How to Neutralize a Finite Clause Boundary:

Phase Theory and the Grammar of Bound Pronouns

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Abstract: This paper is concerned with a fact about English syntax that has been briefly observed in a handful of places in the literature but never systematically investigated: a bound pronoun in the subject position of a finite embedded clause renders the clause boundary relatively transparent to processes or relations ordinarily confined to monoclausal, control, and raising configurations. For example, *too/enough* movement structures involving a finite clause boundary are degraded in sentences like **This book is too long [for John to claim [that Bill read __ in a day]]* but improved when the finite clause has a bound pronominal subject as in *?This book is too long [for John₁ to claim [that **he₁** read __ in a day]]*. On the empirical side, we show that this bound pronoun effect holds across a wide range of phenomena including but not limited to *too/enough* movement, tough movement, gapping, comparative deletion, antecedent-contained deletion, quantifier scope interaction, multiple questions, pseudogapping, reciprocal binding, and multiple sluicing; and we confirm the effect via a sentence acceptability experiment targeting some of these phenomena. On the theoretical side, we propose an account of the bound pronoun effect that has two crucial ingredients: (1) bound pronouns optionally

enter the derivation with unvalued phi-features and (2) phases are defined in part by convergence, so that under certain conditions, unvalued features void the phasal status of CP and thereby extend the locality domain for syntactic operations.

1 Introduction

English exhibits a number of well studied syntactic phenomena all involving some kind of operation or relation that can be characterized to a very rough first approximation as *clause-bound*, i.e., unable to span a clause boundary. These phenomena include but are not limited to *too/enough* movement, gapping, comparative deletion, antecedent-contained deletion, quantifier scope interaction, and multiple questions. Thus, the sentences in (1) are all perfectly acceptable, whereas the minimal variants in (2) are all degraded in virtue of the clause boundary found in the bracketed portion of each sentence.[1]

(1)   a. This magazine is too low-brow [for John to read __].   *too/enough* MVMT

        b. John likes apples and [Bill ~~\<likes\>~~ oranges].   GAPPING

        c. More people like apples than [~~\<like\>~~ oranges].   CMPTV. DELETION

        d. John reads everything [Bill does ~~\<read\>~~].   ACD

        e. [**At least one professor** reads **every journal**]. ($\forall > \exists$) Q SCOPE

        f. Tell me [**who** reads **which journal**].   MULTIPLE QUEST.

(2)   a. *This magazine is too low-brow [for John to claim that Bill reads __].

        b.*John claims that Mark likes apples and [Bill <~~claims that Mark likes~~>

           oranges].

        c. *More people claim that Bill likes apples [than <~~claim that Bill likes~~>

            oranges].

        d. *John claims that Mark reads everything [Bill does <~~claims that Mark~~

           ~~reads~~>].

        e. *[**At least one professor** claims that Bill reads **every journal**]. (∀>∃)

        f. *Tell me [**who** claims that John reads **which journal**].

        One well known exception to the clause-boundedness witnessed in (1)-(2) is

that *nonfinite* control and raising clause boundaries do not have the same

deleterious effect as do finite clause boundaries. Thus, if we compare the examples

in (2) to minimal variants in which the finite clause boundary is replaced by a

nonfinite clause introduced by control verb *claim* or raising verb *tend*, we find that

the examples become acceptable once again. This is shown in (3).[2]

(3)   a. This magazine is too low-brow [for John to claim/tend to read __].

        b. John claims/tends to like apples and [Bill <~~claims/tends to like~~> oranges].

        c. More people claim/tend to like apples [than <~~claim/tend to like~~> oranges].

        d. John claims/tends to read everything [Bill does <~~claim/tend to read~~>].

        e. [**At least one professor** claims/tends to read **every journal**]. (∀>∃)

        f. Tell me [**who** claims/tends to read **which journal**].

A less widely recognized exception to clause-boundedness — and the focus of this paper — is the observation that even finite clause boundaries can be rendered relatively innocuous in the phenomena in question, provided that the subject of the embedded finite clause is a bound pronoun. We call this the BOUND PRONOUN EFFECT. It is illustrated in (4).[3]

(4)   a. ?This magazine is too low-brow [for John$_1$ to claim that **he$_1$** reads __].

        b. ?John$_1$ claims that **he$_1$** likes apples and [Bill$_2$ <~~claims that~~ **~~he$_2$~~** ~~likes~~> oranges].

        c. ?More people$_1$ claim that **they$_1$** like apples [than <~~claim that~~ **~~they$_1$~~** ~~like~~> oranges].

        d. ?John$_1$ claims that **he$_1$** reads everything [Bill$_2$ does <~~claims that~~ **~~he$_2$~~** ~~reads~~>].

        e. ?[**At least one professor$_1$** claims that **he$_1$** reads **every journal**]. ($\forall > \exists$)

        f. ?Tell me [**who$_1$** claims that **he$_1$** reads **which journal**].

