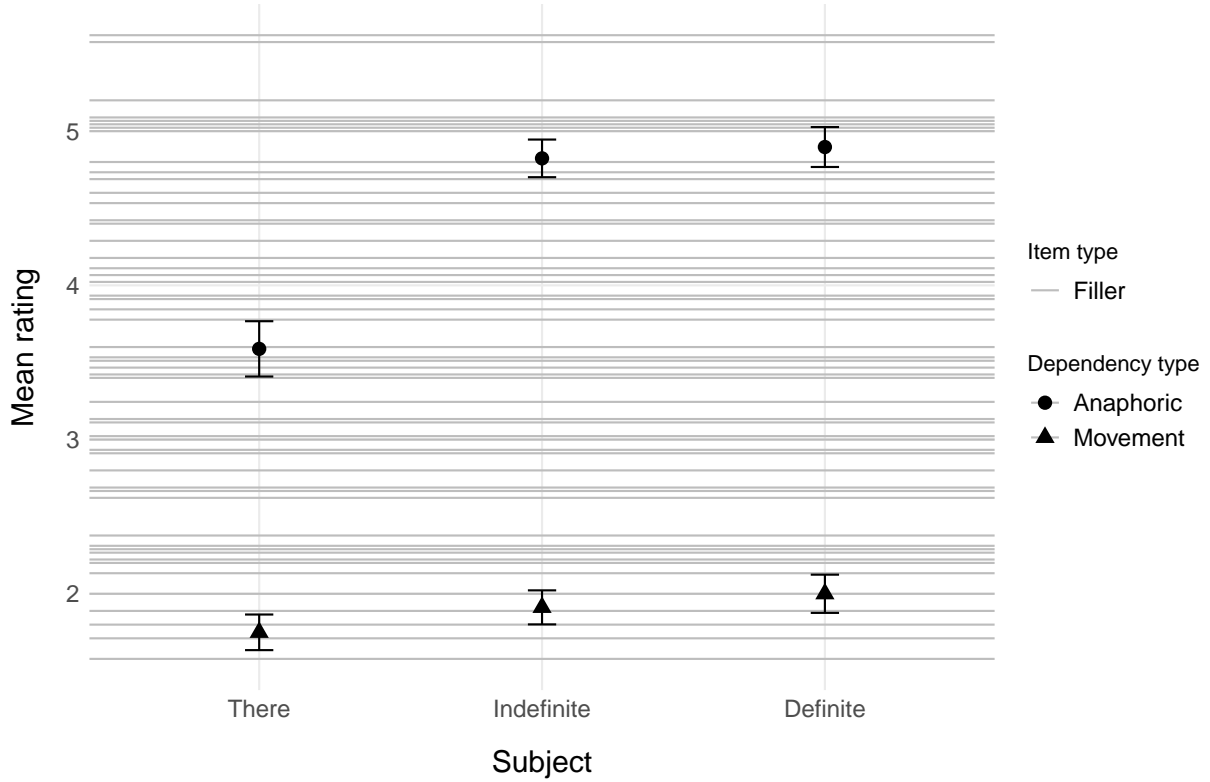
Figure 4: Ratings by dependency type with filler ratings (Experiment 2)

6.

4.5.2 Version 2 (Mechanical Turk)

The results of a second version of this experiment run on Amazon Mechanical Turk are presented in Figure 5, as it is not entirely clear from the filler ratings whether the low ratings of the THERE | MOVEMENT conditions were artificially high due to a floor effect. The materials of Version 2 were identical to those of Version 1. A rather similar ratings pattern emerged, with the INDEFINITE and DEFINITE conditions not substantially differing from each other, and with the THERE | ANAPHORIC condition receiving a relatively low

Table 6: Fillers rated below THERE | MOVEMENT (Version 1)

Filler no.	Mean rating	SD	n	SE	Filler sentence
32	1.58	0.69	45	0.10	I expect that everyone will visit Mary that you do will.
53	1.71	0.76	45	0.11	At that battle were given the generals who lost hell.
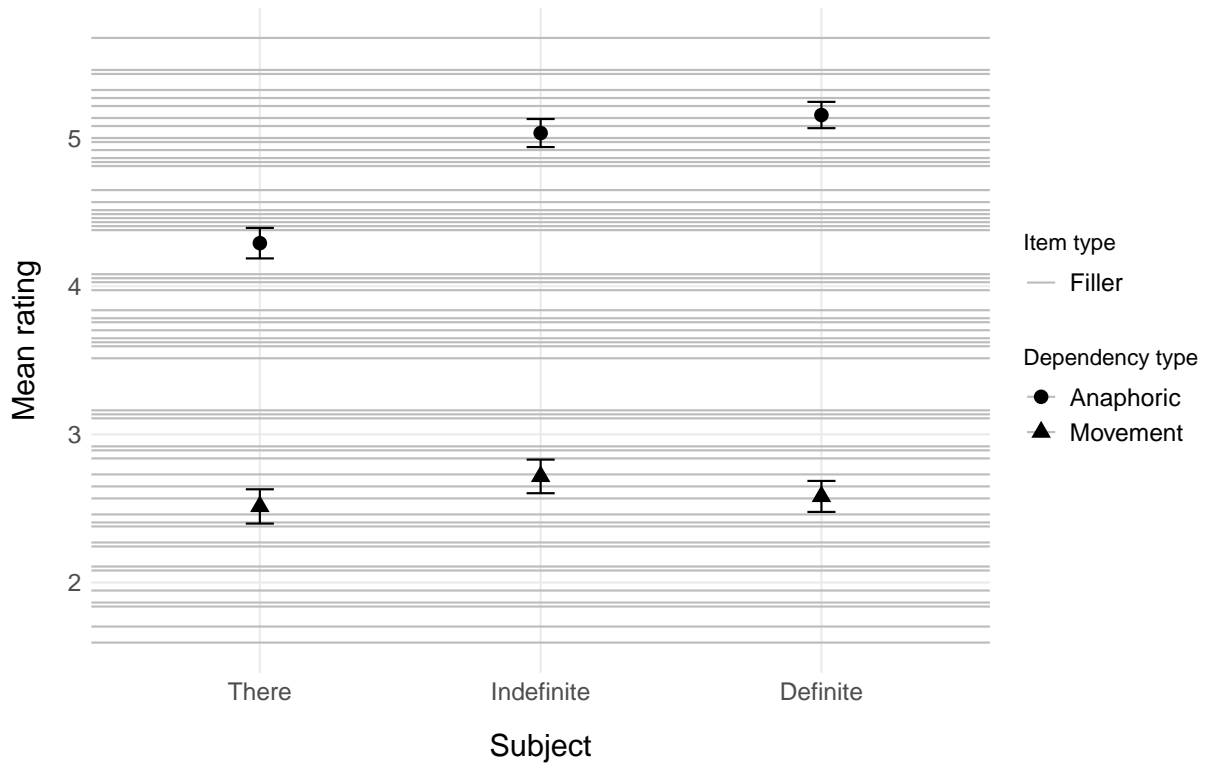
Figure 5: Experiment 2, Version 2 ratings by DEPENDENCY TYPE

rating compared to the INDEFINITE | ANAPHORIC and DEFINITE | ANAPHORIC conditions. The average ratings for each filler sentence in Version 2 make it clear that the rating of the THERE | MOVEMENT condition is not at floor. The average rating of the lowest filler in Version 2 was 1.63, and the average rating of the THERE | MOVEMENT condition was 2.53.

A mixed effects analysis (see Appendix B.2.2 for model information) revealed a significant main effect of HEIGHT ($p < 0.001$), which is perhaps unsurprising given the low baseline rating received by the THERE | ANAPHORIC condition. There was also a significant main effect of DEPENDENCY TYPE ($p < 0.001$), indicating a general island effect. Lastly, there was a significant interaction ($p < 0.001$) between HEIGHT and DEPENDENCY TYPE, indicating that DEPENDENCY TYPE had an effect on ratings that was significantly modulated by the height of the DP into which the dependency was constructed.

Interestingly, it doesn't appear to be the case that the individuals who participated via Mechanical Turk used a wider range of the scale, as the two lowest filler sentences (which were the same sentences in both versions) were rated nearly the same across versions. Instead, it appears that most of the experimental conditions were rated slightly higher on average compared to Version 1. It is not clear why this difference would emerge, but I take the abundance of filler sentences rated below the THERE | MOVEMENT condition in Version 2 to indicate that there is no floor effect.

4.6 Discussion

If there is no floor effect in either version of Experiment 2, the significant interaction between DEPENDENCY TYPE and HEIGHT supports rejecting the null hypothesis that the height of the subject (which I assume relates to the DP's presuppositionality and the derivedness of its position in this experiment) has no impact on the acceptability of forming a MOVEMENT dependency. The results are compatible with the hypothesis that RCs in existential environments are more transparent to extraction than RCs in non-existential environments. This result is surprising on the view that English bans extraction from relative clauses across the board. But on the view that English is like the languages discussed earlier in selectively allowing extraction from relative clauses, these results are not unexpected. The fact that it appears to tolerate RC subextraction in existential environments, much like the languages surveyed above, is another point in favor of a cross-linguistic explanation for this extraction pattern.

Although the results of Experiment 2 are compatible with the hypothesis that RCs in existential environments are more transparent to extraction, the design of this experiment prevents us from determining if the observed effects could be due to the presence and absence of freezing effects. It is well-known that DPs that have undergone movement become "frozen"—subextraction is no longer possible from moved DPs (see Jurka 2009, and citations therein). Since the HEIGHT comparison in this Experiment also corresponds to whether the DP in question has moved (subjects in non-existential environments raise to Spec, TP in English), it is possible that there is less of a penalty for extracting out of a RC in existential environments simply because the DP containing that RC is not frozen. Therefore, it is important to compare extraction from RCs in existential environments to extraction from RCs in other in-situ environments, such as the objects of transitive verbs. Experiment 3 attempts to fill that gap.

5 Experiment 3

Experiment 3 was designed to eliminate the potential confounds of the previous design by comparing extraction from relative clauses in three different types of in situ DPs: DPs in existential environments, DP predicates (complement of the copula), and DP objects of transitive verbs (transitive objects). This experiment returned to the length by complexity design, which allows us to calculate island effects by factoring out independent degradation caused by extraction length and the complexity of the embedded clause (island vs. non-island).

5.1 Participants

48 individuals participated in Experiment 3 via Mechanical Turk. Each participant was paid $5.00 for their participation. Two participants' data was excluded because their average rating for ungrammatical fillers was greater than or equal to their average rating for grammatical fillers. This resulted in a total of 46 participants' data being considered.

5.2 Materials & methods

Experiment 3 used a 2×2×3 factorial design similar to the design used in Experiment 1. As in Experiment 1, the first two factors used in Experiment 3 are STRUCTURE (NON-ISLAND, ISLAND) and LENGTH (SHORT, LONG). The third factor introduced a comparison between three different syntactic-semantic environments for the DP out of which RC subextraction occurs: a transitive object environment (OBJECT), a non-verbal predicate environment (PREDICATE), and an existential environment (EXISTENTIAL). Using the NON-ISLAND | SHORT conditions as baselines, we can calculate island violation penalties independently from penalties for extraction length and complexity, as discussed in §3.

The combination of these factors results in a total of 12 conditions per item. 36 items were created, one of which is given in (39). All item conditions were WH-questions. Across all conditions, one of six CP-embedding matrix verbs was used (*think*, *say*, *hope*, *believe*, *claim*, or *know*). The CP complement of one of these verbs contained one of the three ENVIRONMENT levels. This was required for maximum comparability across environments; were this not done, there would be no SHORT conditions for the EXISTENTIAL environment, since the expletive DP *there* would occupy the matrix subject position and could not undergo WH-movement.

(39) EXPERIMENT 3 SAMPLE ITEM

    a. Who thinks that Courtney saw that only one art collector bid on this painting?

<div align="right">OBJECT | NON-ISLAND | SHORT</div>

    b. Which painting do you think that Courtney saw that only one art collector bid on?

<div align="right">OBJECT | NON-ISLAND | LONG</div>

    c. Who thinks that Courtney saw the only art collector who bid on this painting?

<div align="right">OBJECT | ISLAND | SHORT</div>

    d. Which painting do you think that Courtney saw the only art collector who bid on?

<div align="right">OBJECT | ISLAND | LONG</div>

    e. Who thinks that Courtney believes that only one art collector bid on this painting?

<div align="right">PREDICATE | NON-ISLAND | SHORT</div>

    f. Which painting do you think that Courtney believes that only one art collector bid on?

<div align="right">PREDICATE | NON-ISLAND | LONG</div>

    g. Who thinks that Courtney believes that she is the only art collector who bid on this painting?

<div align="right">PREDICATE | ISLAND | SHORT</div>

    h. Which painting do you think that Courtney believes that she is the only art collector who bid on?

<div align="right">PREDICATE | ISLAND | LONG</div>

    i. Who thinks that there is only one art collector bidding on this painting?

<div align="right">EXISTENTIAL | NON-ISLAND | SHORT</div>

    j. Which painting do you think that there is only one art collector bidding on?

<div align="right">EXISTENTIAL | NON-ISLAND | LONG</div>

    k. Who thinks that there is only one art collector who bid on this painting?

l.   Which painting do you think that there is only one art collector who bid on?

In all PREDICATE conditions (39h-39e), the main verb of the first embedded clause had another CP complement. In the PREDICATE | NON-ISLAND conditions, this was the final embedded clause, but in the PREDICATE | ISLAND conditions, this second embedded clause contained a non-verbal (DP) predicate that contained a relative clause. Although this resulted in the PREDICATE | ISLAND conditions containing three embedded clauses (two CP complements to V, and one RC) and the PREDICATE | NON-ISLAND conditions containing only two embedded clauses (two CP complements to V), it allowed the predication in the embedded clause to remain relatively similar across the ISLAND and NON-ISLAND PREDICATE conditions. This was based on the assumption that the copula *be* is trivial to compute as a predicate compared to a CP-embedding verb like *believe*. Without balancing the predication relations in this way, the PREDICATE | ISLAND conditions would be less comparable to the PREDICATE | NON-ISLAND conditions due to the more trivial computation required for the embedded verb. The predication relations for these conditions are illustrated schematically in (40); compare to (41), which shows the predication relations that would be involved if a second embedded clause were not used in the PREDICATE | ISLAND conditions.

(40)   Balanced predication (PREDICATE condition)

   a.   ISLAND   [WH … *think* [CP … *believe* [CP [DP] *be* [DP [RC]]]]]

   b.   NON-ISLAND [WH … *think* [CP … *believe* [CP [DP] V [DP]]]]

(41)   Unbalanced predication (PREDICATE condition)

   a.   ISLAND   [WH … *think* [CP … *be* [DP [RC]]]]

   b.   NON-ISLAND [WH … *think* [CP … *believe* [CP [DP] V [DP]]]]

In the EXISTENTIAL conditions (39l-39i), the same CP-embedding matrix predicate was used, and this embedded clause contained the existential *there* construction. In the EXISTENTIAL | NON-ISLAND conditions, the pivot of the existential is the external argument of a (present participial) verb. In the EXISTENTIAL | ISLAND conditions, the pivot of the existential is a DP followed by a relative clause which hosts the same verb as the NON-ISLAND version. These conditions are presented schematically in (42), abstracting away from the extraction length factor.

(42)   EXISTENTIAL conditions

   a.   ISLAND   [WH …*think* [CP *there be* [DP [RC *who* V [DP]]]]]

   b.   NON-ISLAND [WH …*think* [CP *there be* [DP] V-*ing* [DP]]]

For the OBJECT conditions (39d-39a), main verbs were chosen for the first embedded clause that are compatible with either CP or DP complements and don't seem to be too

biased towards one complement type. In the OBJECT | ISLAND conditions, this verb had a DP complement that contained a relative clause, and in the OBJECT | NON-ISLAND conditions, the verb had a CP complement.

Every experimental condition contained the word *only* as part of the DP used as the head of the relative clause in the ISLAND conditions. This was done because the presence of *only* seems to improve extraction from relative clauses and may ensure a non-presuppositional reading (Ivy Sichel, p.c.). The use of the definite article alone is typically taken to presuppose that there is a unique, contextually salient individual that satisfies the NP restrictor. Adding *only* to a *the*-DP raises the presupposition that there exists a unique individual that satisfies the NP restrictor to an assertion (at-issue entailment), making the DP non-presupposed. In the ISLAND conditions except for those in the EXISTENTIAL environment, the DP contained the definite article followed by *only* (*the only*+NP). In all other conditions, the DP consisted of *only one*+NP.

The use of *only one*+NP in certain conditions was necessary to ensure grammaticality in the EXISTENTIAL conditions (due to the definiteness restriction: Milsark 1974) and to ensure naturalness in the NON-ISLAND conditions. When *the only*+NP is not followed by a relative clause, it seems to lose its non-presuppositional status and becomes somewhat infelicitous. Furthermore, maintaining *the only*+NP across both ISLAND and NON-ISLAND conditions results in the NON-ISLAND conditions having different entailments (43), but switching to *only one*+NP in the NON-ISLAND conditions allows the entailments to remain constant (44).

(43) Unbalanced entailments ($a \neq b$)

  a. …she is the only art collector who bid on this painting. → out of potentially many art collectors, there is one who bid on the painting

  b. …the only art collector bid on this painting. → there is only one art collector, and that art collector bid on the painting

(44) Balanced entailments ($a = b$)

  a. …she is the only art collector who bid on this painting. → out of potentially many art collectors, there is one who bid on the painting

  b. …only one art collector bid on this painting. → out of potentially many art collectors, there is one who bid on the painting

5.2.1 Filler sentences

Filler sentences for Experiment 3 were again taken from the same source as Experiments 1 and 2 (Sprouse et al. 2013a). A total of 72 filler sentences were used. Sentences were adjusted for length as before, and some new sentences were created for an appropriate balance of ungrammatical and grammatical sentences, and questions and declaratives. Considering both experimental and filler sentences, each participant rated 108 sentences, half of which were questions, half of which were declaratives. Half of the total number

of sentences were expected to be grammatical, and half were expected to be grammatical. Since all of the experimental sentences contained the word *only*, half of the fillers were modified to contain *only*, so that out of the 108 sentences each participant rated, 72 sentences contained *only* and 36 did not.

5.3 Analysis

A mixed effects ordinal regression model with a cumulative link was fit to the data. The dependent variable was set to rating, and the ENVIRONMENT, STRUCTURE, and LENGTH factors, as well as their interactions, were set as fixed effects. A maximal random effects structure was used.

For the three-level ENVIRONMENT factor, contrast coding was modified to Helmert contrast coding. This was done because of the expectation that the EXISTENTIAL and PREDICATE conditions would display similar patterns, since previous work identified these two environments as being compatible with non-presuppositional DPs. Thus, the EXISTENTIAL and PREDICATE conditions were compared directly to each other. This comparison is referred to as the BE comparison, since both of these conditions have the copula *be* immediately before the DP containing the RC. The mean of these conditions was compared to the OBJECT condition, which is referred to as the TRANSITIVITY comparison. These comparisons are illustrated with the graphic in (45).

(45)

TRANSITIVITY

OBJECT   BE

PREDICATE   EXISTENTIAL
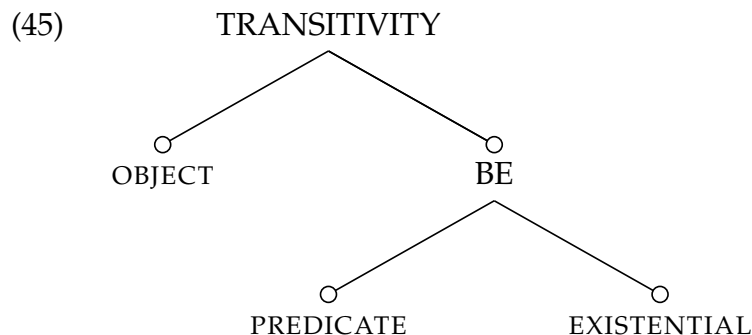
5.4 Predictions

Since the ISLAND | LONG conditions involve extraction out of a RC and this is generally known to result in degradation, these conditions are expected to be rated significantly lower than the other conditions. In the statistical analysis, this would show up as an interaction between LENGTH and STRUCTURE.

On the hypothesis that both the EXISTENTIAL and PREDICATE conditions are more tolerant of RC subextraction than the OBJECT condition, we expect to see a significant three-way interaction between STRUCTURE, LENGTH, and the TRANSITIVITY comparison (refer to (45)).

Finally, if either the EXISTENTIAL or PREDICATE conditions is more tolerant of RC subextraction than the other, we expect to see a significant three-way interaction between

LENGTH, STRUCTURE, and the BE comparison. We have no reason to find one of these environments more transparent than the other.