In this paper, we present what is to our knowledge the first experimental documentation of the bound pronoun effect — in the form of a sentence acceptability experiment designed using the tools described in Erlewine & Kotek (2016) and conducted via Amazon's Mechanical Turk — as well as the first attempt at an account of it. The account has two crucial ingredients: first, bound pronouns optionally enter the derivation with unvalued phi-features (cf. Kratzer 1998a, 2009;

Rullmann 2004; Heim 2008; Landau 2016). Second, phases are defined in part by convergence, so that under certain conditions, an unvalued feature voids the otherwise phasal status of CP (cf. Chomsky 2000:107 and Felser 2004) and thereby extends the locality domain for syntactic relations.

The organization of the rest of the paper is as follows. In section 2, we provide some background, situating the bound pronoun effect with respect to previous literature and to the broader landscape of clause-boundedness and related phenomena. In section 3, we lay out the core data that motivate our theoretical proposals and describe our experimental findings. In section 4, we present our phase-theoretic account of the bound pronoun effect and show how it can be embedded into existing formulations of the Phase Impenetrability Condition so as to derive the crucial facts. In section 5, we offer some preliminary remarks on the bound pronoun effect as it relates to island phenomena. Finally, we conclude in section 6. An appendix lays out in greater detail the statistical analysis that we performed on our experimental results.

2 Some historical and empirical context

2.1 Clause-boundedness and the finite/nonfinite distinction

The idea that some syntactic processes and relations cannot cross a clause boundary has played a role in generative theorizing since the 1950s. (See Lasnik 2002 for an overview.) It has also long been observed that not all clause boundaries are created

equal: Chomsky's (1973) Tensed Sentence Condition and Specified Subject

Condition both acknowledge the relative weakness of nonfinite clause boundaries.

In a related vein, Postal (1974) uses the term "quasi-clause" (a coinage he attributes

to David Perlmutter) for raising and control complements, and he suggests that

quasi-clause boundaries are "not as strong a barrier to at least some syntactic

phenomena as full clause boundaries" (p. 232). Postal invokes quasi-clauses in

discussing a range of processes and relations including complex NP shift

(extraposition), comparative deletion, tough movement, multiple questions (cf. also

Kuno & Robinson 1972), and double negation (the latter obeying an "anti-clause-

mate" condition).

  Other phenomena for which clause-boundedness and the finite/nonfinite

distinction have since been found to be relevant include reciprocal binding

(Higginbotham 1981), slang NPI licensing (Lasnik 2002), multiple sluicing

(Nishigauchi 1998; Merchant 2001; Barrie 2008; Lasnik 2014), "family of questions"

readings of interrogative sentences that contain a universal quantifier (May 1977,

1985; Williams 1986; Sloan & Uriagereka 1988; Sloan 1991; Lasnik 2006; Agüero-

Bautista 2007), and ACD and quantifier scope interaction (May 1985; Larson & May

1990; Hornstein 1994; Farkas & Giannakidou 1996; Kennedy 1997; Wilder 1997;

Kayne 1998; Fox 2000; Cecchetto 2004; Moulton 2008; Hackl, Koster-Hale &

Varvoutis 2012; Wurmbrand 2013, 2015a).

2.2 Complication One: Restructuring

For some phenomena, not all authors claim that the relevant distinction is simply between finite clauses and nonfinite clauses. One trend in the literature builds on Rizzi's (1978) seminal work on Italian, where clitic climbing and related phenomena are shown to be ordinarily clause-bound except in some but not all sentences involving nonfinite complementation. Crucially, Rizzi showed that the availability of clitic climbing across a nonfinite clause boundary is conditioned by the choice of the embedding verb, generalizing that only modal, motion, and aspectual verbs extend locality.[4] There is now a sizeable literature on restructuring that corroborates versions of this claim for analogous effects in Spanish (Aissen & Perlmutter 1983), German (Wurmbrand 2001 and Lee-Schoenfeld 2007), and potentially a much wider range of languages as well (Cinque 2004; Grano 2015; Wurmbrand 2015b).

Drawing on this tradition and building also on Johnson (1996), Lechner (2001) claims that gapping and comparative deletion in English only apply across nonfinite clause boundaries if the embedding verb is a restructuring verb. Hornstein (1994) makes the same claim for quantifier scope interaction and ACD, although this view is questioned by Kennedy (1997) and Wurmbrand (2013); see also Moulton 2008 for relevant experimental work on inverse scope. Another phenomenon for which restructuring has been invoked in English is infinitival *to* contraction in locutions like *wanna* (from *want to*) or *hafta* (from *have to*): see Goodall 1991.[5]

2.3 Complication Two: The Bound Pronoun Effect

The bound pronoun effect investigated in this paper constitutes yet another challenge to the characterization of locality domains in terms of a simple finite/nonfinite contrast: just as the restructuring literature has shown that not all nonfinite clauses are created equal, the bound pronoun effects shows that not all finite clauses are created equal. As mentioned in note 3 above, various scholars have observed the bound pronoun effect as it pertains to particular phenomena (Sloan 1991; Nishigauchi 1998; Merchant 2001; Lasnik 2006, 2014; Syrett & Lidz 2011), but the full range of data bearing on the effect has yet to be systematically documented and accounted for. We now turn our attention to this.

3 The data

In this section, we lay out the data that will inform our analysis in section 4 below. We begin by documenting the range of phenomena that exhibit the bound pronoun effect (section 3.1). We then show that the effect is subject-oriented (only bound pronouns that are in subject position induce the effect) (section 3.2) and that non-bound pronouns do not induce the effect (section 3.3). We then present our experimental findings that confirm these observations (section 3.4) and make explicit our hypothesis about how the observed contrasts in acceptability map onto the grammaticality cuts made by the account we pursue (section 3.5).

3.1 The range of phenomena that exhibit the bound pronoun effect

In (1)-(4) above, we illustrated the bound pronoun effect for six phenomena: *too/enough* movement, gapping, comparative deletion, ACD, inverse scope, and multiple questions. Here we illustrate the effect for six additional phenomena, namely, pseudogapping, reciprocal binding, multiple sluicing, "family of questions" readings, extraposition, and tough movement. Baseline monoclausal examples are illustrated in the bracketed portions of (5a-f) respectively. As with the other six phenomena, we see degraded acceptability when the bracketed portion of the sentence includes a finite clause boundary (6), substantial improvement when the embedded clause is a nonfinite clause introduced by a control or raising verb (7), and moderate improvement when the embedded finite clause has a bound pronominal subject (8).

(5)   a. John likes apples and [Bill does <~~like~~> oranges].

b. [**John and Bill** like **each other**.]

c. Someone is worried about something but I don't know [who <~~is worried~~> about what].

d. [Which journal does everyone read __]?

Anticipated answer type: John reads *LI*, Bill reads *NLLT*, etc.

e. [John reads __ very carefully] — all the major linguistics journals.

f. This book is easy [for John to read ___].

(6) a. *John claims that Mark likes apples and [Bill does ~~claim that Mark likes~~

oranges].

b. *[**John and Bill** claim that Mark likes **each other**].

   Intended reading: John claims that Mark likes Bill and Bill claims that

   Mark likes John.

c. *Someone claims that John is worried about something but I don't know

   [who ~~claims that John is worried~~ about what].

d. *[Which journal does everyone claim that John reads __]?

   Anticipated answer type: Bill claims that John reads *LI*, Tim claims that

   John reads *NLLT*, etc.

e. *[John claims that Bill reads __ every time I ask about it] — all the

   major linguistics journals.

f. *This book is easy [for John to claim that Bill read ___].

(7) a. John claims/tends to like apples and [Bill does ~~claim/tend to like~~

oranges].

b. [**John and Bill** claim/tend to like **each other**].

   Intended reading: John claims/tends to like Bill and Bill claims/tends to

   like John.

c. Someone claims/tends to be worried about something but I don't know

   [who ~~claims/tends to be worried~~ about what].

d. [Which journal does everyone claim/tend to read __]?

   Anticipated answer type: John claims/tends to read *LI*, Bill claims/tends to

read *NLLT*, etc.

e. [John claims/tends to read __ every time I ask about it] — all the major

linguistics journals.

f. This book is easy [for John to {claim to have read __ / tend to read __}].

(8)   a. ?John$_1$ claims that **he$_1$** likes apples and [Bill$_2$ does ~~claim that **he$_2$** likes~~

oranges].

b. ?[[**John and Bill**]$_1$ claim that **they$_1$** like **each other**].

Intended reading: John$_1$ claims that he$_1$ likes Bill and Bill$_2$ claims that he$_2$

likes John.

c. ?Someone$_1$ claims that **they$_1$** are worried about something but I don't

know [who$_2$ ~~claims that they$_2$ are worried~~ about what].

d. ?[Which journal does everyone$_1$ claim that **they$_1$** read __]?

e. ?[John$_1$ claims that **he$_1$** reads __ every time I ask about it] — all the

major linguistics journals.

f. ?This book is easy [for John$_1$ to claim that **he$_1$** read].