5.5 Results

Overall, the collection of OBJECT conditions received the lowest ratings, followed by the PREDICATE conditions, followed by the EXISTENTIAL conditions. Each environment had a significant effect on ratings, as the analysis revealed significant main effects of both the BE comparison and the TRANSITIVITY comparison ($ps < 0.001$). Aside from this, each environment has a roughly similar ratings pattern that is more or less familiar from Experiment 1: the ISLAND | LONG conditions are rated the lowest for each environment, followed by the NON-ISLAND | LONG conditions. Both length and structure had significant main effects ($ps < 0.001$).

In both OBJECT | SHORT conditions, STRUCTURE appears to have had no impact on ratings, as is also the case in the PREDICATE | SHORT conditions. In the EXISTENTIAL | SHORT conditions, however, the NON-ISLAND and ISLAND levels pull apart in the expected way, with the NON-ISLAND | SHORT condition being rated slightly higher than the ISLAND | SHORT condition. The means for each condition are presented in Figure 6. The error bars in the plot represent standard error.

The ISLAND | LONG conditions are rated lowest for each environment, and they are rated much lower than the NON-ISLAND | LONG conditions relative to the SHORT conditions. This is the expected island effect, and in the mixed effects analysis, it showed up as a significant interaction between STRUCTURE and LENGTH ($p < 0.001$).

Considering the noticeable island effect for each ENVIRONMENT, one will also notice that the island effect appears to be more pronounced in the OBJECT environment relative to the other two environments. Compared to the other environments, the ISLAND | LONG condition is rated much lower. To more easily observe the island effect observed for each environment, a difference-in-differences (DD) score is calculated for each environment and presented in Table 7. The DD scores are calculated based on z-scores for maximum comparability across participants.[5] The DD score is calculated as laid out in §3.

As can be seen in Table 7, the DD score for the OBJECT environment is substantially higher than those for the PREDICATE and EXISTENTIAL environments. This difference between environments was statistically significant in the mixed effects analysis, showing up as an interaction between the TRANSITIVITY comparison, STRUCTURE, and LENGTH ($p = 0.0104$).

5.6 Discussion

The results of Experiment 3 suggest that RCs are significantly more transparent to extraction in both existential and predicate nominal environments as compared to transitive

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5. Z-scores were calculated using the following procedure. All ratings data (including experimental sentences and fillers) was separated by participant, and z-scores were calculated for each rating. The data was recombined and then grouped by item and condition, and a mean z-score was calculated for each item and condition. Based on this mean, another mean z-score was calculated for each condition, averaging across items.
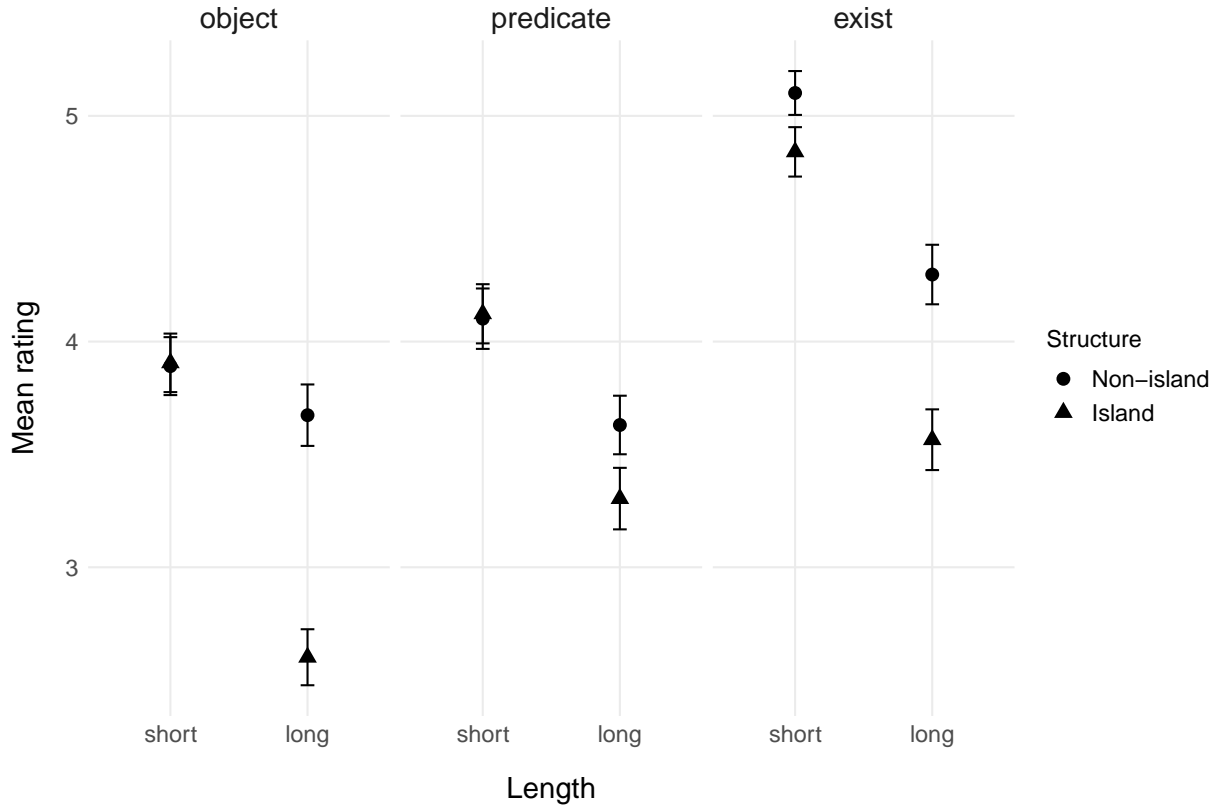
Figure 6: Mean ratings faceted by ENVIRONMENT, arranged in columns by LENGTH

Table 7: Calculating DD scores (Island scores) for each environment

ENVIRONMENT	NON-ISLAND|SHORT	NON-ISLAND|LONG	ISLAND|SHORT	ISLAND|LONG	D1 (COMPLEXITY + ISL. VIOL.)	D2 (COMPLEXITY)	DD (ISL. VIOL.)
OBJECT	0.17	0.09	0.17	–0.53	0.62	0.00	**0.62**
PREDICATE	0.30	0.04	0.29	–0.13	0.18	0.02	**0.16**
EXISTENTIAL	0.85	0.42	0.71	0.02	0.40	0.14	**0.26**

object environments. As seen in the DD table, the island score for the OBJECT environment is markedly higher than the other two environments, which is expected under the hypothesis that relative clauses in transitive object environments are less transparent to extraction than those in either existential or predicate nominal environments.

6   General discussion

The findings from both Experiment 2 and Experiment 3 indicate that cases of extraction from RCs receive less of an acceptability penalty when that RC is in an existential or predicate nominal. Experiment 2 indicates that cases of extraction from RCs embedded in the pivot of an existential environment receive less of a penalty than similar extractions from RCs embedded in high subjects. Experiment 3 showed that even when compared to extraction from RCs within the object of a transitive verb (which is presumably in situ, and should not be frozen), extraction from an RC in the pivot of an existential still receives a comparatively small penalty. Experiment 3 also showed that cases of extraction from an RC in the DP predicate of a copular clause pattern with the existential cases. The DD scores from Experiments 1 and Experiments 3 are combined in Table 8 for comparison, and the DD scores for a number of other length by complexity studies on WH-islands are presented for reference. Note that the predicate nominal DD score from Experiment 3 is one of the lowest DD scores in the table, even among DD scores from languages that are claimed not to have WH-islands.

These findings are compatible with the claim that RCs are not always strong islands and are more transparent to extraction in particular environments, squaring English with the range of languages discussed in §2 and validating claims from limited earlier work on English such as Chung and McCloskey (1983). The claim that RCs are not always strong islands is noteworthy for a number of reasons, one of which is historical. When it first emerged in the generative linguistics literature (to my knowledge, starting with Erteschik-Shir 1973) that Danish would present a problem for Ross's Complex NP Constraint, Danish was perhaps thought to be an exception.[6] Even though particular languages may be exceptional in some way, generative linguists, striving to build a universal theory, take exceptions as evidence that the theory needs to be modified in some way. Based on the apparent Danish exceptions (and the generalizations she identified), Erteschik-Shir concluded that the structural constraint (like the Complex NP Constraint) must be abandoned altogether, and a nonstructural generalization must be developed that can capture both the generalizations and the apparent exceptions. Others have concluded either that the structural constraints need to be fine-tuned or parameterized in some way, or that processing principles should explain the apparent variation.

As more languages were identified that behaved like Danish (starting with other Scandinavian languages[7]), it became apparent that there may be a whole class of languages that are exceptional in this way. In the literature that discusses such exceptional languages, English is often considered as the non-exception—the language that is the least problematic for the Complex NP Constraint and its later reformulations. Now that it is

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6. In her dissertation (1973), Erteschik-Shir refers to Danish as an exceptional language in this regard.
7. Norwegian (Taraldsen 1982) and Swedish (Allwood 1982).

Table 8: Combined DD scores for Experiments 1 and 3, and other length × complexity work on WH-islands as cited in Keshev and Meltzer-Asscher (2018)

Language	Source	ISLAND | LONG rating	DD	p
English	Exp. 1: Def. trans. object	–0.96	0.83	
	Exp. 1: Indef. trans. object	–1.14	0.70	
	Exp. 3: Transitive obj.	–0.53	0.62	
	Exp. 3: Predicate nominal	–0.13	0.16	
	Exp. 3: Existential	0.02	0.26	
English	Sprouse et al. (2016)	–0.79	0.40	0.022
Italian	Sprouse et al. (2016)	–0.53	0.67	0.023
Swedish	Kush et al. (2015)	~0.25	n.a.	<0.001
Norwegian	Kush et al. (2018)			
	Exp. 1: Bare WH	0.25	0.69	<0.001
	Exp. 2: Bare WH	0.40	0.44	<0.01
	Exp. 3: Complex WH	0.60	0.27	<0.01
Br. Portuguese	Almeida (2014) (Exp. 1)	~–0.1	n.a.	0.0012
Slovenian (object extraction)	Stepanov et al. (2018)	–0.33	–0.02	0.84
Slovenian (subject extraction)	Stepanov et al. (2018)	–0.94	–0.42	0.009
Hebrew (object extraction)	Keshev et al. (2018) (Exp. 1)	–0.29	0.47	<0.001
Hebrew (subject extraction)	Keshev et al. (2018) (Exp. 5)	–0.27	0.05	0.7

apparent that English may exhibit the same effects as the "exceptional" languages, it is even more clear that a cross-linguistic explanation for these effects is desired, and that language-specific formulations of the constraints surrounding extraction from relative clauses are not needed.[8]

Since a more cross-linguistic explanation is desired for these effects, it is worth asking if any of the accounts intended to account for the patterns discussed for particular languages in §2 can account for the English patterns without modification. Although the pragmatic account of Erteschik-Shir and Lappin (1979) may very well work for English, the debate around island phenomena currently centers around whether a structural account or a psycholinguistic processing account is better. Taraldsen (1982) proposed that in order for acceptable RC subextraction to occur, the RC must be extraposed, even when this extraposition is string-vacuous. Such extraposition separates the RC from the NP to which the RC was adjoined, which he claims to be the barrier to extraction. Although Engdahl notes that Taraldsen's analysis has the benefit of capturing the fact that in most cases the RC that is extracted from is clause-final, the analysis can't explain the results from Experiment 2, in which it is evident that the RC hasn't been extraposed, since there is overt material between the right edge of the RC and the right edge of the clause,[9] as shown in (46), repeated from (37) with structural annotation.

(46)   The president is someone that. . .
        [$_{TP}$ there [$_{vP}$ are [$_{DP}$ many Americans who supported ____ in the election] living in rural areas]].

Cinque (2010) points out that most of the acceptable cases of RC subextraction in the languages he discusses have RCs with a complementizer (instead of a relative pronoun), and that when they do have a relative pronoun, the RC is a subject RC. Similar in spirit to Chung and McCloskey (1983), he argues that RCs with complementizers instead of relative pronouns are not derived via movement, and that subject RCs that have relative pronouns leave the relative pronoun in subject position. Because of this, the Spec, CP position is left open and can be used as an escape hatch for movement. This argument is based on the absence of word-order evidence for these RCs being derived by movement.

The remaining structural account is that of Sichel (2018). Sichel argues that two overlapping structural factors must coincide in order for RC subextraction to occur. First, the RC must be a Raising RC (as opposed to a Matching RC; see Hulsey and Sauerland 2006). Raising RCs are argued to be direct complements of D, and therefore lack an NP layer. Sichel suggests that NP is a phase, and that its absence when there is a Raising RC allows an element at the edge of CP to be targeted for movement. This requires that CP

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8. Although she doesn't actually formulate any language-specific constraints, Engdahl (1997) suggests that there are no structural differences between the Scandinavian languages and English, and that the difference boils down to the availability (and frequent use) of potentially long-distance topic fronting in Scandinavian languages and the relative unavailability of topic fronting in English. Although it is not clear whether this would be formulated as a grammatical phenomenon or a processing phenomenon, a reasonable elaboration of Engdahl's claim is that the availability and frequent use of topic fronting in Scandinavian languages led (diachronically) to the grammaticization of extraction from relative clauses. Under the assumption that languages like English don't exhibit the same effect, this would probably require positing language-specific constraints on extraction from relative clauses.

9. It is possible that participants are parsing the *-ing* VPs as reduced relatives, in which case one can't argue against adopting Taraldsen's account on this basis.

be able to host multiple specifiers[10] (one for the RC's head NP, and one for the extracted constituent), or that the C domain be expanded into multiple heads (a lower head for the head NP and a higher one for the extracted constituent), which is what she proposes.

Second, the DP that contains the RC must be in a non-derived position, as DPs in derived positions are known to give rise to freezing effects, the phenomenon in which a DP that moves out of its base position is no longer transparent to extraction. Sichel connects the observation that the RC needs to be in a non-presupposed DP to this factor by arguing (along with Diesing 1992) that presupposed DPs always undergo movement, which is string vacuous or covert in some languages, including Hebrew. Presupposed DPs, then, will not be transparent to extraction. In this way, Sichel ties the contextual nature of acceptable RC subextraction to the contextual nature of non-presupposed DPs: the type of clause or predicate determines whether a DP will carry a presupposition or not. Canonical existentials, for example, do not presuppose the existence of the referent of the DP pivot because their function is to assert existence. Canonical existentials are one of the environments that enable RC subextraction in all of the languages discussed in §2, as well as in English, as argued for in the current paper.

I know of no reason not to adopt the analysis of Sichel (2018) for English. Both of the factors that Sichel argues enable RC subextraction are independently argued to obtain for English. It has already been argued that English has both Matching and Raising derivations for RCs (Bhatt 2002; Hulsey and Sauerland 2006, among others), and Diesing's claim that presuppositional DPs must raise is intended to apply not only to other languages, but also to English. There is at least one way in which this analysis can be tested for English: although presupposed DPs are required to raise, nonpresupposed DPs may either remain in situ or raise. If it really is movement that gives rise to the contextual ban on RC subextraction and not something about the semantics or pragmatics of asserting existence, then nonpresuppositional DPs that have moved should exhibit freezing effects, despite being nonpresupposed.

In English, the existential clause can be passive, in which case it is evident that while the subject is lower than Spec, TP, it is not in situ either, occurring before the verb instead of after it (47). On analogy with the existential sentences in Experiment 3, a future experiment might test whether there is any evidence of freezing effects in examples like (48).[11]

(47) There was only one undergraduate arrested at the strike.

(48) Which petition do you think that there is only one undergraduate who signed arrested at the strike?

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10. This happens to be what Lindahl (2015) proposes for cases of RC subextraction in Swedish.

11. Of course, this rests on the assumption that the material following *one undergraduate* in (47) is a vP/VP, and not, say, a reduced relative clause. It has been argued that existentials with passive material following the pivot are in fact reduced relatives (Law 1999), in which case the assumptions underlying the hypothesized experiment above would not be valid.

6.1 The grammatical status of RC subextraction

It has been assumed so far in this discussion that there are grammatical cases of RC subextraction: when the conditions are right, the grammar will generate sentences in which a constituent has been extracted from a relative clause. It is worth pausing here to ask whether it is desirable to have a grammar that generates such sentences, what the consequences of this assumption are, and whether there are any challenges to adopting this view.

Adopting a grammatical explanation for acceptable cases of RC subextraction allows us to account for the effects found in the present study: there is a statistically significant increase in acceptability in certain classes of RC subextraction compared to others. However, despite the significant increase in acceptability, it is still not the case that these classes of RC subextraction are perfectly acceptable. In Experiment 3, there is still a significant interaction between LENGTH and STRUCTURE across all conditions—a general island effect. Even once acceptability penalties for long-distance extraction and the presence of an island are calculated and factored out, there is still a certain amount of degradation that remains unaccounted for, which is visible as a positive island score for the PREDICATE (0.162) and EXISTENTIAL (0.256) conditions in the DD score table (Table 7). Of course, these island scores are substantially lower than the transitive object conditions (0.623), but the point is that there still remains some amount of degradation that remains unaccounted for.

Almeida (2014) uses the presence of a super-additive interaction in his study on Brazilian Portuguese embedded WH-questions to argue that despite the relatively high acceptability of cases of extraction from WH-questions, Brazilian Portuguese WH-questions do not tolerate subextraction—they are what he calls "subliminal islands". Under this view, the finding that a super-additive interaction still remains in the current PREDICATE and EXISTENTIAL long extraction conditions should be taken to indicate that RCs in those conditions are still islands, and sentences with subextraction from those RCs should not be generated by the grammar.

Following up on Almeida's study, Keshev and Meltzer-Asscher (2018) investigate embedded WH-questions in Hebrew, another language which has been argued not to have WH-islands. Similar to Almeida, they find that despite the relatively high acceptability ratings given to cases of extraction from embedded WH-questions, a super-additive interaction between LENGTH and the STRUCTURE is found. Using the logic from Almeida (2014), this should be taken to suggest that Hebrew does have WH-islands. However, Keshev and Meltzer-Asscher hypothesize that the super-additivity is the result of a processing effect that was uncontrolled for. More specifically, they suggest that the super-additive interaction in their first two Experiments is due to two filler-phrases needing to be maintained in memory simultaneously: the head NP of the relative clause, and the WH-phrase associated with the embedded question. The head NP is resolved in an object position in the embedded question, and the WH-phrase *matay* 'when' is presumably resolved near the right edge of the embedded question. The structure of their embedded question subextraction condition is given in (49).

(49) …FILLER$_i$ [$_{RC}$ that ……… [when …… ___$_i$/RP$_i$]]

<div align="right">(Keshev and Meltzer-Asscher 2018, example (7d))</div>

Their fourth experiment minimized the time for which both dependencies would need to be active simultaneously by resolving the head NP in the embedded subject position instead of the embedded object position, as illustrated in (50). Since the initial filler phrase is resolved immediately after the left edge of the embedded question, the time for which two filler phrases have to be maintained in memory simultaneously is reduced. They predict that the super-additive interaction should be eliminated, and it is.

(50) …FILLER$_i$ [$_{RC}$ that ……… [when RP$_i$ ……]]

<div align="right">(Keshev and Meltzer-Asscher 2018, example (11d))</div>

It is not clear that the super-additivity found in the current PREDICATE and EXISTENTIAL conditions could be due to interference with memory maintenance because the materials of Experiment 3 do not require multiple fillers to be maintained for the duration of the embedded clause, as was the case in Keshev and Meltzer-Asscher's first two experiments. Instead, they more closely resemble the materials for Keshev and Meltzer-Asscher's fourth experiment, since one of the filler phrases is resolved in subject position and the other is resolved in object position (as schematized in (51); lines added for clarity). It is worth noting that in their fourth experiment, the highest filler phrase is what is resolved in the embedded subject position, and the lowest filler phrase is resolved at the right edge of the clause, such that their embedded question subextraction conditions involve two dependencies of intermediate length (as illustrated in (52)).

(51) WH$_i$ ……… FILLER$_j$ [$_{RC}$ who ___$_j$ …… ___$_i$]

(52) …FILLER$_i$ [$_{RC}$ ……… [$_{EQ}$ WH$_j$ ___$_i$ …… ___$_j$]]

In the present Experiment 3, the highest filler phrase is resolved in the embedded *object* position, and the lower filler phrase is resolved immediately in the embedded subject position, such that the RC subextraction conditions involve one long dependency and one very short dependency. It is conceivable that in the course of constructing the long dependency, the highest filler phrase suffers from a greater amount of memory decay than the combined decay of the filler phrases in Keshev and Meltzer-Asscher's fourth experiment, causing difficulty in retrieval and giving rise to the super-additive interaction.

It is not possible to test this hypothesis by creating an experiment whose materials have the same dependency lengths as in Keshev and Meltzer-Asscher's fourth experiment, as it would be ungrammatical to resolve the highest filler phrase in the embedded subject position (53).