The twelve phenomena exemplified in (1)-(4) of the introduction and (5)-(8) here

constitute what we consider the core cases of the bound pronoun effect for the

purpose of this paper, but see also section 5 below for a preliminary discussion of

the bound pronoun effect as it pertains to island phenomena.[6]

3.2 Subject orientation

In this and the next subsection we discuss in turn two dimensions of the bound

pronoun effect that we take to be crucial in developing our account of it: the subject

orientation of the effect and the fact that there is no comparable "non-bound

pronoun effect".

By subject orientation, we mean that only bound pronouns that are in subject

position give rise to the bound pronoun effect. This is illustrated in (9)-(13) for

too/enough movement, multiple questions, and comparative deletion, respectively.

(Although we believe subject orientation holds for all the relevant phenomena, we

restrict our attention here just to these three cases for reasons of space.) (9) shows

the baseline monoclausal examples, (10) shows the minimal variants with finite

clause boundaries and no bound pronoun, and (11) shows the bound pronoun effect

for subject-position bound pronouns. Crucially, what we see in (12) is that a bound

pronoun in a position lower in the clause than subject position does not have the

same acceptability-boosting effect as does a bound pronoun in subject position. In a

similar vein, (13) shows that the bound pronoun effect is also not operative for

subject-internal bound possessors: from this we conclude that the bound pronoun

has to be the *entire* subject of the relevant clause in order for the effect to be

operative. See section 3.4 below for experimental documentation of the cline of

acceptability implied by the judgment marks we use in (9)-(13): sentences like (9)

are more acceptable than sentences like (11) which are in turn more acceptable

than sentences like (10), (12), and (13).[7]

(9)   a. This book is too valuable [for James to lend __ to Bill].

         b. Sandy wondered [**which man** bought George **which shirt**].

         c. More teachers gave the students pencils than [~~gave the students~~ pens].

(10)   a. *This book is too valuable [for James to claim that Mark lent __ to Bill].

         b. *Sandy wondered [**which man** claimed that James bought George **which shirt**].

         c. *More teachers claimed that the principal gave the students pencils than [~~claimed that the principal gave the students~~ pens].

(11)   a. ?This book is too valuable [for James$_1$ to claim that **he$_1$** lent __ to Bill].

         b. ?Sandy wondered [**which man$_1$** claimed that **he$_1$** bought George **which shirt**].

         c. ?More teachers$_1$ claimed that **they$_1$** gave the students pencils than [~~claimed that **they$_1$** gave the students~~ pens].

(12)   a. *This book is too valuable [for James$_1$ to claim that Bill lent __ to **him$_1$**].

         b. *Sandy wondered [**which man$_1$** claimed that Bill bought **him$_1$ which shirt**].

         c. *More teachers$_1$ claimed that the principal gave **them$_1$** pencils than [~~claimed that the principal gave **them$_1$**~~ pens].

(13) a. *This book is too valuable [for James$_1$ to claim that **his$_1$** father lent __ to

Maria].

b. *Sandy wondered [**which man**$_1$ claimed that **his$_1$** father bought George

which shirt].

c. *More teachers$_1$ claimed that **their$_1$** assistants gave the students pencils

than [~~claimed that **their$_1$** assistants gave the students~~ pens].

3.3 Non-bound pronouns

In (14)-(16), we see that the bound pronoun effect goes away if the relevant

pronoun is not bound, that is, if the pronoun is a free third-person pronoun (14), a

first-person pronoun (15), or a second-person pronoun (16). Although our

experimental investigation discussed in section 3.4 below does not include

sentences with free third-person pronouns like (14), it does include sentences with

first- and second-person pronouns like (15)-(16), and the results are consistent

with the view that sentences like (15)-(16) are indeed no more acceptable than the

corresponding variants in (10) above that have full lexical subjects.

(14) a. *This book is too valuable [for James$_1$ to claim that **she$_2$** lent __ to Bill].

b. *Sandy wondered [**which man**$_1$ claimed that **she$_2$** bought George **which**

shirt].

c. *More teachers$_1$ claimed that **she$_2$** gave the students pencils than [~~claimed~~

~~that **she$_2$** gave the students~~ pens].

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(15) a. *This book is too valuable [for James$_1$ to claim that **I** lent __ to Bill].

  b. *Sandy wondered [**which man**$_1$ claimed that **I** bought George **which shirt**].

  c. *More teachers$_1$ claimed that **I** gave the students pencils than [~~claimed that I gave the students~~ pens].