(53) *Who$_i$ do you think that there is only [one painting]$_j$ that/which ___$_i$ bid on ___$_j$?

However, the hypothesis could be tested in other ways. In Experiment 3, the long-distance extraction conditions all involved movement of a D-linked WH-phrase such as *which painting*.[12] The use of a D-linked WH-phrase has been argued to enhance memory encoding and facilitate retrieval relative to a non-D-linked WH-phrase like *who* (see Goodall 2015, and references therein). Although the use of D-linked WH-phrases in Experiment 3 should have given these examples the best chance, it is still possible that D-linking was not enough to completely reduce an acceptability penalty cause by some amount of retrieval difficulty. However, if the remaining super-additive interaction in Experiment 3 were due to memory retrieval challenges, then we would predict the super-additive interaction to grow when the filler phrase is more challenging to retrieve, such as when it is non-D-linked.

An alternative possibility is that encoding the second filler phrase in memory interferes with the representation of the first filler phrase in memory (as Keshev and Meltzer-Asscher argue occurred in their first two experiments). This might be a somewhat surprising hypothesis, given their finding that when one of the filler phrases is resolved in the embedded subject position, the super-additive interaction disappears (presumably indicating that there is no interference caused by the second filler phrase). However, there are two relevant differences between the design of their fourth experiment and the design of the present Experiment 3 that might lead us to expect some level of interference.

First, in their materials the first filler phrase was the head NP of a RC, while the second filler phrase was a WH-word licensed by the embedded question. The presence of question features on their second filler phrase might have been enough to differentiate it from the first filler phrase and minimize interference between the two. In the current Experiment 3, the initial filler phrase is a (D-linked) WH-phrase, and the second filler phrase was a head NP whose relative clause was initiated by the relative pronoun *who*. Although the English relative pronoun *who* is not expected to have question features, it is homophonous with the interrogative *who*, and it is likely that the interrogative *who* receives temporary activation[13] and has the potential to interfere with the maintenance or retrieval of the D-linked WH-phrase. Since the Hebrew RCs in Keshev and Meltzer-Asscher's materials are headed by a complementizer, this potential confound does not arise for them. If this confound is present in Experiment 3, it could conceivably be eliminated by running a modified version that replaces the relative pronoun with the complementizer *that*.[14]

Second, their initial filler phrase was an animate DP (at least in their sample items), while the second filler phrase was invariably the WH-word *matay* 'when', which has no person features and is therefore quite distinct from the first filler phrase. In the long-distance RC subextraction conditions of Experiment 3, the first filler phrase was always an

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12. I am using the term "D-linked" following Pesetsky (1987), who calls WH-words with NP complements D-linked because they require that the answer to the question select an individual from the discourse, while WH-words without NP complements do not have the same requirement.

13. Research on lexical activation has shown that even when the context is compatible with only one interpretation of a homophone, the incompatible interpretation still receives some degree of activation (see Lucas 1999 for a meta-analysis). Although to my knowledge such effects have not been demonstrated for interrogative *who* vs. relative pronoun *who*, I assume such effects still exist for these lexical items.

14. The December 6, 2018 draft of this paper contained a factual error in this paragraph about the materials of Experiment 3. It was mistakenly written that both filler phrases in Experiment 3 were head NPs. As of the January 24, 2019 draft, the error has been corrected.

inanimate DP, and the second filler phrase was always an animate DP. While the animacy features surely differentiate these filler phrases in memory, it might be that an inanimate DP and animate DP are more similar to each other than an animate DP and *when*, which is not only inanimate but abstract.

The remaining super-additive interaction found for the PREDICATE and ISLAND conditions may be due to a combination of these factors (interference caused by needing to establish an intermediate dependency, which may be modulated by the similarity of the features involved in that intermediate dependency to the unresolved dependency). While the design of Experiment 3 is able to be used to factor out the acceptability cost of the long-distance component of the extraction, it can't be used to factor out any acceptability cost arising from the need to encode the second filler phrase and resolve it, all while continuously maintaining the first filler phrase. If this hypothesis is on track and the remaining super-additivity in these conditions is due to processing factors, it is unproblematic for the grammar to generate cases of RC subextraction in such limited cases.

6.2   Methodological considerations

Since the present investigation uses two different experimental designs, it is worthwhile to consider which of these designs is more effective for estimating the strength of an island. As shown in detail in §3, the length by complexity design used in Experiments 1 and 3 provides a way to isolate the ratings penalty for extracting out of an island. With certain educated assumptions in place about the various processing costs at play in the conditions of a length by complexity experiment, isolating the penalty of processing an island subextraction is achieved arithmetically (as shown in (27–29) in §3). Because this design allows this effect to be isolated from other processing effects, comparison of results across different experiments is safer, as long as the ratings are properly *z*-scored.

In contrast, the design of Experiment 2 (call it the DEPENDENCY TYPE design) does not provide a way to isolate the effect of processing an island subextraction, and drawing conclusions about the relative strength of an island from a dependency type design requires making assumptions that cannot be validated by the experiment itself. To explain this, let us consider the processing costs at play in the conditions of a dependency type experiment. Consider a pared-down version of Experiment 2 that only studies one syntactic-semantic environment for the DP out of which extraction occurs—say, the existential environment. Each item would have two conditions—ANAPHORIC and MOVEMENT. To ease the discussion, the THERE conditions of the sample item in (37) are presented in (54).

(54)   DEPENDENCY TYPE EXPERIMENT SAMPLE ITEM

    a.   The president thinks that there are many Americans <u>who supported him in the election</u> living in rural areas.   THERE | ANAPHORIC

    b.   The president is someone that there are many Americans who supported in the election living in rural areas.   THERE | MOVEMENT

The ANAPHORIC condition is taken to be the baseline condition, with some baseline penalty β related to parsing the sentence with its particular lexical items and structures.

This baseline penalty includes the cost of the (underlined) RC present in (54a), as well as the cost of processing the anaphoric dependency, which I assume to be trivial.[15] The MOVEMENT condition, on the other hand, involves the same baseline cost β, as well as the cost of processing the additional RC (a COMPLEXITY penalty), the cost of actively maintaining the head of the highest RC in memory until its gap is identified (a LENGTH) penalty, and the cost of forming this dependency into an island (an ISLAND VIOLATION penalty). These costs are shown in (55).

(55)   a.   ANAPHORIC $= \beta$

      b.   MOVEMENT $= \beta$ + COMPLEXITY + LENGTH + ISLAND VIOLATION

The length by complexity design allows the ISLAND VIOLATION cost to be isolated, but a dependency type design only allows the combination of COMPLEXITY, LENGTH, and ISLAND VIOLATION to be isolated from the baseline cost, as illustrated in (56).

(56)

$$
\begin{array}{rll}
 & \beta & \text{(ANAPHORIC)} \\
- & \beta + \text{COMPLEXITY} + \text{LENGTH} + \text{ISLAND VIOLATION} & \text{(MOVEMENT)} \\
\hline
= & -(\text{COMPLEXITY} + \text{LENGTH} + \text{ISLAND VIOLATION}) & \text{(Difference score)}
\end{array}
$$

Using the arithmetic in (56), a difference score can be calculated for different syntactic-semantic environments, as was done in Experiment 2. Crucially, though, drawing any conclusions about the strength of an island from the resulting difference scores requires assuming that the costs of COMPLEXITY and LENGTH remain stable across the environments studied. Whether this assumption is safe or not depends on how carefully length and complexity were controlled for in the construction of the items. However, even if the items are made carefully, the design still provides no way to truly isolate the ISLAND VIOLATION penalty, so whenever possible, it seems preferable to use the length by complexity design.

The only advantage that the dependency type design has over the length by complexity design is that it involves half the number of conditions, which means that fewer participants are needed. To study a single environment, only two conditions are needed;

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15.   Anaphoric dependencies like the one in (54a) are not syntactically mediated in the same way as movement dependencies, and I assume that as a result of this, the processing costs involved are negligible. A participant encountering the first DP *the president* in (54a) receives no cues that this DP will be referred to later with a pronoun, and so I assume there is less of a cost associated with identifying a potential tail for the anaphoric dependency. Furthermore, there are no DPs intervening between *the president* and the co-referent pronoun *him*, which I assume makes forming the dependency relatively effortless: the DP *the president* is the only discourse referent matching the features of the pronoun, and as the subject of the matrix clause, this discourse referent is likely to be highly salient and easy to associate with the pronoun *him*. In contrast, encountering the edge of the relative clause in (54b) kick-starts an "Active Filler Strategy" (Stowe 1986; Traxler and M. J. Pickering 1996, and others) because the movement dependency must be resolved in order for the sentence to have a grammatical parse. This strategy involves actively maintaining the head of the relative clause in memory and actively searching for a gap with which the head can be associated, all while continuously parsing the other material in the sentence. This strategy is inherently costly, as it requires more processing resources than processing an anaphoric dependency (consider, for example, Fiebach et al. 2001, and studies cited therein).

but to study a single environment in the length by complexity design, four conditions are needed. Since the dependency type design is less costly to run but is potentially less accurate for gauging island violation costs, the author suggests that it should only be used when the researcher's participant pool is limited in order to get a rough estimate that can later be precisified by a follow-up experiment using the length by complexity design. The relative advantages and disadvantages for each design are summarized in Table 9.

Table 9: Summary: Methodological comparison

	Advantages	Disadvantages
LENGTH BY COMPLEXITY DESIGN	Finer grained: allows island violation effect to be isolated from other effects	Costlier to run: twice as many conditions needed (more items, more participants)
DEPENDENCY TYPE DESIGN	Less costly to run: half the number of conditions needed	Coarser grained: variation in other costs can't be determined; requires riskier assumptions; less comparability across experiments

7 Conclusion

This paper has presented experimental evidence that suggests that English RCs are not always strong islands, contrary to what has often been assumed. These findings are noteworthy, since it was previously thought that only a small set of exceptional languages permit RC subextraction when certain conditions are met. It is becoming increasingly evident that such cases of RC subextraction might not be the exception, but the rule. Many of the languages that have been identified as permitting RC subextraction seem to allow it in similar syntactic environments: those in which the DP that hosts the RC does not carry a presupposition of existence. This is supported by the fact that the existential construction is one of the syntactic environments that facilitates RC subextraction in the languages discussed. It may be that other syntactic conditions need to be met for RC subextraction to occur, such as the RC being a raising RC (as argued for in Sichel 2018), but the presence of this factor is more challenging to diagnose, has received little focus in the literature on RC subextraction until recently, and has received less focus here.

Extraction from RCs in English has received less discussion than extraction from RCs on other languages, especially the Scandinavian languages, despite the fact that relatively early work pointed out apparent exceptions to the Complex NP Constraint in English (Chung and McCloskey 1983; Kuno 1976; McCawley 1981). Following Engdahl (1997), I would like to suggest that this is a consequence of certain properties of Scandinavian languages. Engdahl observes the following.

> It seems that the Scandinavian languages favour an utterance structure with fronted topics, contrastive as well as continuous topics. This means that part of learning these languages involves learning when to use a contrastive topic or a continuous topic and how to realise these, syntactically and prosodically.
>
> (1997, p. 34)

Although Engdahl suggests that learning how to realize contrastive or continuous topics affects the ease with which speakers can produce and interpret sentences with topics that have been fronted from within a relative clause, I suggest that the widespread use of topic fronting in Scandinavian languages provides more of an opportunity to observe acceptable cases of RC subextraction. Although the present study has identified acceptable cases of RC subextraction in English, RC subextraction in English will be observed in a smaller range of A-bar constructions, providing less of an opportunity to observe the phenomenon. If this is on the right track, this reaffirms the importance of looking at a wide variety of languages as we strive to develop a more universal theory of the grammar of natural language. Widely studied languages such as English may lack certain properties, and as a result may obscure certain facts that are more evident in other languages. Once certain facts have been identified in other languages, they may even shed light on languages that were previously thought not to exhibit a particular phenomenon, as was the case here.

The studies presented here inspire a number of future studies. As mentioned in §6, at least one future study might investigate what the source of the remaining super-additive interaction is in the syntactic environments that facilitate RC subextraction. It was suggested that this has to do with the memory decay that the highest filler phrase suffers, perhaps made worse by the need to parse a second movement dependency while maintining the initial filler phrase in memory. Future studies might modulate the strength of encoding of the higher filler phrase to observe whether the super-additive interaction increases when the encoding has a weaker representation and decreases when the encoding has a stronger representation. Another study might manipulate the features of both filler phrases to make them more or less distinct from each other to observe whether the super-additive interaction increases when the filler phrases are more likely to interfere in memory, or whether the super-additive interaction decreases when they are less likely to interfere in memory.

Separate from issues concerning the remaining super-additive interaction, a different kind of follow-up study concerns the real-time parsing of examples like those discussed above. Much research in psycholinguistics has found that the human parser is highly active and predictive, attempting to establish dependencies before all input is received. For filler-gap dependencies, this has been termed the Active Filler Strategy, but it has recently been given a more general name, Active Dependency Formation. A number of researchers have found that this strategy is dependent on the syntactic environment currently being parsed, such that the strategy is temporarily called off in syntactic environments (such as islands) in which the dependency could not be resolved grammatically (M. Pickering et al. 1994; Stowe 1986; Traxler and M. J. Pickering 1996), as evidenced by the lack of a "filled gap effect".[16]

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16. The filled gap effect is a phenomenon in which on-line measures such as reading time suggest that the

Since the current study uses an off-line measure (acceptability ratings) to claim that there are certain syntactic environments in which RCs can grammatically be extracted from in English, the inquiring mind wants to know whether there is any on-line evidence that individuals are willing to anticipate gaps in these environments. This investigation could plausibly be carried out with either a self-paced reading study or an eye-tracking while reading study. If we find the presence of a filled gap effect in such a study, this would provide confirmation for the hypothesis that these are grammatical RC subextractions, and it would also provide a noteworthy update to research on the on-line processing of A-bar dependencies.

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A   Supplemental material links

Supplemental materials for each experiment, including all R code used in the analysis of these experiments, can be found at the following URL:

(57)   https://jakewvincent.github.io/notebooks.html

B   Models

B.1   Experiment 1

A mixed effects analysis (with random effects for subjects and items) was performed in R using the `clmm()` function provided by the `Ordinal` package (Christensen 2018).

Table 10: Coefficients for Experiment 1 Mixed Effects Model

	β	SE	z	p	<0.05?
Definiteness	-0.7634	0.1757	-4.345	$1.39*10^{-05}$	✓
Structure	-1.9688	0.2523	-7.802	$6.10*10^{-15}$	✓
Length	-3.2657	0.3306	-9.877	$<2*10^{-16}$	✓
Definiteness × Structure	0.1490	0.4126	0.361	0.718	
Definiteness × Length	0.1955	0.3421	0.572	0.568	
Structure × Length	-2.2987	0.4679	-4.913	$8.97*10^{-07}$	✓
Definiteness × Structure × Length	-0.1072	0.6335	-0.169	0.866	

The contrasts for the DEFINITENESS factor were –0.5 and 0.5 for DEFINITE and INDEFINITE, respectively. The negative coefficient (β) for the DEFINITENESS effect indicates that definite DPs significantly improve ratings overall relative to indefinite DPs.

The contrasts for the STRUCTURE factor were –0.5 and 0.5 for NON-ISLAND and ISLAND, respectively. The significant effect of STRUCTURE has a negative coefficient, indicating that the presence of the NON-ISLAND structures significantly improve ratings relative to the ISLAND structures.

For the LENGTH factor, contrasts were set to –0.5 and 0.5 for SHORT and LONG, respectively, so the negative coefficient for LENGTH indicates that SHORT conditions were significantly better than LONG conditions.

STRUCTURE and LENGTH interact significantly, and the coefficient is negative. This indicates that long extraction from an island causes significant degradation to ratings relative to long extraction from a non-island.

B.2   Experiment 2

B.2.1   Simple effects analysis: Version 1

Helmert contrast coding was given to the SUBJECT factor, such that in the DEFINITENESS comparison, DEFINITE had a negative contrast value of –1 and INDEFINITE had a positive contrast value of 1. In the HEIGHT comparison, the combination of the high subject conditions was assigned a negative contrast value of –2, and the low subject condition was assigned a positive contrast value of 2. The HEIGHT comparison was found to be significant in the simple effects analysis, and the negative coefficient shown in Table 11

Table 11: Coefficients for Experiment 2 (Version 1) Simple Effects Model

	β	SE	z	p	<0.05?
DEFINITENESS	-0.09858	0.06776	-1.455	0.146	
HEIGHT	-0.35041	0.04064	-8.623	$<2*10^{-16}$	✓
Dependency type	-3.57022	0.15521	-23.003	$<2*10^{-16}$	✓
DEFINITENESS × Dependency type	0.03399	0.13550	0.251	0.802	
HEIGHT × Dependency type	0.35407	0.08091	4.376	$1.21*10^{-05}$	✓

indicates that the high subject conditions on the whole were significantly better than the low subject conditions, a pattern that is visible in Figure 4.

Within the DEPENDENCY TYPE factor, the ANAPHORIC level was assigned a negative contrast value of –0.5, and the MOVEMENT level was assigned a positive value of 0.5. The negative coefficient for the main effect of DEPENDENCY TYPE therefore indicates that the ANAPHORIC conditions received significantly better ratings than the MOVEMENT conditions, to no surprise.

The significant interaction of HEIGHT and Dependency type has a positive coefficient. This indicates that in the low subject conditions, ratings were significantly less degraded in the movement condition relative to the anaphoric condition compared to the high subject conditions.

B.2.2 Mixed effects analysis: Version 2 (Mechanical Turk)

Table 12: Coefficients for Experiment 2 (Version 2) Mixed Effects Model

	β	SE	z	p	<0.05?
DEFINITENESS	-0.035	0.122	-0.285	0.776	
HEIGHT	-0.424	0.070	-6.037	$1.57*10^{-09}$	✓
Dependency type	-4.530	0.463	-9.788	$<2*10^{-16}$	✓
DEFINITENESS × Dependency type	0.244	0.231	1.056	0.291	
HEIGHT × Dependency type	0.625	0.156	4.008	$6.11*10^{-05}$	✓

Although the coefficients have different values in this mixed effects model, their signs are the same, and the same effects are found to be significant, so the interpretation remains the same as the interpretation for the model in B.2.1.

B.3 Experiment 3

A mixed effects ordinal regression model with a maximal random effects structure was fitted to the data using the `clmm()` function provided by the `Ordinal` package (Christensen 2018) in `R` (R Core Team 2018). The ratings were set as the dependent measure, and the other factors and their interactions were set as fixed effects. The random effects structure included random intercepts for subjects and items, as well as random slopes by both subjects and items for all factors and their interactions.

```
Formula:
rating ~ context * ec_type * dep_length +
(1 + context * ec_type * dep_length | subject) +
(1 + context * ec_type * dep_length | item_set)
```

Table 13: Coefficients for Experiment 3 Mixed Effects Model

	β	SE	z	p	<0.05?
BE	-0.7346	0.1046	-7.03	$2.1*10^{-12}$	✓
TRANSITIVITY	-0.4327	0.0626	-6.92	$4.7*10^{-12}$	✓
Structure	0.7973	0.1411	5.65	$1.6*10^{-08}$	✓
Length	1.7243	0.2470	6.98	$2.9*10^{-12}$	✓
BE × Structure	-0.3824	0.1967	-1.94	0.052	
TRANSITIVITY × Structure	0.0966	0.1080	0.89	0.371	
BE × Length	-0.4487	0.1806	-2.49	0.013	✓
TRANSITIVITY × Length	-0.0781	0.0959	-0.81	0.415	
Structure × Length	-1.2935	0.2872	-4.50	$6.7*10^{-06}$	✓
BE × Structure × Length	0.2203	0.3764	0.59	0.558	
TRANSITIVITY × Structure × Length	-0.4544	0.2109	-2.15	0.031	✓

There were a number of significant main effects. BE, which was the comparison between PREDICATE (contrast value = 1) and EXISTENTIAL (contrast value = –1), received a negative coefficient, indicating that the EXISTENTIAL conditions were rated significantly higher than PREDICATE conditions.

TRANSITIVITY was also a significant main effect, which compared the OBJECT level (contrast value = 2) to the combination of the PREDICATE and EXISTENTIAL levels (contrast value = –2). The negative coefficient for indicates that the combination of PREDICATE and EXISTENTIAL had a significant positive effect on ratings compared to the OBJECT level.

There were also significant main effects of STRUCTURE and LENGTH. Structure received a positive coefficient, indicating that NON-ISLAND conditions (contrast value = 0.5) were significantly better than ISLAND conditions (contrast value = –0.5). LENGTH

also received a positive coefficient, indicating that SHORT conditions (contrast value = 0.5) were significantly better than LONG conditions (contrast value = –0.5).

Apart from the main effects, there were three significant interactions. The BE × Length interaction received a negative coefficient, indicating that in the EXISTENTIAL level, SHORT extractions were significantly better than in the PREDICATE level, but that the reverse is true when considering LONG extractions.

There was a significant interaction between STRUCTURE and LENGTH, which was given a negative coefficient. As in the model shown for Experiment 1 (Table 10), this indicates that when comparing NON-ISLAND and ISLAND conditions, the LONG extraction was rated significantly worse in the ISLAND conditions.

Finally, a significant three-way interaction was observed between TRANSITIVITY, STRUCTURE, and LENGTH. The coefficient provided by the analysis is negative. This indicates that there is a significant difference in the ratings for conditions involving extraction from islands, with the OBJECT conditions receiving more of a penalty, and the combination of PREDICATE and EXISTENTIAL conditions receiving less of a penalty.

C   Experiment 1: CP complements to N

In the CP complement items, non-island conditions, matrix verbs that select for CP complements were chosen that also have noun homophones (e.g. *worry*) that select for CP complements. In the island conditions, a separate matrix verb was chosen that could take the noun homophone as its complement. This created a length differential between the island and non-island conditions in the CP complement items that is evident in the sample item below.

(58)   SAMPLE ITEM: CP COMPLEMENT ISLAND (EXPERIMENT 1)

    a. Who worried that the builder didn't seal the windows?   SHORT | DEF | NON-ISLAND

    b. Who worried that a builder didn't seal the windows?   SHORT | IND | NON-ISLAND

    c. What did Steve worry that the builder didn't seal?   LONG | DEF | NON-ISLAND

    d. What did Steve worry that a builder didn't seal?   LONG | IND | NON-ISLAND

    e. Who expressed the worry that the builder didn't seal the windows?

        SHORT | DEF | ISLAND

    f. Who expressed a worry that the builder didn't seal the windows?

        SHORT | IND | ISLAND

    g. What did Steve express the worry that the builder didn't seal?   LONG | DEF | ISLAND

    h. What did Steve express a worry that the builder didn't seal?   LONG | IND | ISLAND

D   Items

D.1   Experiment 1

(59)   ITEM 1
  a.   Who noticed that the teacher wears a bowtie?   NON-ISLAND | SHORT | DEF
  b.   Who noticed that a teacher wears a bowtie?   NON-ISLAND | SHORT | IND
  c.   What did Delilah notice that the teacher wears?   NON-ISLAND | LONG | DEF
  d.   What did Delilah notice that a teacher wears?   NON-ISLAND | LONG | IND
  e.   Who noticed the teacher who wears a bowtie?   ISLAND | SHORT | DEF
  f.   Who noticed a teacher who wears a bowtie?   ISLAND | SHORT | IND
  g.   What did Delilah notice the teacher who wears?   ISLAND | LONG | DEF
  h.   What did Delilah notice a teacher who wears?   ISLAND | LONG | IND

(60)   ITEM 2
  a.   Who trusts that the senator cares about the constitution?   NON-ISLAND | SHORT | DEF
  b.   Who trusts that a senator cares about the constitution?   NON-ISLAND | SHORT | IND
  c.   What does Sarah trust that the senator cares about?   NON-ISLAND | LONG | DEF
  d.   What does Sarah trust that a senator cares about?   NON-ISLAND | LONG | IND
  e.   Who trusts the senator who cares about the constitution?   ISLAND | SHORT | DEF
  f.   Who trusts a senator who cares about the constitution?   ISLAND | SHORT | IND
  g.   What does Sarah trust the senator who cares about?   ISLAND | LONG | DEF
  h.   What does Sarah trust a senator who cares about?   ISLAND | LONG | IND

(61)   ITEM 3
  a.   Who respected that the citizens dislike being photographed?   NON-ISLAND | SHORT | DEF
  b.   Who respected that citizens dislike being photographed?   NON-ISLAND | SHORT | IND
  c.   What did Briana respect that the citizens dislike?   NON-ISLAND | LONG | DEF
  d.   What did Briana respect that citizens dislike?   NON-ISLAND | LONG | IND
  e.   Who respected the citizens who dislike being photographed?   ISLAND | SHORT | DEF
  f.   Who respected citizens who dislike being photographed?   ISLAND | SHORT | IND
  g.   What did Briana respect the citizens who dislike?   ISLAND | LONG | DEF
  h.   What did Briana respect citizens who dislike?   ISLAND | LONG | IND

(62)   ITEM 4
  a.   Who found that the newspaper reprinted false claims?   NON-ISLAND | SHORT | DEF
  b.   Who found that a newspaper reprinted false claims?   NON-ISLAND | SHORT | IND
  c.   What did Peter find that the newspaper reprinted?   NON-ISLAND | LONG | DEF
  d.   What did Peter find that a newspaper reprinted?   NON-ISLAND | LONG | IND
  e.   Who found the newspaper that reprinted false claims?   ISLAND | SHORT | DEF
  f.   Who found a newspaper that reprinted false claims?   ISLAND | SHORT | IND
  g.   What did Peter find the newspaper that reprinted?   ISLAND | LONG | DEF
  h.   What did Peter find a newspaper that reprinted?   ISLAND | LONG | IND

(63) ITEM 5

    a.   Who likes that the gardeners mow the lawn once a month?   NON-ISLAND | SHORT | DEF

    b.   Who likes that gardeners mow the lawn once a month?   NON-ISLAND | SHORT | IND

    c.   What does Fred like that the gardeners mow once a month?   NON-ISLAND | LONG | DEF

    d.   What does Fred like that gardeners mow once a month?   NON-ISLAND | LONG | IND

    e.   Who likes the gardeners who mow the lawn once a month?   ISLAND | SHORT | DEF

    f.   Who likes gardeners who mow the lawn once a month?   ISLAND | SHORT | IND

    g.   What does Fred like the gardeners who mow once a month?   ISLAND | LONG | DEF

    h.   What does Fred like gardeners who mow once a month?   ISLAND | LONG | IND

(64) ITEM 6

    a.   Who believes that the salesmen wash their car every weekend?   NON-ISLAND | SHORT | DEF

    b.   Who believes that salesmen wash their car every weekend?   NON-ISLAND | SHORT | IND

    c.   What does Daniel believe that the salesmen wash every weekend?   NON-ISLAND | LONG | DEF

    d.   What does Daniel believe that salesmen wash every weekend?   NON-ISLAND | LONG | IND

    e.   Who believes the salesmen who wash their car every weekend?   ISLAND | SHORT | DEF

    f.   Who believes salesmen who wash their car every weekend?   ISLAND | SHORT | IND

    g.   What does Daniel believe the salesmen who wash every weekend?   ISLAND | LONG | DEF

    h.   What does Daniel believe salesmen who wash every weekend?   ISLAND | LONG | IND

(65) ITEM 7

    a.   Who knew that the child plays chess in the park?   NON-ISLAND | SHORT | DEF

    b.   Who knew that a child plays chess in the park?   NON-ISLAND | SHORT | IND

    c.   What did Wendell know that the child plays in the park?   NON-ISLAND | LONG | DEF

    d.   What did Wendell know that a child plays in the park?   NON-ISLAND | LONG | IND

    e.   Who knew the child who plays chess in the park?   ISLAND | SHORT | DEF

    f.   Who knew a child who plays chess in the park?   ISLAND | SHORT | IND

    g.   What did Wendell know the child who plays in the park?   ISLAND | LONG | DEF

    h.   What did Wendell know a child who plays in the park?   ISLAND | LONG | IND

(66) ITEM 8

    a.   Who predicted that the lending crisis would trigger the recession?   NON-ISLAND | SHORT | DEF

    b.   Who predicted that a lending crisis would trigger the recession?   NON-ISLAND | SHORT | IND

    c.   What did Peter predict that the lending crisis would trigger?   NON-ISLAND | LONG | DEF

    d.   What did Peter predict that a lending crisis would trigger?   NON-ISLAND | LONG | IND

    e.   Who predicted the lending crisis that would trigger the recession?   ISLAND | SHORT | DEF

    f.   Who predicted a lending crisis that would trigger the recession?   ISLAND | SHORT | IND

    g.   What did Peter predict the lending crisis that would trigger?   ISLAND | LONG | DEF

    h.   What did Peter predict a lending crisis that would trigger?   ISLAND | LONG | IND

(67)   ITEM 9

    a.   Who understands that the teachers dislike unstapled papers?   NON-ISLAND | SHORT | DEF

    b.   Who understands that teachers dislike unstapled papers?   NON-ISLAND | SHORT | IND

    c.   What does Lorena understand that the teachers dislike?   NON-ISLAND | LONG | DEF

    d.   What does Lorena understand that teachers dislike?   NON-ISLAND | LONG | IND

    e.   Who understands the teachers who dislike unstapled papers?   ISLAND | SHORT | DEF

    f.   Who understands teachers who dislike unstapled papers?   ISLAND | SHORT | IND

    g.   What does Lorena understand the teachers who dislike?   ISLAND | LONG | DEF

    h.   What does Lorena understand teachers who dislike?   ISLAND | LONG | IND

(68)   ITEM 10

    a.   Who reported that the group had filed a lawsuit?   NON-ISLAND | SHORT | DEF

    b.   Who reported that a group had filed a lawsuit?   NON-ISLAND | SHORT | IND

    c.   What did Rebecca report that the group had filed?   NON-ISLAND | LONG | DEF

    d.   What did Rebecca report that a group had filed?   NON-ISLAND | LONG | IND

    e.   Who reported the group that filed a lawsuit?   ISLAND | SHORT | DEF

    f.   Who reported a group that filed a lawsuit?   ISLAND | SHORT | IND

    g.   What did Rebecca report the group who filed?   ISLAND | LONG | DEF

    h.   What did Rebecca report a group who filed?   ISLAND | LONG | IND

(69)   ITEM 11

    a.   Who remembers that the students asked everyone in town for donations?   NON-ISLAND | SHORT | DEF

    b.   Who remembers that students asked everyone in town for donations?   NON-ISLAND | SHORT | IND

    c.   What does Brian remember that the students asked everyone in town for?   NON-ISLAND | LONG | DEF

    d.   What does Brian remember that students asked everyone in town for?   NON-ISLAND | LONG | IND

    e.   Who remembers the students who asked everyone in town for donations?   ISLAND | SHORT | DEF

    f.   Who remembers students who asked everyone in town for donations?   ISLAND | SHORT | IND

    g.   What does Brian remember the students who asked everyone in town for?   ISLAND | LONG | DEF

    h.   What does Brian remember students who asked everyone in town for?   ISLAND | LONG | IND

(70)   ITEM 12

    a.   Who taught that the Americans started the war?   NON-ISLAND | SHORT | DEF

    b.   Who taught that Americans started the war?   NON-ISLAND | SHORT | IND

    c.   What did Amanda teach that the Americans started?   NON-ISLAND | LONG | DEF

    d.   What did Amanda teach that Americans started?   NON-ISLAND | LONG | IND

    e.   Who taught the Americans that started the war?   ISLAND | SHORT | DEF

    f.   Who taught Americans that started the war?   ISLAND | SHORT | IND

    g.   What did Amanda teach the Americans that started?   ISLAND | LONG | DEF

    h.   What did Amanda teach Americans that started?   ISLAND | LONG | IND

(71)   Item 13

    a.   Who wrote that the character in the book is afraid of open spaces?   NON-ISLAND | SHORT | DEF

    b.   Who wrote that a character in the book had a fear of open spaces?   NON-ISLAND | SHORT | IND

    c.   What did James write that the character in the book is afraid of?   NON-ISLAND | LONG | DEF

    d.   What did James write that a character in the book is afraid of?   NON-ISLAND | LONG | IND

    e.   Who wrote the character in the book who is afraid of open spaces?   ISLAND | SHORT | DEF

    f.   Who wrote a character in the book who is afraid of open spaces?   ISLAND | SHORT | IND

    g.   What did James write the character in the book who is afraid of?   ISLAND | LONG | DEF

    h.   What did James write a character in the book who is afraid of?   ISLAND | LONG | IND

(72)   Item 14

    a.   Who appreciated that the students finished the optional assignment?   NON-ISLAND | SHORT | DEF

    b.   Who appreciated that students finished the optional assignment?   NON-ISLAND | SHORT | IND

    c.   What did Patty appreciate that the students finished?   NON-ISLAND | LONG | DEF

    d.   What did Patty appreciate that students finished?   NON-ISLAND | LONG | IND

    e.   Who appreciated the students who finished the optional assignment?   ISLAND | SHORT | DEF

    f.   Who appreciated students who finished the optional assignment?   ISLAND | SHORT | IND

    g.   What did Patty appreciate the students who finished?   ISLAND | LONG | DEF

    h.   What did Patty appreciate students who finished?   ISLAND | LONG | IND

(73)   Item 15

    a.   Who revealed that the Uber driver became an election candidate?   NON-ISLAND | SHORT | DEF

    b.   Who revealed that an Uber driver became an election candidate?   NON-ISLAND | SHORT | IND

    c.   What did Stefan reveal that the Uber driver became?   NON-ISLAND | LONG | DEF

    d.   What did Stefan reveal that an Uber driver became?   NON-ISLAND | LONG | IND

    e.   Who revealed the Uber driver who became an election candidate?   ISLAND | SHORT | DEF

    f.   Who revealed an Uber driver who became an election candidate?   ISLAND | SHORT | IND

    g.   What did Stefan reveal the Uber driver who became?   ISLAND | LONG | DEF

    h.   What did Stefan reveal an Uber driver who became?   ISLAND | LONG | IND

(74)   Item 16

    a.   Who suggested that the artists used expired paint for the mural?   NON-ISLAND | SHORT | DEF

    b.   Who suggested that artists used expired paint for the mural?   NON-ISLAND | SHORT | IND

    c.   What did Janet suggest that the artists used for the mural?   NON-ISLAND | LONG | DEF

    d.   What did Janet suggest that artists used for the mural?   NON-ISLAND | LONG | IND

    e.   Who suggested the artists who used expired paint for the mural?   ISLAND | SHORT | DEF

    f.   Who suggested artists who used expired paint for the mural?   ISLAND | SHORT | IND

    g.   What did Janet suggest the artists who used for the mural?   ISLAND | LONG | DEF

    h.   What did Janet suggest artists who used for the mural?   ISLAND | LONG | IND

(75) ITEM 17

    a.   Who claimed that the university wants to hire Stanley?   NON-ISLAND | SHORT | DEF

    b.   Who claimed that a university wants to hire Stanley?   NON-ISLAND | SHORT | IND

    c.   Who did Salazar claim that the university wants to hire?   NON-ISLAND | LONG | DEF

    d.   Who did Salazar claim that a university wants to hire?   NON-ISLAND | LONG | IND

    e.   Who heard the claim that the university wants to hire Stanley?   ISLAND | SHORT | DEF

    f.   Who heard a claim that the university wants to hire Stanley?   ISLAND | SHORT | IND

    g.   Who did Salazar hear the claim that the university wants to hire?   ISLAND | LONG | DEF

    h.   Who did Salazar hear a claim that the university wants to hire?   ISLAND | LONG | IND

(76) ITEM 18

    a.   Who worried that the builder didn't seal the windows?   NON-ISLAND | SHORT | DEF

    b.   Who worried that a builder didn't seal the windows?   NON-ISLAND | SHORT | IND

    c.   What did Steve worry that the builder didn't seal?   NON-ISLAND | LONG | DEF

    d.   What did Steve worry that a builder didn't seal?   NON-ISLAND | LONG | IND

    e.   Who expressed the worry that the builder didn't seal the windows?   ISLAND | SHORT | DEF

    f.   Who expressed a worry that the builder didn't seal the windows?   ISLAND | SHORT | IND

    g.   What did Steve express the worry that the builder didn't seal?   ISLAND | LONG | DEF

    h.   What did Steve express a worry that the builder didn't seal?   ISLAND | LONG | IND

(77) ITEM 19

    a.   Who complained that the mechanic didn't inspect the brakes?   NON-ISLAND | SHORT | DEF

    b.   Who complained that a mechanic didn't inspect the brakes?   NON-ISLAND | SHORT | IND

    c.   What did Alicia complain that the mechanic didn't inspect?   NON-ISLAND | LONG | DEF

    d.   What did Alicia complain that a mechanic didn't inspect?   NON-ISLAND | LONG | IND

    e.   Who filed the complaint that the mechanic didn't inspect the brakes?   ISLAND | SHORT | DEF

    f.   Who filed a complaint that the mechanic didn't inspect the brakes?   ISLAND | SHORT | IND

    g.   What did Alicia file the complaint that the mechanic didn't inspect?   ISLAND | LONG | DEF

    h.   What did Alicia file a complaint that the mechanic didn't inspect?   ISLAND | LONG | IND

(78) ITEM 20

    a.   Who hinted that the lawyer hopes to delay the trial?   NON-ISLAND | SHORT | DEF

    b.   Who hinted that a lawyer hopes to delay the trial?   NON-ISLAND | SHORT | IND

    c.   What did Patty hint that the lawyer hopes to delay?   NON-ISLAND | LONG | DEF

    d.   What did Patty hint that a lawyer hopes to delay?   NON-ISLAND | LONG | IND

    e.   Who overheard the hint that the lawyer hopes to delay the trial?   ISLAND | SHORT | DEF

    f.   Who overheard a hint that the lawyer hopes to delay the trial?   ISLAND | SHORT | IND

    g.   What did Patty overhear the hint that the lawyer hopes to delay?   ISLAND | LONG | DEF

    h.   What did Patty overhear a hint that the lawyer hopes to delay?   ISLAND | LONG | IND

(79)   ITEM 21

    a.   Who argued that the new councilmember was supported by special interest groups?   NON-ISLAND | SHORT | DEF

    b.   Who argued that a new councilmember was supported by special interest groups?   NON-ISLAND | SHORT | IND

    c.   What did Vivian argue that the new councilmember was supported by?   NON-ISLAND | LONG | DEF

    d.   What did Vivian argue that a new councilmember was supported by?   NON-ISLAND | LONG | IND

    e.   Who made the argument that the new councilmember was supported by special interest groups?   ISLAND | SHORT | DEF

    f.   Who made an argument that the new councilmember was supported by special interest groups?   ISLAND | SHORT | IND

    g.   What did Vivian make the argument that the new councilmember was supported by?   ISLAND | LONG | DEF

    h.   What did Vivian make an argument that the new councilmember was supported by?   ISLAND | LONG | IND

(80)   ITEM 22

    a.   Who dreamed that the local bakery would start selling donuts?   NON-ISLAND | SHORT | DEF

    b.   Who dreamed that a local bakery would start selling donuts?   NON-ISLAND | SHORT | IND

    c.   What did Leah dream that the local bakery would start selling?   NON-ISLAND | LONG | DEF

    d.   What did Leah dream that a local bakery would start selling?   NON-ISLAND | LONG | IND

    e.   Who had the dream that the local bakery would start selling donuts?   ISLAND | SHORT | DEF

    f.   Who had a dream that the local bakery would start selling donuts?   ISLAND | SHORT | IND

    g.   What did Leah have the dream that the local bakery would start selling?   ISLAND | LONG | DEF

    h.   What did Leah have a dream that the local bakery would start selling?   ISLAND | LONG | IND

(81)   ITEM 23

    a.   Who requested that the employee undergo anger management counseling?   NON-ISLAND | SHORT | DEF

    b.   Who requested that an employee undergo anger management counseling?   NON-ISLAND | SHORT | IND

    c.   What did Hector request that the employee undergo?   NON-ISLAND | LONG | DEF

    d.   What did Hector request that an employee undergo?   NON-ISLAND | LONG | IND

    e.   Who resented the request that the employee undergo anger management counseling?   ISLAND | SHORT | DEF

    f.   Who resented a request that the employee undergo anger management counseling?   ISLAND | SHORT | IND

    g.   What did Hector resent the request that the employee undergo?   ISLAND | LONG | DEF

    h.   What did Hector resent a request that the employee undergo?   ISLAND | LONG | IND

(82)   ITEM 24

    a.   Who lied that the committee used up the surplus funds?   NON-ISLAND | SHORT | DEF

    b.   Who lied that a committee used up the surplus funds?   NON-ISLAND | SHORT | IND

    c.   What did Anton lie that the committee used up?   NON-ISLAND | LONG | DEF

    d.   What did Anton lie that a committee used up?   NON-ISLAND | LONG | IND

    e.   Who exposed the lie that the committee used up the surplus funds?   ISLAND | SHORT | DEF

    f.   Who exposed a lie that the committee used up the surplus funds?   ISLAND | SHORT | IND

    g.   What did Anton expose the lie that the committee used up?   ISLAND | LONG | DEF

    h.   What did Anton expose a lie that the committee used up?   ISLAND | LONG | IND