(16) a. *This book is too valuable [for James$_1$ to claim that **you** lent __ to Bill].

  b. *Sandy wondered [**which man**$_1$ claimed that **you** bought George **which shirt**].

  c. *More teachers$_1$ claimed that **you** gave the students pencils than [~~claimed that **you** gave the students~~ pens].

The absence of the effect for first- and second-person pronouns as seen in (15)-(16) is particularly important because it speaks against an alternative characterization of the bound pronoun effect that would lend itself to an account substantially different from what we propose below. In particular, Syrett & Lidz (2011), noting the degraded status of ACD across a finite clause boundary and the ameliorating effect of a bound pronoun, speculate that the facts could be due to "the extra processing load introduced by the interpretation of Tense and a new discourse referent in the subject of the embedded clause" (p. 330). In other words, on this view, what is crucial about bound pronouns is that they do not introduce a new discourse referent and hence lead to easier processing of dependencies that span

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them. Similarly, Jason Merchant (pers. comm.), reporting on discussion with Ivan

Sag, suggests the possibility that the bound pronoun effect is not really about the

bound status of the pronoun *per se* but rather about accessibility in the sense of

Ariel (1988): roughly, the easier it is to resolve the understood referent of the

pronoun, the more innocuous the clause boundary is to the phenomena in question.

Consistent with this suggestion, Merchant reports that Sag's linguistic intuition was

that first- and second-person pronouns were just as effective as bound pronouns in

ameliorating finite clause boundaries in phenomena such as gapping. In yet another

related vein, an anonymous reviewer claims that speakers find gapping across a

finite clause boundary to be just as acceptable with a free pronoun as it is with a

bound pronoun in examples like (17). Crucially in (17) there is a discourse-salient

antecedent for the relevant pronoun and hence (17) is consistent with the Syrett-

Lidz-Sag-Merchant line of reasoning.

(17) a. What did they say about Bill's preferences?

    b.?Joe claims that he likes apples better, and Tim <~~claims that he likes~~> oranges.

        Insofar as discourse participants are always salient or accessible in the

relevant sense, we take our experimental findings concerning first- and second-

person pronominal subjects as evidence against the view that the bound pronoun

effect is subsumed under a more general accessibility or discourse-salience effect.

That being said, we do not mean to deny the possibility that accessibility or

something like it could exist as an independent factor that affects acceptability

ratings for the kinds of sentences in question. We leave a full investigation of this issue to future work.

3.4 An experimental investigation of the bound pronoun effect

Here, we report on two sentence acceptability experiments designed using the tools described in Erlewine & Kotek (2016) and conducted via Amazon's Mechanical Turk. The protocol for the experiments described here was granted Exempt status by the [REDACTED] Human Subjects Office on June 9, 2016 (Protocol #1605885354, 'An experimental investigation of the bound pronoun effect', [REDACTED], PI). In what follows, we discuss in turn the construction of stimuli (section 3.4.1), recruitment of participants and experimental apparatus (section 3.4.2), results (section 3.4.3), and summary of the statistical analysis (section 3.4.4). The complete details associated with the statistical analysis are supplied in the appendix.

3.4.1 Construction of stimuli

We targeted three phenomena for investigation: multiple questions, *too/enough* movement, and comparative deletion. One of the reasons for choosing these three particular phenomena is that, unlike what happens with some of the other phenomena, there is no need to control for the availability of uncontroversially grammatical but irrelevant parses of some of the target sentences. For example, the degraded instances of inverse scope, ACD, and gapping in (18) are surface-string

identical to the respective grammatical parses in (19). By contrast, the strings

associated with the degraded instances of multiple questions, *too/enough*

movement, and comparative deletion in (20) have no alternative uncontroversially

grammatical parse.

(18)   a. *[**At least one professor** claims that Bill reads **every journal**]. (∀>∃)

    b. *John claims that Mark reads everything [Bill does <~~claims that Mark~~

      ~~reads~~>].

    c. *John claims that Mark likes apples and [Bill <~~claims that Mark likes~~>

      oranges].

(19)   a. [**At least one professor** claims that Bill reads **every journal**]. (∃>∀)

    b. John claims that Mark reads everything [Bill does ~~read~~>].

    c. John claims that Mark likes apples and [Bill <~~likes~~> oranges].

(20)   a. *Sandy wondered [**which man** claimed that James bought George **which**

      shirt].

    b. *This book is too valuable [for James to claim that Mark lent __ to Bill].

    c. *More teachers claimed that the principal gave the students pencils than

      [~~claimed that the principal gave the students~~ pens].

For each of the 3 targeted phenomena, we constructed 5 baseline sentences in which the relevant dependency occurs in a monoclausal frame, yielding a total of 15 sentences, shown in (21)-(23).