(83)   ITEM 25

    a.   Who confessed that the rival team planned to sabotage the event?   NON-ISLAND | SHORT | DEF

    b.   Who confessed that a rival team planned to sabotage the event?   NON-ISLAND | SHORT | IND

    c.   What did Paul confess that the rival team planned to sabotage?   NON-ISLAND | LONG | DEF

    d.   What did Paul confess that a rival team planned to sabotage?   NON-ISLAND | LONG | IND

    e.   Who recorded the confession that the rival team planned to sabotage the event?   ISLAND | SHORT | DEF

    f.   Who recorded a confession that the rival team planned to sabotage the event?   ISLAND | SHORT | IND

    g.   What did Paul record the confession that the rival team planned to sabotage?   ISLAND | LONG | DEF

    h.   What did Paul record a confession that the rival team planned to sabotage?   ISLAND | LONG | IND

(84)   ITEM 26

    a.   Who suggested that the book could inspire the practice of witchcraft?   NON-ISLAND | SHORT | DEF

    b.   Who suggested that a book could inspire the practice of witchcraft?   NON-ISLAND | SHORT | IND

    c.   What did Sonya suggest that the book could inspire?   NON-ISLAND | LONG | DEF

    d.   What did Sonya suggest that a book could inspire?   NON-ISLAND | LONG | IND

    e.   Who challenged the suggestion that the book could inspire the practice of witchcraft?   ISLAND | SHORT | DEF

    f.   Who challenged a suggestion that the book could inspire the practice of witchcraft?   ISLAND | SHORT | IND

    g.   What did Sonya challenge the suggestion that the book could inspire?   ISLAND | LONG | DEF

    h.   What did Sonya challenge a suggestion that the book could inspire?   ISLAND | LONG | IND

(85)   ITEM 27

    a.   Who speculated that the group would discover alien life?   NON-ISLAND | SHORT | DEF

    b.   Who speculated that a group would discover alien life?   NON-ISLAND | SHORT | IND

    c.   What did Steven speculate that the group would discover?   NON-ISLAND | LONG | DEF

    d.   What did Steven speculate that a team would discover?   NON-ISLAND | LONG | IND

    e.   Who supported the speculation that the group would discover alien life?   ISLAND | SHORT | DEF

    f.   Who supported a speculation that the group would discover alien life?   ISLAND | SHORT | IND

    g.   What did Steven support the speculation that the group would discover?   ISLAND | LONG | DEF

    h.   What did Steven support a speculation that the group would discover?   ISLAND | LONG | IND

(86)   ITEM 28

    a.   Who warned that the government would take over the union?   NON-ISLAND | SHORT | DEF

    b.   Who warned that a government would take over the union?   NON-ISLAND | SHORT | IND

    c.   What did Amelia warn that the government would take over?   NON-ISLAND | LONG | DEF

    d.   What did Amelia warn that a government would take over?   NON-ISLAND | LONG | IND

    e.   Who sounded the warning that the government would take over the union?   ISLAND | SHORT | DEF

    f.   Who sounded a warning that the government would take over the union?   ISLAND | SHORT | IND

    g.   What did Amelia sound the warning that the government would take over?   ISLAND | LONG | DEF

    h.   What did Amelia sound a warning that the government would take over?   ISLAND | LONG | IND

(87)   ITEM 29

    a.   Who threatened that the county worker could condemn the property?   NON-ISLAND | SHORT | DEF

    b.   Who threatened that a county worker could condemn the property?   NON-ISLAND | SHORT | IND

    c.   What did Bobby threaten that the country worker could condemn?   NON-ISLAND | LONG | DEF

    d.   What did Bobby threaten that a county worker could condemn?   NON-ISLAND | LONG | IND

    e.   Who issued the threat that the county worker could condemn the property?   ISLAND | SHORT | DEF

    f.   Who issued a threat that the county worker could condemn the property?   ISLAND | SHORT | IND

    g.   What did Bobby issue the threat that the county worker could condemn?   ISLAND | LONG | DEF

    h.   What did Bobby issue a threat that the county worker could condemn?   ISLAND | LONG | IND

(88)   ITEM 30

    a.   Who guaranteed that the news story would reveal the president's secrets?   NON-ISLAND | SHORT | DEF

    b.   Who guaranteed that a news story would reveal the president's secrets?   NON-ISLAND | SHORT | IND

    c.   What did Marissa guarantee that the news story would reveal?   NON-ISLAND | LONG | DEF

    d.   What did Marissa guarantee that a news story would reveal?   NON-ISLAND | LONG | IND

    e.   Who repeated the guarantee that the news story would reveal the president's secrets?   ISLAND | SHORT | DEF

    f.   Who repeated a guarantee that the news story would reveal the president's secrets?   ISLAND | SHORT | IND

    g.   What did Marissa repeat the guarantee that the news story would reveal?   ISLAND | LONG | DEF

    h.   What did Marissa repeat a guarantee that the news story would reveal?   ISLAND | LONG | IND

(89)   ITEM 31

    a.   Who felt that the company shouldn't oversee its employees' to-do lists?   NON-ISLAND | SHORT | DEF

    b.   Who felt that a company shouldn't oversee its employees' to-do lists?   NON-ISLAND | SHORT | IND

    c.   What did Joshua feel that the company shouldn't oversee?   NON-ISLAND | LONG | DEF

    d.   What did Joshua feel that a company shouldn't oversee?   NON-ISLAND | LONG | IND

    e.   Who conveyed the feeling that the company shouldn't oversee its employees' to-do lists?   ISLAND | SHORT | DEF

    f.   Who conveyed a feeling that the company shouldn't oversee its employees' to-do lists?   ISLAND | SHORT | IND

    g.   What did Joshua convey the feeling that the company shouldn't oversee?   ISLAND | LONG | DEF

    h.   What did Joshua convey a feelings that the company shouldn't oversee?   ISLAND | LONG | IND

(90)   ITEM 32

    a.   Who demanded that the museum withdraw its offer?   NON-ISLAND | SHORT | DEF

    b.   Who demanded that a museum withdraw its offer?   NON-ISLAND | SHORT | IND

    c.   What did Shelley demand that the museum withdraw?   NON-ISLAND | LONG | DEF

    d.   What did Shelley demand that a museum withdraw?   NON-ISLAND | LONG | IND

    e.   Who mocked the demand that the museum withdraw its offer?   ISLAND | SHORT | DEF

    f.   Who mocked a demand that the museum withdraw its offer?   ISLAND | SHORT | IND

    g.   What did Shelley mock the demand that the museum withdraw?   ISLAND | LONG | DEF

    h.   What did Shelley mock a demand that the museum withdraw?   ISLAND | LONG | IND

D.2   Experiment 2

(91)   ITEM 1

    a.   The president is someone that there are many Americans who supported in the election living in rural areas.

<div align="right">THERE | MOVEMENT</div>

    b.   The president thinks that there are many Americans who supported him in the election living in rural areas.

<div align="right">THERE | ANAPHORIC</div>

    c.   The president is someone that many Americans who supported in the election are living in rural areas.

<div align="right">INDEFINITE | MOVEMENT</div>

    d.   The president thinks that many Americans who supported him in the election are living in rural areas.

<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   The president is someone that the Americans who supported in the election are living in rural areas.

<div align="right">DEFINITE | MOVEMENT</div>

    f.   The president thinks that the Americans who supported him in the election are living in rural areas.

<div align="right">DEFINITE | ANAPHORIC</div>

(92)   ITEM 2

    a.   The Rock is someone that there are two producers who fired from their movie reaching out to other actors.

<div align="right">THERE | MOVEMENT</div>

    b.   The Rock knows that there are two producers who fired him from their movie reaching out to other actors.

<div align="right">THERE | ANAPHORIC</div>

    c.   The Rock is someone that two producers who fired from their movie are reaching out to other actors.

<div align="right">INDEFINITE | MOVEMENT</div>

    d.   The Rock knows that two producers who fired him from their movie are reaching out to other actors.

<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   The Rock is someone that the producers who fired from their movie are reaching out to other actors.

<div align="right">DEFINITE | MOVEMENT</div>

    f.   The Rock knows that the producers who fired him from their movie are reaching out to other actors.

<div align="right">DEFINITE | ANAPHORIC</div>

(93)   ITEM 3

    a.   The vice president is someone that there are many people who follow on social media disagreeing with Republicans.

<div align="right">THERE | MOVEMENT</div>

    b.   The vice president says that there are many people who follow him on social media disagreeing with Republicans.

<div align="right">THERE | ANAPHORIC</div>

    c.   The vice president is someone that many people who follow on social media are disagreeing with Republicans.

<div align="right">INDEFINITE | MOVEMENT</div>

    d.   The vice president says that many people who follow him on social media are disagreeing with Republicans.

<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   The vice president is someone that the people who follow on social media are disagreeing with Republicans.

<div align="right">DEFINITE | MOVEMENT</div>

    f.   The vice president says that the people who follow him on social media are disagreeing with Republicans.

<div align="right">DEFINITE | ANAPHORIC</div>

(94)   ITEM 4

    a.   The queen is someone that there are some citizens who trust completely listening to the news.   THERE | MOVEMENT

    b.   The queen believes that there are some citizens who trust her completely listening to the news.   THERE | ANAPHORIC

    c.   The queen is someone that some citizens who trust completely are listening to the news.   INDEFINITE | MOVEMENT

    d.   The queen believes that some citizens who trust her completely are listening to the news.   INDEFINITE | ANAPHORIC

    e.   The queen is someone that the citizens who trust completely are listening to the news.   DEFINITE | MOVEMENT

    f.   The queen believes that the citizens who trust her completely are listening to the news.   DEFINITE | ANAPHORIC

(95) ITEM 5

    a. The first lady is someone that there are several reporters who meet during press events writing biographies.

<div align="right">THERE | MOVEMENT</div>

    b. The first lady claims that there are several reporters who meet her during press events writing biographies.

<div align="right">THERE | ANAPHORIC</div>

    c. The first lady is someone that several reporters who meet during press events are writing biographies.

<div align="right">INDEFINITE | MOVEMENT</div>

    d. The first lady claims that several reporters who meet her during press events are writing biographies.

<div align="right">INDEFINITE | ANAPHORIC</div>

    e. The first lady is someone that the reporters who meet during press events are writing biographies.

<div align="right">DEFINITE | MOVEMENT</div>

    f. The first lady claims that the reporters who meet her during press events are writing biographies.

<div align="right">DEFINITE | ANAPHORIC</div>

(96) ITEM 6

    a. The pope is someone that there are countless worshippers who appreciate for all kinds of reasons attending church.

<div align="right">THERE | MOVEMENT</div>

    b. The pope hopes that there are countless worshippers who appreciate him for all kinds of reasons attending church.

<div align="right">THERE | ANAPHORIC</div>

    c. The pope is someone that countless worshippers who appreciate for all kinds of reasons are attending church.

<div align="right">INDEFINITE | MOVEMENT</div>

    d. The pope hopes that countless worshippers who appreciate him for all kinds of reasons are attending church.

<div align="right">INDEFINITE | ANAPHORIC</div>

    e. The pope is someone that the worshippers who appreciate for all kinds of reasons are attending church.

<div align="right">DEFINITE | MOVEMENT</div>

    f. The pope hopes that the worshippers who appreciate him for all kinds of reasons are attending church.

<div align="right">DEFINITE | ANAPHORIC</div>

(97) ITEM 7

    a. The governor is someone that there are two staffers who accompany on trips working on the schedule.

<div align="right">THERE | MOVEMENT</div>

    b. The governor says that there are two staffers who accompany him on trips working on the schedule.

<div align="right">THERE | ANAPHORIC</div>

    c. The governor is someone that two staffers who accompany on trips are working on the schedule.

<div align="right">INDEFINITE | MOVEMENT</div>

    d. The governor says that two staffers who accompany him on trips are working on the schedule.

<div align="right">INDEFINITE | ANAPHORIC</div>

    e. The governor is someone that the staffers who accompany on trips are working on the schedule.   DEFINITE | MOVEMENT

    f. The governor says that the staffers who accompany him on trips are working on the schedule.   DEFINITE | ANAPHORIC

(98) ITEM 8

    a. The Supreme Court is something that there are many experts who supported last year pushing for reform.

<div align="right">THERE | MOVEMENT</div>

    b. The Supreme Court hopes that there are many experts who supported them last year pushing for reform.

<div align="right">THERE | ANAPHORIC</div>

    c. The Supreme Court is something that many experts who supported last year are pushing for reform.

<div align="right">INDEFINITE | MOVEMENT</div>

    d. The Supreme Court hopes that many experts who supported them last year are pushing for reform.

<div align="right">INDEFINITE | ANAPHORIC</div>

    e. The Supreme Court is something that the experts who supported last year are pushing for reform.

<div align="right">DEFINITE | MOVEMENT</div>

    f. The Supreme Court hopes that the experts who supported them last year are pushing for reform.

<div align="right">DEFINITE | ANAPHORIC</div>

(99)   ITEM 9

a.   The Dalai Lama is someone that there are some Americans who saw in 2014 venturing into Buddhism.

THERE | MOVEMENT

b.   The Dalai Lama thinks that there are some Americans who saw him in 2014 venturing into Buddhism.

THERE | ANAPHORIC

c.   The Dalai Lama is someone that some Americans who saw in 2014 are venturing into Buddhism.

INDEFINITE | MOVEMENT

d.   The Dalai Lama thinks that some Americans who saw him in 2014 are venturing into Buddhism.

INDEFINITE | ANAPHORIC

e.   The Dalai Lama is someone that the Americans who saw in 2014 are venturing into Buddhism.   DEFINITE | MOVEMENT

f.   The Dalai Lama thinks that the Americans who saw him in 2014 are venturing into Buddhism.   DEFINITE | ANAPHORIC

(100)   ITEM 10

a.   Barack Obama is someone that there are numerous children who admired in 2008 getting involved in politics.

THERE | MOVEMENT

b.   Barack Obama believes that there are numerous children who admired him in 2008 getting involved in politics.

THERE | ANAPHORIC

c.   Barack Obama is someone that numerous children who admired in 2008 are getting involved in politics.

INDEFINITE | MOVEMENT

d.   Barack Obama believes that numerous children who admired him in 2008 are getting involved in politics.

INDEFINITE | ANAPHORIC

e.   Barack Obama is someone that the children who admired in 2008 are getting involved in politics.

DEFINITE | MOVEMENT

f.   Barack Obama believes that the children who admired him in 2008 are getting involved in politics.

DEFINITE | ANAPHORIC

(101)   ITEM 11

a.   Beyoncé is someone that there are many listeners who saw at the Super Bowl listening to other artists.

THERE | MOVEMENT

b.   Beyoncé knows that there are many listeners who saw her at the Super Bowl listening to other artists.

THERE | ANAPHORIC

c.   Beyoncé is someone that many listeners who saw at the Super Bowl are listening to other artists.

INDEFINITE | MOVEMENT

d.   Beyoncé knows that many listeners who saw her at the Super Bowl are listening to other artists.

INDEFINITE | ANAPHORIC

e.   Beyoncé is someone that the listeners who saw at the Super Bowl are listening to other artists.   DEFINITE | MOVEMENT

f.   Beyoncé knows that the listeners who saw her at the Super Bowl are listening to other artists.   DEFINITE | ANAPHORIC

(102)   ITEM 12

a.   Bernie Sanders is someone that there are several actors who endorsed in the elections starring in major movies.

THERE | MOVEMENT

b.   Bernie Sanders says that there are several actors who endorsed him in the elections starring in major movies.

THERE | ANAPHORIC

c.   Bernie Sanders is someone that several actors who endorsed in the elections are starring in major movies.

INDEFINITE | MOVEMENT

d.   Bernie Sanders says that several actors who endorsed him in the elections are starring in major movies.

INDEFINITE | ANAPHORIC

e.   Bernie Sanders is someone that the actors who endorsed in the elections are starring in major movies.

DEFINITE | MOVEMENT

f.   Bernie Sanders says that the actors who endorsed him in the elections are starring in major movies.

DEFINITE | ANAPHORIC

(103)   ITEM 13

    a.   Oprah Winfrey is someone that there are multiple people who criticized for no good reason falling into bankruptcy.
                THERE | MOVEMENT

    b.   Oprah Winfrey believes that there are multiple people who criticized her for no good reason falling into bankruptcy.
                THERE | ANAPHORIC

    c.   Oprah Winfrey is someone that multiple people who criticized for no good reason are falling into bankruptcy.
                INDEFINITE | MOVEMENT

    d.   Oprah Winfrey believes that multiple people who criticized her for no good reason are falling into bankruptcy.
                INDEFINITE | ANAPHORIC

    e.   Oprah Winfrey is someone that the people who criticized for no good reason are falling into bankruptcy.
                DEFINITE | MOVEMENT

    f.   Oprah Winfrey believes that the people who criticized her for no good reason are falling into bankruptcy.
                DEFINITE | ANAPHORIC

(104)   ITEM 14

    a.   J.K. Rowling is someone that there are some writers who attack each year blogging about Harry Potter.
                THERE | MOVEMENT

    b.   J.K. Rowling claims that there are some writers who attack her each year blogging about Harry Potter.
                THERE | ANAPHORIC

    c.   J.K. Rowling is someone that some writers who attack each year are blogging about Harry Potter.
                INDEFINITE | MOVEMENT

    d.   J.K. Rowling claims that some writers who attack her each year are blogging about Harry Potter.
                INDEFINITE | ANAPHORIC

    e.   J.K. Rowling is someone that the writers who attack each year are blogging about Harry Potter.   DEFINITE | MOVEMENT

    f.   J.K. Rowling claims that the writers who attack her each year are blogging about Harry Potter.   DEFINITE | ANAPHORIC

(105)   ITEM 15

    a.   Bruno Mars is someone that there are many artists who appreciate enthusiastically working on new albums.
                THERE | MOVEMENT

    b.   Bruno Mars knows that there are many artists who appreciate him enthusiastically working on new albums.
                THERE | ANAPHORIC

    c.   Bruno Mars is someone that many artists who appreciate enthusiastically are working on new albums.
                INDEFINITE | MOVEMENT

    d.   Bruno Mars knows that many artists who appreciate him enthusiastically are working on new albums.
                INDEFINITE | ANAPHORIC

    e.   Bruno Mars is someone that the artists who appreciate enthusiastically are working on new albums.
                DEFINITE | MOVEMENT

    f.   Bruno Mars knows that the artists who appreciate him enthusiastically are working on new albums.
                DEFINITE | ANAPHORIC

(106)   ITEM 16

    a.   Hillary Clinton is someone that there are some people who adored last year focusing on local elections.
                THERE | MOVEMENT

    b.   Hillary Clinton thinks that there are some people who adored her last year focusing on local elections.
                THERE | ANAPHORIC

    c.   Hillary Clinton is someone that some people who adored last year are focusing on local elections.
                INDEFINITE | MOVEMENT

    d.   Hillary Clinton thinks that some people who adored her last year are focusing on local elections.
                INDEFINITE | ANAPHORIC

    e.   Hillary Clinton is someone that the people who adored last year are focusing on local elections.
                DEFINITE | MOVEMENT

    f.   Hillary Clinton thinks that the people who adored her last year are focusing on local elections.   DEFINITE | ANAPHORIC

(107) ITEM 17

    a.   Leonardo DiCaprio is someone that there are three pool players who beat in a competition picking up new hobbies.
<div align="right">THERE | MOVEMENT</div>

    b.   Leonardo DiCaprio hopes that there are three pool players who beat him in a competition picking up new hobbies.
<div align="right">THERE | ANAPHORIC</div>

    c.   Leonardo DiCaprio is someone that three pool players who beat in a competition are picking up new hobbies.
<div align="right">INDEFINITE | MOVEMENT</div>

    d.   Leonardo DiCaprio hopes that three pool players who beat him in a competition are picking up new hobbies.
<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   Leonardo DiCaprio is someone that the pool players who beat in a competition are picking up new hobbies.
<div align="right">DEFINITE | MOVEMENT</div>

    f.   Leonardo DiCaprio hopes that the pool players who beat him in a competition are picking up new hobbies.
<div align="right">DEFINITE | ANAPHORIC</div>

(108) ITEM 18

    a.   Stephen Hawking is someone that there are some scientists who know from college expanding on theories of physics.
<div align="right">THERE | MOVEMENT</div>

    b.   Stephen Hawking claims that there are some scientists who know him from college expanding on theories of physics.
<div align="right">THERE | ANAPHORIC</div>

    c.   Stephen Hawking is someone that some scientists who know from college are expanding on theories of physics.
<div align="right">INDEFINITE | MOVEMENT</div>

    d.   Stephen Hawking claims that some scientists who know him from college are expanding on theories of physics.
<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   Stephen Hawking is someone that the scientists who know from college are expanding on theories of physics.
<div align="right">DEFINITE | MOVEMENT</div>

    f.   Stephen Hawking claims that the scientists who know him from college are expanding on theories of physics.
<div align="right">DEFINITE | ANAPHORIC</div>

(109) ITEM 19

    a.   Janet Jackson is someone that there are several dancers who admire in some way appearing on TV shows.
<div align="right">THERE | MOVEMENT</div>

    b.   Janet Jackson hopes that there are several dancers who admire her in some way appearing on TV shows.
<div align="right">THERE | ANAPHORIC</div>

    c.   Janet Jackson is someone that several dancers who admire in some way are appearing on TV shows.
<div align="right">INDEFINITE | MOVEMENT</div>

    d.   Janet Jackson hopes that several dancers who admire her in some way are appearing on TV shows.
<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   Janet Jackson is someone that the dancers who admire in some way are appearing on TV shows.
<div align="right">DEFINITE | MOVEMENT</div>

    f.   Janet Jackson hopes that the dancers who admire her in some way are appearing on TV shows.
<div align="right">DEFINITE | ANAPHORIC</div>

(110) ITEM 20

    a.   Vladimir Putin is someone that there are numerous journalists who met last year writing new books.
<div align="right">THERE | MOVEMENT</div>

    b.   Vladimir Putin knows that there are several journalists who met him last year writing new books.
<div align="right">THERE | ANAPHORIC</div>

    c.   Vladimir Putin is someone that several journalists who met last year are writing new books.   INDEFINITE | MOVEMENT

    d.   Vladimir Putin knows that several journalists who met him last year are writing new books.   INDEFINITE | ANAPHORIC

    e.   Vladimir Putin is someone that the journalists who met last year are writing new books.   DEFINITE | MOVEMENT

    f.   Vladimir Putin knows that the journalists who met him last year are writing new books.   DEFINITE | ANAPHORIC

(111) ITEM 21

    a.   Ruth Bader Ginsburg is someone that there are countless people who respect very much building on previous lawsuits.
<div align="right">THERE | MOVEMENT</div>

    b.   Ruth Bader Ginsburg thinks that there are countless people who respect her very much building on previous lawsuits.
<div align="right">THERE | ANAPHORIC</div>

    c.   Ruth Bader Ginsburg is someone that countless people who respect very much are building on previous lawsuits.
<div align="right">INDEFINITE | MOVEMENT</div>

    d.   Ruth Bader Ginsburg thinks that countless people who respect her very much are building on previous lawsuits.
<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   Ruth Bader Ginsburg is someone that the people who respect very much are building on previous lawsuits.
<div align="right">DEFINITE | MOVEMENT</div>

    f.   Ruth Bader Ginsburg thinks that the people who respect her very much are building on previous lawsuits.
<div align="right">DEFINITE | ANAPHORIC</div>

(112) ITEM 22

    a.   Bill Gates is someone that there are several senators who appreciate for being honest learning about foreign hackers.
<div align="right">THERE | MOVEMENT</div>

    b.   Bill Gates says that there are several senators who appreciate him for being honest learning about foreign hackers.
<div align="right">THERE | ANAPHORIC</div>

    c.   Bill Gates is someone that several senators who appreciate for being honest are learning about foreign hackers.
<div align="right">INDEFINITE | MOVEMENT</div>

    d.   Bill Gates says that several senators who appreciate him for being honest are learning about foreign hackers.
<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   Bill Gates is someone that the senators who appreciate for being honest are learning about foreign hackers.
<div align="right">DEFINITE | MOVEMENT</div>

    f.   Bill Gates says that the senators who appreciate him for being honest are learning about foreign hackers.
<div align="right">DEFINITE | ANAPHORIC</div>

(113) ITEM 23

    a.   Lady Gaga is someone that there are many admirers who add on Facebook thinking of new fashion statements.
<div align="right">THERE | MOVEMENT</div>

    b.   Lady Gaga believes that there are many admirers who add her on Facebook thinking of new fashion statements.
<div align="right">THERE | ANAPHORIC</div>

    c.   Lady Gaga is someone that many admirers who add on Facebook are thinking of new fashion statements.
<div align="right">INDEFINITE | MOVEMENT</div>

    d.   Lady Gaga believes that many admirers who add her on Facebook are thinking of new fashion statements.
<div align="right">INDEFINITE | ANAPHORIC</div>

    e.   Lady Gaga is someone that the admirers who add on Facebook are thinking of new fashion statements.
<div align="right">DEFINITE | MOVEMENT</div>

    f.   Lady Gaga believes that the admirers who add her on Facebook are thinking of new fashion statements.
<div align="right">DEFINITE | ANAPHORIC</div>

(114) ITEM 24

a.	The Grinch is someone that there are two women who liked long ago hoping for peace.	THERE | MOVEMENT
b.	The Grinch claims that there are two women who liked him long ago hoping for peace.	THERE | ANAPHORIC
c.	The Grinch is someone that two women who liked long ago are hoping for peace.	INDEFINITE | MOVEMENT
d.	The Grinch claims that two women who liked him long ago are hoping for peace.	INDEFINITE | ANAPHORIC
e.	The Grinch is someone that the women who liked long ago are hoping for peace.	DEFINITE | MOVEMENT
f.	The Grinch claims that the women who liked him long ago are hoping for peace.	DEFINITE | ANAPHORIC

D.3 Experiment 3

(115) ITEM 1

a.	Which show do you think that Mary claims that she is the only senator who watches?	PREDICATE	ISLAND	LONG
b.	Who thinks that Mary claims that she is the only senator who watches this show?	PREDICATE	ISLAND	SHORT
c.	Which show do you think that Mary claims that only one senator watches?	PREDICATE	NON-ISLAND	LONG
d.	Who thinks that Mary claims that only one senator watches this show?	PREDICATE	NON-ISLAND	SHORT
e.	Which show do you think that there is only one senator who watches?	EXISTENTIAL	ISLAND	LONG
f.	Who thinks that there is only one senator who watches this show?	EXISTENTIAL	ISLAND	SHORT
g.	Which show do you think that there is only one senator watching?	EXISTENTIAL	NON-ISLAND	LONG
h.	Who thinks that there is only one senator watching this show?	EXISTENTIAL	NON-ISLAND	SHORT
i.	Which show do you think that Mary heard the only senator who watches?	OBJECT	ISLAND	LONG
j.	Who thinks that Mary heard the only senator who watches this show?	OBJECT	ISLAND	SHORT
k.	Which show do you think that Mary heard that only one senator watches?	OBJECT	NON-ISLAND	LONG
l.	Who thinks that Mary heard that only one senator watches this show?	OBJECT	NON-ISLAND	SHORT

(116) ITEM 2

a.	Which article did you say that Michael thinks that he is the only journalist who read?	PREDICATE	ISLAND	LONG
b.	Who said that Michael thinks that he is the only journalist who read this article?	PREDICATE	ISLAND	SHORT
c.	Which article did you say that Michael thinks that only one journalist read?	PREDICATE	NON-ISLAND	LONG
d.	Who said that Michael thinks that only one journalist read this article?	PREDICATE	NON-ISLAND	SHORT
e.	Which article did you say that there is only one journalist who read?	EXISTENTIAL	ISLAND	LONG
f.	Who said that there is only one journalist who read this article?	EXISTENTIAL	ISLAND	SHORT
g.	Which article did you say that there was only one senator reading?	EXISTENTIAL	NON-ISLAND	LONG
h.	Who said that there was only one senator reading this article?	EXISTENTIAL	NON-ISLAND	SHORT
i.	Which article did you say that Michael remembered the only journalist who read?	OBJECT	ISLAND	LONG
j.	Who said that Michael remembered the only journalist who read this article?	OBJECT	ISLAND	SHORT
k.	Which article did you say that Michael remembered that only one journalist read?	OBJECT	NON-ISLAND	LONG
l.	Who said that Michael remembered that only one journalist read this article?	OBJECT	NON-ISLAND	SHORT

(117) ITEM 3

a.	Which new library do you believe that Janine said that she is the only architect who designed?	PREDICATE	ISLAND	LONG
b.	Who believes that Janine said that she is the only architect who designed the new library?	PREDICATE	ISLAND	SHORT
c.	Which new library do you believe that Janine said that only one architect designed?	PREDICATE	NON-ISLAND	LONG
d.	Who believes that Janine said that only one architect designed the new library?	PREDICATE	NON-ISLAND	SHORT
e.	Which new library do you believe that there is only one architect who designed?	EXISTENTIAL	ISLAND	LONG
f.	Who believes that there is only one architect who designed the new library?	EXISTENTIAL	ISLAND	SHORT
g.	Which new library do you believe that there is only one architect designing?	EXISTENTIAL	NON-ISLAND	LONG
h.	Who believes that there is only one architect designing the new library?	EXISTENTIAL	NON-ISLAND	SHORT
i.	Which new library do you believe that Janine noticed the only architect who designed?	OBJECT	ISLAND	LONG
j.	Who believes that Janine noticed the only architect who designed the new library?	OBJECT	ISLAND	SHORT
k.	Which new library do you believe that Janine noticed that only one architect designed?	OBJECT	NON-ISLAND	LONG
l.	Who believes that Janine noticed that only one architect designed the new library?	OBJECT	NON-ISLAND	SHORT

(118)   ITEM 4

    a.   Which car do you hope that Ben said that he is the only family-member who drove?   PREDICATE | ISLAND | LONG

    b.   Who hopes that Ben said that he is the only family-member who drove your car?   PREDICATE | ISLAND | SHORT

    c.   Which car do you hope that Ben said that only one family-member drove?   PREDICATE | NON-ISLAND | LONG

    d.   Who hopes that Ben said that only one family-member drove your car?   PREDICATE | NON-ISLAND | SHORT

    e.   Which car do you hope that there is only one family-member who drove?   EXISTENTIAL | ISLAND | LONG

    f.   Who hopes that there is only one family-member who drove your car?   EXISTENTIAL | ISLAND | SHORT

    g.   Which car do you hope that there is only one family-member driving?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who hopes that there is only one family-member driving your car?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which car do you hope that Ben recognized the only family-member who drove?   OBJECT | ISLAND | LONG

    j.   Who hopes that Ben recognized the only family-member who drove your car?   OBJECT | ISLAND | SHORT

    k.   Which car do you hope that Ben recognized that only one family-member drove?   OBJECT | NON-ISLAND | LONG

    l.   Who hopes that Ben recognized that only one family-member drove your car?   OBJECT | NON-ISLAND | SHORT

(119)   ITEM 5

    a.   Which form do you know that Heather said that she is the only accountant who filed?   PREDICATE | ISLAND | LONG

    b.   Who knows that Heather said that she is the only accountant who filed this form?   PREDICATE | ISLAND | SHORT

    c.   Which form do you know that Heather said that only one accountant filed?   PREDICATE | NON-ISLAND | LONG

    d.   Who knows that Heather said that only one accountant filed this form?   PREDICATE | NON-ISLAND | SHORT

    e.   Which form do you know that there is only one accountant who filed?   EXISTENTIAL | ISLAND | LONG

    f.   Who knows that there is only one accountant who filed this form?   EXISTENTIAL | ISLAND | SHORT

    g.   Which form do you know that there is only one accountant filing?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who knows that there is only one accountant filing this file?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which form do you know that Heather noticed the only accountant who filed?   OBJECT | ISLAND | LONG

    j.   Who knows that Heather noticed the only accountant who filed this form?   OBJECT | ISLAND | SHORT

    k.   Which form do you know that Heather noticed that only one accountant filed?   OBJECT | NON-ISLAND | LONG

    l.   Who knows that Heather noticed that only one accountant filed this form?   OBJECT | NON-ISLAND | SHORT

(120)   ITEM 6

    a.   Which apartment did you say that Adam thinks that he is the only tenant who occupied?   PREDICATE | ISLAND | LONG

    b.   Who said that Adam thinks that he is the only tenant who occupied your apartment?   PREDICATE | ISLAND | SHORT

    c.   Which apartment did you say that Adam thinks that only one tenant occupied?   PREDICATE | NON-ISLAND | LONG

    d.   Who said that Adam thinks that only one tenant occupied your apartment?   PREDICATE | NON-ISLAND | SHORT

    e.   Which apartment did you say that there is only one tenant who occupied?   EXISTENTIAL | ISLAND | LONG

    f.   Who said that there is only one tenant who occupied your apartment?   EXISTENTIAL | ISLAND | SHORT

    g.   Which apartment did you say that there is only one tenant occupying?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who said that there is only one tenant occupying your apartment?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which apartment did you say that Adam found only one tenant who occupied?   OBJECT | ISLAND | LONG

    j.   Who said that Adam found only one tenant who occupied your apartment?   OBJECT | ISLAND | SHORT

    k.   Which apartment did you say that Adam found that only one tenant occupied?   OBJECT | NON-ISLAND | LONG

    l.   Who said that Adam found that only one tenant occupied your apartment?   OBJECT | NON-ISLAND | SHORT

(121)   ITEM 7

a.   Which painting do you think that Courtney believes that she is the only art collector who bid on?

PREDICATE | ISLAND | LONG

b.   Who thinks that Courtney believes that she is the only art collector who bid on this painting?

PREDICATE | ISLAND | SHORT

c.   Which painting do you think that Courtney believes that only one art collector bid on?

PREDICATE | NON-ISLAND | LONG

d.   Who thinks that Courtney believes that only one art collector bid on this painting?   PREDICATE | NON-ISLAND | SHORT

e.   Which painting do you think that there is only one art collector who bid on?   EXISTENTIAL | ISLAND | LONG

f.   Who thinks that there is only one art collector who bid on this painting?   EXISTENTIAL | ISLAND | SHORT

g.   Which painting do you think that there is only one art collector bidding on?   EXISTENTIAL | NON-ISLAND | LONG

h.   Who thinks that there is only one art collector bidding on this painting?   EXISTENTIAL | NON-ISLAND | SHORT

i.   Which painting do you think that Courtney saw the only art collector who bid on?   OBJECT | ISLAND | LONG

j.   Who thinks that Courtney saw the only art collector who bid on this painting?   OBJECT | ISLAND | SHORT

k.   Which painting do you think that Courtney saw that only one art collector bid on?   OBJECT | NON-ISLAND | LONG

l.   Who thinks that Courtney saw that only one art collector bid on this painting?   OBJECT | NON-ISLAND | SHORT

(122)   ITEM 8

a.   Which mailbox did you claim that Javier said that he is the only neighbor who opened?   PREDICATE | ISLAND | LONG

b.   Who claimed that Javier said that he is the only neighbor who opened your mailbox?   PREDICATE | ISLAND | SHORT

c.   Which mailbox did you claim that Javier said that only one neighbor opened?   PREDICATE | NON-ISLAND | LONG

d.   Who claimed that Javier said that only one neighbor opened your mailbox?   PREDICATE | NON-ISLAND | SHORT

e.   Which mailbox did you claim that there is only one neighbor who opened?   EXISTENTIAL | ISLAND | LONG

f.   Who claimed that there is only one neighbor who opened your mailbox?   EXISTENTIAL | ISLAND | SHORT

g.   Which mailbox did you claim that there is only one neighbor opening?   EXISTENTIAL | NON-ISLAND | LONG

h.   Who claimed that there is only one neighbor opening your mailbox?   EXISTENTIAL | NON-ISLAND | SHORT

i.   Which mailbox did you claim that Javier heard the only neighbor who opened?   OBJECT | ISLAND | LONG

j.   Who claimed that Javier heard the only neighbor who opened your mailbox?   OBJECT | ISLAND | SHORT

k.   Which mailbox did you claim that Javier heard that only one neighbor opened?   OBJECT | NON-ISLAND | LONG

l.   Who claimed that Javier heard that only one neighbor opened your mailbox?   OBJECT | NON-ISLAND | SHORT

(123)   ITEM 9

a.   Which hiding spot do you believe that Serena hopes that she is the only kid who found?   PREDICATE | ISLAND | LONG

b.   Who believes that Serena hopes that she is the only kid who found this hiding spot?   PREDICATE | ISLAND | SHORT

c.   Which hiding spot do you believe that Serena hopes that only one kid found?   PREDICATE | NON-ISLAND | LONG

d.   Who believes that Serena hopes that only one kid found this hiding spot?   PREDICATE | NON-ISLAND | SHORT

e.   Which hiding spot do you believe that there is only one kid who found?   EXISTENTIAL | ISLAND | LONG

f.   Who believes that there is only one kid who found this hiding spot?   EXISTENTIAL | ISLAND | SHORT

g.   Which hiding spot do you believe that there is only one kid finding?   EXISTENTIAL | NON-ISLAND | LONG

h.   Who believes that there is only one kid finding this hiding spot?   EXISTENTIAL | NON-ISLAND | SHORT

i.   Which hiding spot do you believe that Serena noticed the only kid who found?   OBJECT | ISLAND | LONG

j.   Who believes that Serena noticed the only kid who found this hiding spot?   OBJECT | ISLAND | SHORT

k.   Which hiding spot do you believe that Serena noticed that only one kid found?   OBJECT | NON-ISLAND | LONG

l.   Who believes that Serena noticed that only one kid found this hiding spot?   OBJECT | NON-ISLAND | SHORT

71

(124)   ITEM 10

    a.   Which drink do you hope that Paul believes that he is the only customer who ordered?   PREDICATE | ISLAND | LONG

    b.   Who hopes that Paul believes that he is the only customer who ordered this drink?   PREDICATE | ISLAND | SHORT

    c.   Which drink do you hope that Paul believes that only one customer ordered?   PREDICATE | NON-ISLAND | LONG

    d.   Who hopes that Paul believes that only one customer ordered this drink?   PREDICATE | NON-ISLAND | SHORT

    e.   Which drink do you hope that there is only one customer who ordered?   EXISTENTIAL | ISLAND | LONG

    f.   Who hopes that there is only one customer who ordered this drink?   EXISTENTIAL | ISLAND | SHORT

    g.   Which drink do you hope that there is only one customer ordering?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who hopes that there is only one customer ordering this drink?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which drink do you hope that Paul heard the only customer who ordered?   OBJECT | ISLAND | LONG

    j.   Who hopes that Paul heard the only customer who ordered this drink?   OBJECT | ISLAND | SHORT

    k.   Which drink do you hope that Paul heard that only one customer ordered?   OBJECT | NON-ISLAND | LONG

    l.   Who hopes that Paul heard that only one customer ordered this drink?   OBJECT | NON-ISLAND | SHORT

(125)   ITEM 11

    a.   Which park do you know that Leanne thinks that she is the only friend who recommended?   PREDICATE | ISLAND | LONG

    b.   Who knows that Leanne thinks that she is the only friend who recommended this park?   PREDICATE | ISLAND | SHORT

    c.   Which park do you know that Leanne thinks that only one friend recommended?   PREDICATE | NON-ISLAND | LONG

    d.   Who knows that Leanne thinks that only one friend recommended this park?   PREDICATE | NON-ISLAND | SHORT

    e.   Which park do you know that there is only one friend who recommended?   EXISTENTIAL | ISLAND | LONG

    f.   Who knows that there is only one friend who recommended this park?   EXISTENTIAL | ISLAND | SHORT

    g.   Which park do you know that there is only one friend recommending?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who knows that there is only one friend recommending this park?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which park do you know that Leanne heard the only friend who recommended?   OBJECT | ISLAND | LONG

    j.   Who knows that Leanne heard the only friend who recommended this park?   OBJECT | ISLAND | SHORT

    k.   Which park do you know that Leanne heard that only one friend recommended?   OBJECT | NON-ISLAND | LONG

    l.   Who knows that Leanne heard that only one friend recommended this park?   OBJECT | NON-ISLAND | SHORT

(126)   ITEM 12

    a.   Which bus do you think that Henry hopes that he was the only passenger who boarded?   PREDICATE | ISLAND | LONG

    b.   Who thinks that Henry hopes that he was the only passenger who boarded this bus?   PREDICATE | ISLAND | SHORT

    c.   Which bus do you think that Henry hopes that only one passenger boarded?   PREDICATE | NON-ISLAND | LONG

    d.   Who thinks that Henry hopes that only one passenger boarded this bus?   PREDICATE | NON-ISLAND | SHORT

    e.   Which bus do you think that there is only one passenger who boarded?   EXISTENTIAL | ISLAND | LONG

    f.   Who thinks that there is only one passenger who boarded this bus?   EXISTENTIAL | ISLAND | SHORT

    g.   Which bus do you think that there is only one passenger boarding?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who thinks that there is only one passenger boarding this bus?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which bus do you think that Henry saw the only passenger who boarded?   OBJECT | ISLAND | LONG

    j.   Who thinks that Henry saw the only passenger who boarded this bus?   OBJECT | ISLAND | SHORT

    k.   Which bus do you think that Henry saw that only one passenger boarded?   OBJECT | NON-ISLAND | LONG

    l.   Who thinks that Henry saw that only one passenger boarded this bus?   OBJECT | NON-ISLAND | SHORT