(21) BaseLine (Multiple questions)

a. Sandy wondered which man bought George which shirt.

b. Kim doesn't remember which man lent Jill which magazine.

c. Abby found out which man told Barry which joke.

d. Mary asked which man sent Fred which letter.

e. Mark discovered which man threw Bobby which ball.

(22) BaseLine (*too/enough* movement)

a. This book is too valuable for James to lend to Maria.

b. This ball is too heavy for Linda to throw at Brian.

c. This joke is too inappropriate for Paul to tell to Steve.

d. This shirt is too expensive for Barbara to buy for Mike.

e. This letter is too outrageous for Jennifer to send to Susie.

(23) BaseLine (Comparative deletion)

a. More teachers gave the students pencils than pens.

b. More politicians sent the voters postcards than letters.

c. More employees told the boss stories than jokes.

d. More authors sent the publisher novels than short stories.

e. More people bought Jake shoes than socks.

For each these 15 baseline sentences, we constructed 10 variants that involve a biclausal configuration at the crucial site. 5 of the 10 variants use *claim* as the embedding verb and the other 5 use *promise*. Each group of 5 represents the 5 crucial conditions tested in Experiment 1: a nonfinite clause boundary, a finite clause boundary with a bound subject, a finite clause boundary with a bound (prepositional) object, a finite clause boundary with a bound subject-internal possessor, and a finite clause boundary with no bound pronoun. For example, the 10 variants constructed around the baseline sentence in (22a) are as given in (24)-(25).[8]

(24)   Embedding verb = *claim*

a. NonFinite

   This book is too valuable for James to claim to have lent to Maria.

b. BoundSubj

   This book is too valuable for James to claim that he lent to Maria.

c. BoundObj

   This book is too valuable for James to claim that Maria lent to him.

d. BoundPoss

   This book is too valuable for James to claim that his father lent to Maria.

e. NoBinding

   This book is too valuable for James to claim that Karen lent to Maria.

(25)   Embedding verb = *promise*

a. NonFinite

This book is too valuable for James to promise to lend to Maria.

b. BoundSubj

This book is too valuable for James to promise that he will lend to Maria.

c. BoundObj

This book is too valuable for James to promise that Maria will lend to him.

d. BoundPoss

This movie is too valuable for James to promise that his father will lend to Maria.

e. NoBinding

This book is too valuable for James to promise that Bill will lend to Maria.

3 phenomena X 5 sentence frames X (1 baseline condition + [5 non-baseline conditions X 2 embedding verbs]) yields a total of 165 test sentences. We used these 165 sentences to create 75 lists in such a way that each list contains 33 test sentences, each test sentence appears on 15 lists, and no list contains 2 non-baseline test sentences that instantiate the same phenomenon and that vary along only one factor (the relevant factors being sentence frame, condition, and embedding verb). Using Erlewine & Kotek's (2016) Turktools software (available at http://turktools.net), each list was separately randomized and interspersed with 33

filler sentences of varying degrees of acceptability and of complexity similar to that of the test sentences.

For the second experiment, the construction of stimuli and lists was identical to that for the first experiment, except that the BoundObj and BoundPoss conditions were replaced by conditions in which the finite embedded clause contained no bound pronoun but instead contained a first-person singular pronominal subject and a second-person pronominal subject, respectively. For example, (24c-d)/(25c-d) from above were replaced with (26a-b)-(27a-b), respectively.

(26)   a. 1pSubj

            This book is too valuable for James to claim that **I** lent to Maria.

        b. 2pSubj

            This book is too valuable for James to claim that **you** lent to Maria.

(27)   a. 1pSubj

            This book is too valuable for James to promise that **I** will lend to Maria.

        b. 2pSubj

            This book is too valuable for James to promise that **you** will lend to Maria.

3.4.2 Recruitment of participants and experimental apparatus

75 experimental participants were recruited via Amazon's Mechanical Turk, so that each of the 75 lists was seen by one participant. Participants were required to be

native speakers of American English at least 18 years of age and residing in the United States. Participants were asked to rate each sentence on a scale of 1 (least acceptable) to 7 (most acceptable), where an "acceptable" sentence was defined in the instructions as "something that a native speaker of English would say, even if the situation the sentence describes sounds implausible".[9]

75 participants who had not participated in Experiment 1 were recruited to participate in Experiment 2. Recruitment and instructions were otherwise identical to those for Experiment 1.

3.4.3 Results

The results of Experiment 1 are shown in Table 1, which indicates the raw distribution of each rating for each of the crucial conditions as instantiated by each of the three phenomena tested.