(127) ITEM 13

    a.   Which shoes did you say that Wanda thinks that she is the only player who wears?   PREDICATE | ISLAND | LONG

    b.   Who said that Wanda thinks that she is the only player who wears these shoes?   PREDICATE | ISLAND | SHORT

    c.   Which shoes did you say that Wanda thinks that only one player wears?   PREDICATE | NON-ISLAND | LONG

    d.   Who said that Wanda thinks that only one player wears these shoes?   PREDICATE | NON-ISLAND | SHORT

    e.   Which shoes did you say that there is only one player who wears?   EXISTENTIAL | ISLAND | LONG

    f.   Who said that there is only one player who wears these shoes?   EXISTENTIAL | ISLAND | SHORT

    g.   Which shoes did you say that there is only one player wearing?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who said that there is only one player wearing these shoes?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which shoes did you say that Wanda discovered the only player who wears?   OBJECT | ISLAND | LONG

    j.   Who said that Wanda discovered the only player who wears these shoes?   OBJECT | ISLAND | SHORT

    k.   Which shoes did you say that Wanda discovered that only one player wears?   OBJECT | NON-ISLAND | LONG

    l.   Who said that Wanda discovered that only one player wears these shoes?   OBJECT | NON-ISLAND | SHORT

(128) ITEM 14

    a.   Which tattoo did you claim that Karl says that he is the only artist who mentioned?   PREDICATE | ISLAND | LONG

    b.   Who claimed that Karl says that he is the only artist who mentioned your tattoo?   PREDICATE | ISLAND | SHORT

    c.   Which tattoo did you claim that Karl says that only one artist mentioning?   PREDICATE | NON-ISLAND | LONG

    d.   Who claimed that Karl says that only one artist mentioned your tattoo?   PREDICATE | NON-ISLAND | SHORT

    e.   Which tattoo did you claim that there is only one artist who mentioned?   EXISTENTIAL | ISLAND | LONG

    f.   Who claimed that there is only one artist who mentioned your tattoo?   EXISTENTIAL | ISLAND | SHORT

    g.   Which tattoo did you claim that there is only one artist mentioning?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who claimed that there is only one artist mentioning your tattoo?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which tattoo did you claim that Karl noticed the only artist who mentioned?   OBJECT | ISLAND | LONG

    j.   Who claimed that Karl noticed the only artist who mentioned your tattoo?   OBJECT | ISLAND | SHORT

    k.   Which tattoo did you claim that Karl noticed that only one artist mentioned?   OBJECT | NON-ISLAND | LONG

    l.   Who claimed that Karl noticed that only one artist that mentioned your tattoo?   OBJECT | NON-ISLAND | SHORT

(129) ITEM 15

    a.   Which flight do you believe that Octavia claimed that she is the only doctor who boarded?   PREDICATE | ISLAND | LONG

    b.   Who believes that Octavia claimed that she is the only doctor who boarded this flight?   PREDICATE | ISLAND | SHORT

    c.   Which flight do you believe that Octavia claimed that only one doctor boarded?   PREDICATE | NON-ISLAND | LONG

    d.   Who believes that Octavia claimed that only one doctor boarded this flight?   PREDICATE | NON-ISLAND | SHORT

    e.   Which flight do you believe that there is only one doctor who boarded?   EXISTENTIAL | ISLAND | LONG

    f.   Who believes that there is only one doctor who boarded this flight?   EXISTENTIAL | ISLAND | SHORT

    g.   Which flight do you believe that there is only one doctor boarding?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who believes that there is only one doctor boarding this flight?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which flight do you believe that Octavia found the only doctor who boarded?   OBJECT | ISLAND | LONG

    j.   Who believes that Octavia found the only doctor who boarded this flight?   OBJECT | ISLAND | SHORT

    k.   Which flight do you believe that Octavia found that only one doctor boarded?   OBJECT | NON-ISLAND | LONG

    l.   Who believes that Octavia found that only one doctor boarded this flight?   OBJECT | NON-ISLAND | SHORT

(130)   ITEM 16

    a.   Which classroom do you hope that Philip believes that he is the only custodian who cleaned?

                PREDICATE | ISLAND | LONG

    b.   Who hopes that Philip believes that he is the only custodian who cleaned this classroom?   PREDICATE | ISLAND | SHORT

    c.   Which classroom do you hope that Philip believes that only one custodian cleaned?   PREDICATE | NON-ISLAND | LONG

    d.   Who hopes that Philip believes that only one custodian cleaned this classroom?   PREDICATE | NON-ISLAND | SHORT

    e.   Which classroom do you hope that there is only one custodian who cleaned?   EXISTENTIAL | ISLAND | LONG

    f.   Who hopes that there is only one custodian who cleaned this classroom?   EXISTENTIAL | ISLAND | SHORT

    g.   Which classroom do you hope that there is only one custodian cleaning?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who hopes that there is only one custodian cleaning this classroom?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which classroom do you hope that Philip noticed the only custodian who cleaned?   OBJECT | ISLAND | LONG

    j.   Who hopes that Philip noticed the only custodian who cleaned this classroom?   OBJECT | ISLAND | SHORT

    k.   Which classroom do you hope that Philip noticed that only one custodian cleaned?   OBJECT | NON-ISLAND | LONG

    l.   Who hopes that Philip noticed that only one custodian cleaned this classroom?   OBJECT | NON-ISLAND | SHORT

(131)   ITEM 17

    a.   Which repair shop do you know that Jasmine hopes that she is the only customer who reviewed?

                PREDICATE | ISLAND | LONG

    b.   Who knows that Jasmine hopes that she is the only customer who reviewed this repair shop?

                PREDICATE | ISLAND | SHORT

    c.   Which repair shop do you know that Jasmine hopes that only one customer reviewed?

                PREDICATE | NON-ISLAND | LONG

    d.   Who knows that Jasmine hopes that only one customer reviewed this repair shop?   PREDICATE | NON-ISLAND | SHORT

    e.   Which repair shop do you know that there is only one customer who reviewed?   EXISTENTIAL | ISLAND | LONG

    f.   Who knows that there is only one customer who reviewed this repair shop?   EXISTENTIAL | ISLAND | SHORT

    g.   Which repair shop do you know that there is only one customer reviewing?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who knows that there is only one customer reviewing this repair shop?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which repair shop do you know that Jasmine saw the only customer who reviewed?   OBJECT | ISLAND | LONG

    j.   Who knows that Jasmine saw the only customer who reviewed this repair shop?   OBJECT | ISLAND | SHORT

    k.   Which repair shop do you know that Jasmine saw that only one customer reviewed?   OBJECT | NON-ISLAND | LONG

    l.   Who knows that Jasmine saw that only one customer reviewed this repair shop?   OBJECT | NON-ISLAND | SHORT

(132)   ITEM 18

    a.   Which turtle do you think that Earl hopes that he is the only visitor who fed?   PREDICATE | ISLAND | LONG

    b.   Who thinks that Earl hopes that he is the only visitor who fed this turtle?   PREDICATE | ISLAND | SHORT

    c.   Which turtle do you think that Earl hopes that only one visitor fed?   PREDICATE | NON-ISLAND | LONG

    d.   Who thinks that Earl hopes that only one visitor fed this turtle?   PREDICATE | NON-ISLAND | SHORT

    e.   Which turtle do you think that there is only one visitor who fed?   EXISTENTIAL | ISLAND | LONG

    f.   Who thinks that there is only one visitor who fed this turtle?   EXISTENTIAL | ISLAND | SHORT

    g.   Which turtle do you think that there is only one visitor feeding?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who thinks that there is only one visitor feeding this turtle?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which turtle do you think that Earl found the only visitor who fed?   OBJECT | ISLAND | LONG

    j.   Who thinks that Earl found the only visitor who fed this turtle?   OBJECT | ISLAND | SHORT

    k.   Which turtle do you think that Earl found that only one visitor fed?   OBJECT | NON-ISLAND | LONG

    l.   Who thinks that Earl found that only one visitor fed this turtle?   OBJECT | NON-ISLAND | SHORT

(133) ITEM 19

    a.   Which book did you say that Farrah thinks that she is the only student who read?   PREDICATE | ISLAND | LONG

    b.   Who says that Farrah thinks that she is the only student who read this book?   PREDICATE | ISLAND | SHORT

    c.   Which book did you say that Farrah thinks that only one student read?   PREDICATE | NON-ISLAND | LONG

    d.   Who says that Farrah thinks that only one student read this book?   PREDICATE | NON-ISLAND | SHORT

    e.   Which book did you say that there is only one student who read?   EXISTENTIAL | ISLAND | LONG

    f.   Who says that here is only one student who read this book?   EXISTENTIAL | ISLAND | SHORT

    g.   Which book did you say that there is only one student reading?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who says that there is only one student reading this book?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which book did you say that Farrah noticed the only student who read?   OBJECT | ISLAND | LONG

    j.   Who says that Farrah noticed the only student who read this book?   OBJECT | ISLAND | SHORT

    k.   Which book did you say that Farrah noticed that only one student read?   OBJECT | NON-ISLAND | LONG

    l.   Who says that Farrah noticed that only one student read this book?   OBJECT | NON-ISLAND | SHORT

(134) ITEM 20

    a.   Which patient did you claim that Otto says that he is the only nurse who helped?   PREDICATE | ISLAND | LONG

    b.   Who claimed that Otto says that he is the only nurse who helped this patient?   PREDICATE | ISLAND | SHORT

    c.   Which patient did you claim that Otto says that only one surgeon helped?   PREDICATE | NON-ISLAND | LONG

    d.   Who claimed that Otto says that only one nurse helped this patient?   PREDICATE | NON-ISLAND | SHORT

    e.   Which patient did you claim that there is only one nurse who helped?   EXISTENTIAL | ISLAND | LONG

    f.   Who claimed that there is only one nurse who helps this patient?   EXISTENTIAL | ISLAND | SHORT

    g.   Which patient did you claim that there is only one nurse helping?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who claimed that there is only one nurse helping this patient?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which patient did you claim that Otto saw the only nurse who helped?   OBJECT | ISLAND | LONG

    j.   Who claimed that Otto saw the only nurse who helped this patient?   OBJECT | ISLAND | SHORT

    k.   Which patient did you claim that Otto saw that only one nurse helped?   OBJECT | NON-ISLAND | LONG

    l.   Who claimed that Otto saw that only one nurse helped this patient?   OBJECT | NON-ISLAND | SHORT

(135) ITEM 21

    a.   Which town do you believe that Ursula claimed that she is the only tourist who visited?   PREDICATE | ISLAND | LONG

    b.   Who believes that Ursula claimed that she is the only tourist who visited this town?   PREDICATE | ISLAND | SHORT

    c.   Which town do you believe that Ursula claimed that only one tourist visited?   PREDICATE | NON-ISLAND | LONG

    d.   Who believes that Ursula claimed that only one tourist visited this town?   PREDICATE | NON-ISLAND | SHORT

    e.   Which town do you believe that there is only one tourist who visited?   EXISTENTIAL | ISLAND | LONG

    f.   Who believes that there is only one tourist who visited this town?   EXISTENTIAL | ISLAND | SHORT

    g.   Which town do you believe that there is only one tourist visiting?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who believes that there is only one tourist visiting this town?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which town do you believe that Ursula found the only tourist who explored?   OBJECT | ISLAND | LONG

    j.   Who believes that Ursula found the only tourist who explored this town?   OBJECT | ISLAND | SHORT

    k.   Which town do you believe that Ursula found that only one tourist explored?   OBJECT | NON-ISLAND | LONG

    l.   Who believes that Ursula found that only one tourist explored this town?   OBJECT | NON-ISLAND | SHORT

(136) Iᴛᴇᴍ 22

    a.   Which album do you hope that Alicia believes that she is the only critic who listened to?   Pʀᴇᴅɪᴄᴀᴛᴇ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    b.   Who hopes that Alicia believes that she is the only critic who listened to this album?   Pʀᴇᴅɪᴄᴀᴛᴇ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    c.   Which album do you hope that Alicia believes that only one critic listened to?   Pʀᴇᴅɪᴄᴀᴛᴇ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    d.   Who hopes that Alicia believes that only one critic listened to this album?   Pʀᴇᴅɪᴄᴀᴛᴇ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    e.   Which album do you hope that there is only one critic who listened to?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    f.   Who hopes that there is only one critic who listened to this album?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    g.   Which album do you hope that there is only one critic listening to?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    h.   Who hopes that there is only one critic listening to this album?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    i.   Which album do you hope that Alicia recognized only one critic who listened to?   Oʙᴊᴇᴄᴛ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    j.   Who hopes that Alicia recognized only one critic who listened to this album?   Oʙᴊᴇᴄᴛ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    k.   Which album do you hope that Alicia recognized that only one critic listened to?   Oʙᴊᴇᴄᴛ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    l.   Who hopes that Alicia recognized that only one critic listened to this album?   Oʙᴊᴇᴄᴛ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

(137) Iᴛᴇᴍ 23

    a.   Which ice cream flavor do you know that Yanny hopes that he is the only person who tasted?
    Pʀᴇᴅɪᴄᴀᴛᴇ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    b.   Who knows that Yanny hopes that he is the only person who tasted this ice cream flavor?   Pʀᴇᴅɪᴄᴀᴛᴇ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    c.   Which ice cream flavor do you know that Yanny hopes that only one person tasted?   Pʀᴇᴅɪᴄᴀᴛᴇ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    d.   Who knows that Yanny hopes that only one person tasted this ice cream flavor?   Pʀᴇᴅɪᴄᴀᴛᴇ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    e.   Which ice cream flavor do you know that there is only one person who tasted?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    f.   Who knows that there is only one person who tasted this ice cream flavor?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    g.   Which ice cream flavor do you know that there is only one person tasting?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    h.   Who knows that there is only one person tasting this ice cream flavor?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    i.   Which ice cream flavor do you know that Yanny noticed the only person who tasted?   Oʙᴊᴇᴄᴛ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    j.   Who knows that Yanny noticed the only person who tasted this ice cream flavor?   Oʙᴊᴇᴄᴛ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    k.   Which ice cream flavor do you know that Yanny noticed that only one person tasted?   Oʙᴊᴇᴄᴛ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    l.   Who knows that Yanny noticed that only one person tasted this ice cream flavor?   Oʙᴊᴇᴄᴛ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

(138) Iᴛᴇᴍ 24

    a.   Which ingredients do you think that Joshua hopes that he is the only chef who forgot?   Pʀᴇᴅɪᴄᴀᴛᴇ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    b.   Who thinks that Joshua hopes that he is the only chef who forgot the ingredients?   Pʀᴇᴅɪᴄᴀᴛᴇ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    c.   Which ingredients do you think that Joshua hopes that only one chef forgot?   Pʀᴇᴅɪᴄᴀᴛᴇ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    d.   Who thinks that Joshua hopes that only one chef forgot the ingredients?   Pʀᴇᴅɪᴄᴀᴛᴇ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    e.   Which ingredients do you think that there is only one chef who forgot?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    f.   Who thinks that there is only one chef who forgot the ingredients?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    g.   Which ingredients do you think that there is only one chef forgetting?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    h.   Who thinks that there is only one chef forgetting the ingredients?   Exɪꜱᴛᴇɴᴛɪᴀʟ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    i.   Which ingredients do you think that Joshua mentioned the only chef who forgot?   Oʙᴊᴇᴄᴛ | Iꜱʟᴀɴᴅ | Lᴏɴɢ

    j.   Who thinks that Joshua mentioned the only chef who forgot the ingredients?   Oʙᴊᴇᴄᴛ | Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

    k.   Which ingredients do you think that Joshua mentioned that only one chef forgot?   Oʙᴊᴇᴄᴛ | Nᴏɴ-Iꜱʟᴀɴᴅ | Lᴏɴɢ

    l.   Who thinks that Joshua mentioned that only one chef forgot the ingredients?   Oʙᴊᴇᴄᴛ | Nᴏɴ-Iꜱʟᴀɴᴅ | Sʜᴏʀᴛ

(139)   ITEM 25

    a.   Which shirt did you say that Miriam thinks that she is the only team-member who wore?   PREDICATE | ISLAND | LONG

    b.   Who said that Miriam thinks that she is the only team-member who wore this shirt?   PREDICATE | ISLAND | SHORT

    c.   Which shirt did you say that Miriam thinks that only one team-member wore?   PREDICATE | NON-ISLAND | LONG

    d.   Who said that Miriam thinks that only one team-member wore this shirt?   PREDICATE | NON-ISLAND | SHORT

    e.   Which shirt did you say that there is only one team-member who wore?   EXISTENTIAL | ISLAND | LONG

    f.   Who said that there is only one team-member who wore this shirt?   EXISTENTIAL | ISLAND | SHORT

    g.   Which shirt did you say that there is only one team-member wearing?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who said that there is only one team-member wearing this shirt?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which shirt did you say that Miriam saw only one team-member who wore?   OBJECT | ISLAND | LONG

    j.   Who said that Miriam saw only one team-member who wore this shirt?   OBJECT | ISLAND | SHORT

    k.   Which shirt did you say that Miriam saw that only one team-member wore?   OBJECT | NON-ISLAND | LONG

    l.   Who said that Miriam saw that only one team-member wore this shirt?   OBJECT | NON-ISLAND | SHORT

(140)   ITEM 26

    a.   Which box of cookies did you claim that Stan said that he is the only kid who ate?   PREDICATE | ISLAND | LONG

    b.   Who claimed that Stan said that he is the only kid who ate this box of cookies?   PREDICATE | ISLAND | SHORT

    c.   Which box of cookies did you claim that Stan said that only one kid ate?   PREDICATE | NON-ISLAND | LONG

    d.   Who claimed that Stan said that only one kid ate this box of cookies?   PREDICATE | NON-ISLAND | SHORT

    e.   Which box of cookies did you claim that there is only one kid who ate?   EXISTENTIAL | ISLAND | LONG

    f.   Who claimed that there is only one kid who ate this box of cookies?   EXISTENTIAL | ISLAND | SHORT

    g.   Which box of cookies did you claim that there is only one kid eating?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who claimed that there is only one kid eating this box of cookies?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which box of cookies did you claim that Stan found the only kid who ate?   OBJECT | ISLAND | LONG

    j.   Who claimed that Stan found the only kid who ate this box of cookies?   OBJECT | ISLAND | SHORT

    k.   Which box of cookies did you claim that Stan found that only one kid ate?   OBJECT | NON-ISLAND | LONG

    l.   Who claimed that Stan found that only one kid ate this box of cookies?   OBJECT | NON-ISLAND | SHORT

(141)   ITEM 27

    a.   Which app do you believe that Maddy claimed that she is the only developer who built?   PREDICATE | ISLAND | LONG

    b.   Who believes that Maddy claimed that she is the only developer who built this app?   PREDICATE | ISLAND | SHORT

    c.   Which app do you believe that Maddy claimed that only one developer built?   PREDICATE | NON-ISLAND | LONG

    d.   Who believes that Maddy claimed that only one developer built this app?   PREDICATE | NON-ISLAND | SHORT

    e.   Which app do you believe that there is only one developer who built?   EXISTENTIAL | ISLAND | LONG

    f.   Who believes that there is only one developer who built this app?   EXISTENTIAL | ISLAND | SHORT

    g.   Which app do you believe that there is only one developer building?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who believes that there is only one developer building this app?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which app do you believe that Maddy found the only developer who built?   OBJECT | ISLAND | LONG

    j.   Who believes that Maddy found the only developer who built this app?   OBJECT | ISLAND | SHORT

    k.   Which app do you believe that Maddy found that only one developer built?   OBJECT | NON-ISLAND | LONG

    l.   Who believes that Maddy found that only one developer built this app?   OBJECT | NON-ISLAND | SHORT

(142)   ITEM 28

    a.   Which machine do you hope that Paul believes that he is the only employee who operates?

              PREDICATE | ISLAND | LONG

    b.   Who hopes that Paul believes that he is the only employee who operates this machine?   PREDICATE | ISLAND | SHORT

    c.   Which machine do you hope that Paul believes that only one employee operates?   PREDICATE | NON-ISLAND | LONG

    d.   Who hopes that Paul believes that only one employee operates this machine?   PREDICATE | NON-ISLAND | SHORT

    e.   Which machine do you hope that there is only one employee who operates?   EXISTENTIAL | ISLAND | LONG

    f.   Who hopes that there is only one employee who operates this machine?   EXISTENTIAL | ISLAND | SHORT

    g.   Which machine do you hope that there is only one employee operating?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who hopes that there is only one employee operating this machine?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which machine do you hope that Paul found the only employee who operates?   OBJECT | ISLAND | LONG

    j.   Who hopes that Paul found the only employee who operates this machine?   OBJECT | ISLAND | SHORT

    k.   Which machine do you hope that Paul found that only one employee operates?   OBJECT | NON-ISLAND | LONG

    l.   Who hopes that Paul found that only one employee operates this machine?   OBJECT | NON-ISLAND | SHORT

(143)   ITEM 29

    a.   Which insect did you say that Janet hopes that she is the only scientist who studies?   PREDICATE | ISLAND | LONG

    b.   Who said that Janet hopes that she is the only scientist who studies this insect?   PREDICATE | ISLAND | SHORT

    c.   Which insect did you say that Janet hopes that only one scientist studies?   PREDICATE | NON-ISLAND | LONG

    d.   Who said that Janet hopes that only one scientist studies this insect?   PREDICATE | NON-ISLAND | SHORT

    e.   Which insect did you say that there is only one scientist who studies?   EXISTENTIAL | ISLAND | LONG

    f.   Who said that there is only one scientist who studies this insect?   EXISTENTIAL | ISLAND | SHORT

    g.   Which insect did you say that there is only one scientist studying?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who said that there is only one scientist studying this insect?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which insect did you say that Janet noticed the only scientist who studies?   OBJECT | ISLAND | LONG

    j.   Who said that Janet noticed the only scientist who studies this insect?   OBJECT | ISLAND | SHORT

    k.   Which insect did you say that Janet noticed that only one scientist studies?   OBJECT | NON-ISLAND | LONG

    l.   Who said that Janet noticed that only one scientist studies this insect?   OBJECT | NON-ISLAND | SHORT

(144)   ITEM 30

    a.   Which taxi do you think that Mel hopes that he is the only guy who leased?   PREDICATE | ISLAND | LONG

    b.   Who thinks that Mel hopes that he is the only guy who leased this taxi?   PREDICATE | ISLAND | SHORT

    c.   Which taxi do you think that Mel hopes that only one guy leased?   PREDICATE | NON-ISLAND | LONG

    d.   Who thinks that Mel hopes that only one guy leased this taxi?   PREDICATE | NON-ISLAND | SHORT

    e.   Which taxi do you think that there is only one guy who leased?   EXISTENTIAL | ISLAND | LONG

    f.   Who thinks that there is only one guy who leased this taxi?   EXISTENTIAL | ISLAND | SHORT

    g.   Which taxi do you think that there is only one guy leasing?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who thinks that there is only one guy leasing this taxi?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which taxi do you think that Mel saw the only guy who leased?   OBJECT | ISLAND | LONG

    j.   Who thinks that Mel saw the only guy who leased this taxi?   OBJECT | ISLAND | SHORT

    k.   Which taxi do you think that Mel saw that only one guy leased?   OBJECT | NON-ISLAND | LONG

    l.   Who thinks that Mel saw that only one guy leased this taxi?   OBJECT | NON-ISLAND | SHORT

(145)   ITEM 31

    a.   Which comic book did you say that Nadine thinks that she is the only nerd who bought?   PREDICATE | ISLAND | LONG

    b.   Who said that Nadine thinks that she is the only nerd who bought this comic book?   PREDICATE | ISLAND | SHORT

    c.   Which comic book did you say that Nadine thinks that only one nerd bought?   PREDICATE | NON-ISLAND | LONG

    d.   Who said that Nadine thinks that only one nerd bought this comic book?   PREDICATE | NON-ISLAND | SHORT

    e.   Which comic book did you say that there is only one nerd who bought?   EXISTENTIAL | ISLAND | LONG

    f.   Who said that there is only one nerd who bought this comic book?   EXISTENTIAL | ISLAND | SHORT

    g.   Which comic book did you say that there is only one nerd buying?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who said that there is only one nerd buying this comic book?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which comic book did you say that Nadine found the only nerd who bought?   OBJECT | ISLAND | LONG

    j.   Who said that Nadine found the only nerd who bought this comic book?   OBJECT | ISLAND | SHORT

    k.   Which comic book did you say that Nadine found that only one nerd bought?   OBJECT | NON-ISLAND | LONG

    l.   Who said that Nadine found that only one nerd bought this comic book?   OBJECT | NON-ISLAND | SHORT

(146)   ITEM 32

    a.   Which instrument did you claim that Grover said that he is the only musician who plays?   PREDICATE | ISLAND | LONG

    b.   Who claimed that Grover said that he is the only musician who plays this instrument?   PREDICATE | ISLAND | SHORT

    c.   Which instrument did you claim that Grover said that only one musician plays?   PREDICATE | NON-ISLAND | LONG

    d.   Who claimed that Grover said that only one musician plays this instrument?   PREDICATE | NON-ISLAND | SHORT

    e.   Which instrument did you claim that there is only one musician who plays?   EXISTENTIAL | ISLAND | LONG

    f.   Who claimed that there is only one musician who plays this instrument?   EXISTENTIAL | ISLAND | SHORT

    g.   Which instrument did you claim that there is only one musician playing?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who claimed that there is only one musician playing this instrument?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which instrument did you claim that Grover heard only one musician who plays?   OBJECT | ISLAND | LONG

    j.   Who claimed that Grover heard only one musician who plays this instrument?   OBJECT | ISLAND | SHORT

    k.   Which instrument did you claim that Grover heard that only one musician plays?   OBJECT | NON-ISLAND | LONG

    l.   Who claimed that Grover heard that only one musician plays this instrument?   OBJECT | NON-ISLAND | SHORT

(147)   ITEM 33

    a.   Which iPhone do you believe that Jacky claims that she is the only student who uses?   PREDICATE | ISLAND | LONG

    b.   Who believes that Jacky claims that she is the only student who uses this iPhone?   PREDICATE | ISLAND | SHORT

    c.   Which iPhone do you believe that Jacky claims that only one student uses?   PREDICATE | NON-ISLAND | LONG

    d.   Who believes that Jacky claims that only one student uses this iPhone?   PREDICATE | NON-ISLAND | SHORT

    e.   Which iPhone do you believe that there is only one student who uses?   EXISTENTIAL | ISLAND | LONG

    f.   Who believes that there is only one student who uses this iPhone?   EXISTENTIAL | ISLAND | SHORT

    g.   Which iPhone do you believe that there is only one student using?   EXISTENTIAL | NON-ISLAND | LONG

    h.   Who believes that there is only one student using this iPhone?   EXISTENTIAL | NON-ISLAND | SHORT

    i.   Which iPhone do you believe that Jacky noticed the only student who uses?   OBJECT | ISLAND | LONG

    j.   Who believes that Jacky noticed the only student who uses this iPhone?   OBJECT | ISLAND | SHORT

    k.   Which iPhone do you believe that Jacky noticed that only one student uses?   OBJECT | NON-ISLAND | LONG

    l.   Who believes that Jacky noticed that only one student uses this iPhone?   OBJECT | NON-ISLAND | SHORT

(148)   ITEM 34

a.   Which kind of cookie do you hope that Zeke believes that he is the only co-worker who relishes?
    PREDICATE | ISLAND | LONG

b.   Who hopes that Zeke believes that he is the only co-worker who relishes this kind of cookie?
    PREDICATE | ISLAND | SHORT

c.   Which kind of cookie do you hope that Zeke believes that only one co-worker relishes?
    PREDICATE | NON-ISLAND | LONG

d.   Who hopes that Zeke believes that only one co-worker enjoys this kind of cookie?   PREDICATE | NON-ISLAND | SHORT

e.   Which kind of cookie do you hope that there is only one co-worker who enjoys?   EXISTENTIAL | ISLAND | LONG

f.   Who hopes that there is only one co-worker who enjoys this kind of cookie?   EXISTENTIAL | ISLAND | SHORT

g.   Which kind of cookie do you hope that there is only one co-worker enjoying?   EXISTENTIAL | NON-ISLAND | LONG

h.   Who hopes that there is only one co-worker who enjoys this kind of cookie?   EXISTENTIAL | NON-ISLAND | SHORT

i.   Which kind of cookie do you hope that Zeke remembered the only co-worker who enjoys?   OBJECT | ISLAND | LONG

j.   Who hopes that Zeke remembered the only co-worker who enjoys this kind of cookie?   OBJECT | ISLAND | SHORT

k.   Which kind of cookie do you hope that Zeke remembered that only one co-worker enjoys?
    OBJECT | NON-ISLAND | LONG

l.   Who hopes that Zeke remembered that only one co-worker enjoys this kind of cookie?   OBJECT | NON-ISLAND | SHORT

(149)   ITEM 35

a.   Which grandparent do you know that Abby hopes that she is the only cousin who visited?
    PREDICATE | ISLAND | LONG

b.   Who knows that Abby hopes that she is the only cousin who visited this grandparent?   PREDICATE | ISLAND | SHORT

c.   Which grandparent do you know that Abby hopes that only one cousin visited?   PREDICATE | NON-ISLAND | LONG

d.   Who knows that Abby hopes that only one cousin visited this grandparent?   PREDICATE | NON-ISLAND | SHORT

e.   Which grandma do you know that there is only one cousin who visited?   EXISTENTIAL | ISLAND | LONG

f.   Who knows that there is only one cousin who visited your grandma?   EXISTENTIAL | ISLAND | SHORT

g.   Which grandma do you know that there is only one cousin visiting?   EXISTENTIAL | NON-ISLAND | LONG

h.   Who knows that there is only one cousin visiting your grandma?   EXISTENTIAL | NON-ISLAND | SHORT

i.   Which grandma do you know that Abby remembered the only cousin who visited?   OBJECT | ISLAND | LONG

j.   Who knows that Abby remembered the only cousin who visited your grandma?   OBJECT | ISLAND | SHORT

k.   Which grandma do you know that Abby remembered that only one cousin visited?   OBJECT | NON-ISLAND | LONG

l.   Who knows that Abby remembered only one cousin visited your grandma?   OBJECT | NON-ISLAND | SHORT

(150)   ITEM 36

a.   Which rumor do you think that Mark believes that he is the only candidate who denied?   PREDICATE | ISLAND | LONG

b.   Who thinks that Mark believes that he is the only candidate who denied this rumor?   PREDICATE | ISLAND | SHORT

c.   Which rumor do you think that Mark believes that only one candidate denied?   PREDICATE | NON-ISLAND | LONG

d.   Who thinks that Mark believes that only one candidate denied this rumor?   PREDICATE | NON-ISLAND | SHORT

e.   Which rumor do you think that there is only one candidate who denied?   EXISTENTIAL | ISLAND | LONG

f.   Who thinks that there is only one candidate who denied this rumor?   EXISTENTIAL | ISLAND | SHORT

g.   Which rumor do you think that there is only one candidate denying?   EXISTENTIAL | NON-ISLAND | LONG

h.   Who thinks that there is only one candidate denying this rumor?   EXISTENTIAL | NON-ISLAND | SHORT

i.   Which rumor do you think that Mark mentioned the only candidate who denied?   OBJECT | ISLAND | LONG

j.   Who thinks that Mark mentioned the only candidate who denied this rumor?   OBJECT | ISLAND | SHORT

k.   Which rumor do you think that Mark mentioned that only one candidate denied?   OBJECT | NON-ISLAND | LONG

l.   Who thinks that Mark mentioned that only one candidate denied this rumor?   OBJECT | NON-ISLAND | SHORT

E Experiment 1 pen-and-paper survey sample

[See following page.]

Sentence Rating Experiment

Welcome to my experiment! This task involves reading English sentences and rating how accept-able each sentence sounds to you. What I mean by *acceptability* here is how natural or normal the sentence sounds to you as a sentence of English. I am interested in your **intuitive** judgments, which might be different from the judgments you'd expect an English teacher to give. After each sentence, you'll find a set of numbers from 1 to 6. Give your rating of the sentence by circling one of the numbers following that sentence. Use the following scale for reference, which is included at the top of each page.

1	2	3	4	5	6
clearly bad	*pretty bad*	*somewhat bad*	*somewhat good*	*pretty good*	*clearly good*

Using this scale, I might rate a sentence like *"Marianne asked the doctor to examine her knee"* as a **6**, since it sounds like a normal sentence of English that I could imagine saying in the right circumstance. If I was presented with a sentence like *"Paul asked if such books Liz only reads at home,"* I might give it a **3**—something's a little off about it to me, and I know I would say it differently. Finally, I might give a sentence like *"I seem eating sushi"* a **1**—I'm not entirely sure what it would even mean, and it's definitely not something I could imagine myself or another fluent English speaker saying, even in the right situation. Okay, here are the sentences!

What did Peter predict a lending crisis that would trigger?   1 2 3 4 5 6

They all have left and they have done all so deliberately.   1 2 3 4 5 6

The fork is silver-plated and the bowl is enameled.   1 2 3 4 5 6

What did Stefan reveal the Uber driver who became?   1 2 3 4 5 6

How likely to win the race does Susan think John is?   1 2 3 4 5 6

John promised Mary to leave, and Sue did to write more poetry.   1 2 3 4 5 6

The students were punished by their parents and their teachers.   1 2 3 4 5 6

Bill asked if such books John only reads when at home.   1 2 3 4 5 6

I told you when we met that Bill will come to the party.   1 2 3 4 5 6

Who made the argument that the new council-member was supported by special interest groups?   1 2 3 4 5 6

Who discovered that story that painted Beatrice poorly?   1 2 3 4 5 6

1	2	3	4	5	6
clearly bad	*pretty bad*	*somewhat bad*	*somewhat good*	*pretty good*	*clearly good*

What did Amanda teach that Americans started?   1 2 3 4 5 6

Joe broke a cup, and Marianne did so with a saucer.   1 2 3 4 5 6

What did Janet suggest artists who used for the mural?   1 2 3 4 5 6

What did Patty hint that a lawyer hopes to delay?   1 2 3 4 5 6

What did a stranger give to which friend of Amanda's?   1 2 3 4 5 6

Who noticed that the teacher wears a bow-tie?   1 2 3 4 5 6

I told you when we met that Bill will come to the party.   1 2 3 4 5 6

Which book did Benjamin argue that Theo returned before reading?   1 2 3 4 5 6

What did Peter find that a newspaper reprinted?   1 2 3 4 5 6

Amanda went to Santa Cruz, and Bill thinks Claire to Monterey.   1 2 3 4 5 6

What the students believe is they will pass the exam.   1 2 3 4 5 6

Last night there was an attempt to shoot oneself.   1 2 3 4 5 6

What do you think that the lawyer forgot at the office?   1 2 3 4 5 6

Deciding which movie to see next makes John very happy.   1 2 3 4 5 6

When this column she started to write, I thought she would be fine.   1 2 3 4 5 6

At that battle the generals who lost were given hell.   1 2 3 4 5 6

Who claimed that the university wants to hire Stanley?   1 2 3 4 5 6

Who questioned that Tobias would finish the project?   1 2 3 4 5 6

What did Amelia warn that a government would take over?   1 2 3 4 5 6

Who did he give statues of to all the season-ticket holders?   1 2 3 4 5 6

1	2	3	4	5	6
clearly bad	*pretty bad*	*somewhat bad*	*somewhat good*	*pretty good*	*clearly good*

What did Briana respect that the citizens dislike?   1 2 3 4 5 6

Who understands that the teachers dislike unstapled papers?   1 2 3 4 5 6

Who appreciated that Sally gave gifts to all her teachers?   1 2 3 4 5 6

Lloyd Webber musicals are easy to condemn without even watching.   1 2 3 4 5 6

What did the president predict that Jeb wouldn't do?   1 2 3 4 5 6

Sandy plays the guitar better than Betsy the harmonica.   1 2 3 4 5 6

Who appreciated students who finished the optional assignment?   1 2 3 4 5 6

Lily will dance with the person the king chooses.   1 2 3 4 5 6

Who believes salesmen who wash their car every weekend?   1 2 3 4 5 6

If frankly he's unable to cope, we'll have to replace him.   1 2 3 4 5 6

Who confessed that the rival team planned to sabotage the event?   1 2 3 4 5 6

Sarah convinced Bill that he would go to the party.   1 2 3 4 5 6

I don't think that I will invite any linguists to the party.   1 2 3 4 5 6

What did Reggie believe that Peter fixed last week?   1 2 3 4 5 6

Who the hell did Brenda suggest is in love with who?   1 2 3 4 5 6

Max may have been studying, but Jason may have done so too.   1 2 3 4 5 6

What did Anton expose a lie that the committee used up?   1 2 3 4 5 6

What did Shelley mock a demand that the museum withdraw?   1 2 3 4 5 6

Jack asked Sally to be allowed to take care of himself.   1 2 3 4 5 6

The man that he gave the creeps last night to is over there.   1 2 3 4 5 6

	1	2	3	4	5	6
	clearly bad	*pretty bad*	*somewhat bad*	*somewhat good*	*pretty good*	*clearly good*

Who had a dream that the local bakery would start selling donuts?　　1 2 3 4 5 6

The politician bribes very easily to avoid the draft.　　1 2 3 4 5 6

Who suggested that a book could inspire the practice of witchcraft?　　1 2 3 4 5 6

The cat and dog that were fighting all the time had to be separated.　　1 2 3 4 5 6

What did the teacher say the student gave to whom?　　1 2 3 4 5 6

Mary believed Peter finished school and Bill Peter got a job.　　1 2 3 4 5 6

It will take from three five days for him to recover.　　1 2 3 4 5 6

What did Alicia complain that the mechanic didn't inspect?　　1 2 3 4 5 6

It will take three to five days for him to recover.　　1 2 3 4 5 6

Vivian believes without a doubt her team will win.　　1 2 3 4 5 6

There had all hung over the fireplace the portraits by Picasso.　　1 2 3 4 5 6

What did Joshua convey the feeling that the company shouldn't oversee?　　1 2 3 4 5 6

I told Mr. Smith that I am able to paint the fence together.　　1 2 3 4 5 6

The tree grew a century's growth within only ten years.　　1 2 3 4 5 6

He seems to that Kim might have solved the problems.　　1 2 3 4 5 6

John wants for each person to have fun that you do.　　1 2 3 4 5 6

I find it irritating that usually this street is closed.　　1 2 3 4 5 6

At that battle were given the generals who lost hell.　　1 2 3 4 5 6

They suspected and we believed Peter would visit the hospital.　　1 2 3 4 5 6

At that time, what did they believe that Peter fixed?　　1 2 3 4 5 6

1	2	3	4	5	6
clearly bad	*pretty bad*	*somewhat bad*	*somewhat good*	*pretty good*	*clearly good*

Who made the excuse that Gina made the homework hard to read? 1 2 3 4 5 6

Who repeated a guarantee that the news story would reveal the president's secrets? 1 2 3 4 5 6

Sherry met a man who she found herself very fond of. 1 2 3 4 5 6

That much the less you say, the smarter you will seem. 1 2 3 4 5 6

This is the man who I think will buy your house next year. 1 2 3 4 5 6

Into which room walked the three men that Daniel knows? 1 2 3 4 5 6

We students of physics are taller than you students of chemistry. 1 2 3 4 5 6

I expect that everyone will visit Mary that you do. 1 2 3 4 5 6

What did Steven speculate that the group would discover? 1 2 3 4 5 6

Who issued the threat that the county worker could condemn the property? 1 2 3 4 5 6

Who wrote the character in the book who is afraid of open spaces? 1 2 3 4 5 6

I talked to Mary, with whom you danced yesterday. 1 2 3 4 5 6

Who reported that a group had filed a lawsuit? 1 2 3 4 5 6

Who trusts that a senator cares about the constitution? 1 2 3 4 5 6

What does Brian remember that the students asked everyone in town for? 1 2 3 4 5 6

Who worried that a builder didn't seal the windows? 1 2 3 4 5 6

What did Hector resent the request that the employee undergo? 1 2 3 4 5 6

Who likes the gardeners who mow the lawn once a month? 1 2 3 4 5 6

One interpreter tried to be assigned to every visiting diplomat. 1 2 3 4 5 6

1	2	3	4	5	6
clearly *bad*	*pretty* *bad*	*somewhat* *bad*	*somewhat* *good*	*pretty* *good*	*clearly* *good*

Nadine made the argument that John is illegal to park here.   1 2 3 4 5 6

George overheard that last week Sarah saw pictures of.   1 2 3 4 5 6

What did Wendell know the child who plays in the park?   1 2 3 4 5 6

What the students believe is that they will pass the exam.   1 2 3 4 5 6

How many books were there claimed to be on the table?   1 2 3 4 5 6

I visited a city yesterday near the city that John did.   1 2 3 4 5 6

If you have time, please take a moment to answer a few questions.

1. What is your age? ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯
2. What is your gender? ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯
3. Was it clear what the instructions were asking you to do? ⎯⎯⎯⎯⎯⎯⎯⎯⎯
4. What did you think of the task? Was it hard to choose a rating for the sentences? ⎯⎯⎯⎯

5. Do you think you have an idea what the experiment was about? ⎯⎯⎯⎯⎯⎯⎯

6. One of the things I'm interested in learning from this experiment is whether one of the following sentences is more acceptable to people than the other. Note that the only difference is that *"the"* in the first sentence is switched with *"a"* in the second.

- *What did Nancy make the guess that the dog ate?*

- *What did Nancy make a guess that the dog ate?*

Most people would say that the first sentence is pretty bad, but for some people, the second sentence is slightly better and easier to understand. Would you agree? ⎯⎯⎯⎯⎯⎯

7. Would you participate in an experiment like this again? ⎯⎯⎯⎯⎯⎯⎯

Thank you! :-)