RATING	Comparative Deletion						Multiple Questions						*too/enough* Movement					
	BL	NF	BS	BO	BP	NB	BL	NF	BS	BO	BP	NB	BL	NF	BS	BO	BP	NB
1	1	7	6	12	12	10	3	8	21	24	25	22	1	5	8	18	27	20
2	2	10	12	23	19	14	3	14	32	30	30	32	0	12	17	30	17	30
3	3	12	21	16	26	34	7	14	33	31	35	30	3	15	22	32	40	35
4	7	15	14	22	25	21	4	28	19	25	20	19	1	19	21	19	25	15
5	10	24	28	27	17	34	18	39	20	23	22	23	7	33	32	28	24	27
6	20	35	42	25	37	25	29	36	19	15	13	21	16	42	33	15	11	18
7	32	47	27	25	14	12	11	11	6	2	5	3	47	24	17	8	6	5
TOTAL	75	150	150	150	150	150	75	150	150	150	150	150	75	150	150	150	150	150

Table 1: Experiment 1 Results

Key: BL = BaseLine; NF = NonFinite; BS = BoundSubj;

BO = BoundObj; BP = BoundPoss; NB = NoBinding

The results of Experiment 2 are shown in Table 2.[10]

RATING	Comparative Deletion						Multiple Questions						too/enough Movement					
	BL	NF	BS	1P	2P	NB	BL	NF	BS	1P	2P	NB	BL	NF	BS	1P	2P	NB
1	3	5	5	15	17	10	2	6	18	29	30	24	0	7	9	20	23	22
2	4	6	6	26	26	24	7	9	23	32	38	30	2	11	25	34	28	28
3	5	16	21	29	22	29	8	30	38	27	32	30	2	18	23	26	25	33
4	7	25	28	20	34	22	12	29	29	28	22	25	2	17	23	25	23	23
5	11	23	26	22	16	38	15	33	28	23	21	25	11	32	30	20	32	27
6	14	39	44	26	24	18	17	30	10	9	5	14	8	35	27	17	15	13
7	31	36	20	11	9	9	14	13	4	2	2	2	50	30	13	8	4	4
TOTAL	75	150	150	149	148	150	75	150	150	150	150	150	75	150	150	150	150	150

Table 2: Experiment 2 Results

Key: BL = BaseLine; NF = NonFinite; BS = BoundSubj;

1P = 1pSubj; 2P = 2pSubj; NB = NoBinding

3.4.4 Summary of statistical analysis

Statistical analysis was performed in IBM SPSS Statistics Version 24. As described in greater detail in the Appendix, an Independent-Samples Kruskal-Wallis Test, when applied to the results of Experiment 1, indicates that the distribution of ratings is *not* the same across the different conditions ($X^2(5)$ = 325.701 , $p < 0.01$). More specifically, pairwise comparisons show that each condition gives rise to a rating profile that is significantly different from each other condition ($p < 0.01$), except for the BoundPoss, BoundObj, and NoBinding conditions, which are not significantly different from one another (p = 1). As schematized in (28), BaseLine sentences were rated as most acceptable (Mean Rank = 1841.69), followed by sentences with a

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nonfinite embedded clause (Mean Rank = 1494.58), followed by sentences with a

finite embedded clause containing a bound pronominal subject (Mean Rank =

1258.58). At the low end of the acceptability scale are sentences with an embedded

finite clause containing a bound pronominal object (Mean Rank = 1064.88), a bound

subject-internal possessor (Mean Rank = 1024.02), or no bound pronoun at all

(Mean Rank = 1046.09). These latter three conditions give rise to ratings that are

not significantly different from one another.

(28) BaseLine > NonFinite > BoundSubj > {BoundObj = BoundPoss = NoBinding}

Applied to the results of Experiment 2, the Independent-Samples Kruskal-

Wallis Test similarly shows that the distribution of ratings is *not* the same across the

different conditions ($X^2(5)$ = 349.406 , p < 0.01). Pairwise comparisons show that

each condition gives rise to a rating profile that is significantly different from each

other condition (p < 0.01), except for the 1pSubj, 2pSubj, and NoBinding conditions,

which are not significantly different from one another (p = 1). As schematized in

(29), BaseLine sentences were rated as most acceptable (Mean Rank = 1802.87),

followed by sentences with a nonfinite embedded clause (Mean Rank = 1534.98),

followed by sentences with a finite embedded clause containing a bound

pronominal subject (Mean Rank = 1285.35). At the low end of the acceptability scale

are sentences with an embedded finite clause containing a first-person pronominal

subject (Mean Rank = 1030.64), a second-person pronominal subject (Mean Rank =

992.41), or no pronoun at all (Mean Rank = 1054.39). These latter three conditions give rise to ratings that are not significantly different from one another.

(29) BaseLine > Nonfinite > BoundSubj > {1pSubj = 2pSubj = NoBinding}

Taken together, the two experiments support the conclusion that the bound pronoun effect is real (Experiments 1 and 2), that it is subject-oriented (Experiment 1), and that no comparable effect holds for first- or second-person pronominal subjects (Experiment 2). For more details concerning the results of the Kruskal-Wallis Test, as well as independent confirmation of the core results using a more powerful statistical technique (in particular, a Generalized Estimating Equations analysis), see the Appendix.

3.5 The relationship between the data we observe and the theory we pursue

The goal for the rest of this paper is to develop a theory that treats the BaseLine, NonFinite, and BoundSubj sentences as grammatical to the exclusion of the BoundObj, BoundPoss, 1pSubj, 2pSubj, and NoBinding sentences, as summarized in (30).

(30) Summary of the grammaticality cuts made by the theory we pursue
    a. Grammatical: BaseLine, NonFinite, BoundSubj
    b. Ungrammatical: BoundObj, BoundPoss, 1pSubj, 2pSubj, NoBinding

We pursue a theory that makes these particular cuts in grammaticality not because we think that these cuts can be read directly off the data (obviously, data cannot tell us what is grammatical, only what is more or less acceptable) but rather because these cuts are consistent both with the observed cline of acceptability and with an independently plausible theory of phases and of phi-feature valuation on bound pronouns.

To be sure, (30) is only one of many conceivable ways of constructing a theory that is consistent with the observed data, and we leave it to future work to pursue other possibilities.[11] One matter in particular that our theory will not have anything to say about is why, among those sentence types that our theory treats as grammatical, there is a cline of acceptability that can be characterized as: BaseLine > NonFinite > BoundSubj. But we would like to say a few words about this cline, before confining ourselves in the remainder of the paper to building a theory that derives (30). In particular, we think it is plausible that the BaseLine > NonFinite > BoundSubj cline reflects differences in processing cost. There is some precedent for the idea that acceptability judgments are affected by factors concerning the material in between two elements involved in a dependency, even when the hypothesized grammaticality of the dependency is held constant. For example, Pickering & Barry (1991) argue that the distance between a gap and its filler affects acceptability. In a similar vein, Kluender & Kutas (1993) argue that *wh*-movement across a clause boundary incurs a processing cost, and Sprouse, Wagers & Phillips (2012) show that *wh*-dependencies that cross a finite clause boundary are indeed somewhat less

acceptable than ones that do not. Finally, McElree, Foraker & Dyer (2003) show that accuracy in rejecting ungrammatical dependencies decreases with the number of intervening clauses. There are still many open questions here: it is not clear whether the effects documented in these works reflect processing costs associated with clause boundaries in particular or with more general factors such as length or time. But in any event, we take these works to reinforce the plausibility of viewing the BaseLine > NonFinite > BoundSubj cline as reflecting differing processing costs among grammatical sentences rather than reflecting cuts in grammaticality.

4 A phase-theoretic account of the bound pronoun effect

4.1 The account in a nutshell

An attractive first approximation of an account of the bound pronoun effect would take the basic shape in (31). If the locality domain for the phenomena of interest is the phase, and bound pronouns enter the derivation in a way that voids the otherwise phasal status of the complement clause, then the bound pronoun effect falls out.

(31) Account of the bound pronoun effect (version 1 of 3)
    a. Unvalued phi-features void phasehood.
    b. The locality domain for the phenomena that give rise to the bound
       pronoun effect is the phase.

c. Bound pronouns enter the derivation with unvalued phi-features.[12]

But as it stands, (31) overgenerates. As schematized informally in (32), although it accurately predicts the cut between finite clauses with no bound pronoun (32a) and finite clauses with a bound pronominal subject (32b), it also incorrectly rules in cases where the relevant finite clause has a bound pronoun somewhere other than subject position (32c-d).

(32) Predictions of the account in (31)

    a. The book is too dear [for Jim to claim [$_{PHASE}$ that Mark lent __ to Bill]].

      →*correctly ruled out*

    b. The book is too dear [for Jim$_1$ to claim [$_{NON-PHASE}$ that **he$_1$** lent __ to Bill].

      →*correctly ruled in*

    c. The book is too dear [for Jim$_1$ to claim [$_{NON-PHASE}$ that Bill lent __ to **him$_1$**]].

      →*incorrectly ruled in*

    d. The book is too dear [for Jim$_1$ to claim [$_{NON-PHASE}$ that **his$_1$** dad lent __ to Bill]].

      →*incorrectly ruled in*

To remedy this, we propose a modification to (31) (and we are grateful for Hisa Kitahara for suggesting this approach to us):

(33)   Account of the bound pronoun effect (version 2 of 3)

    a. Unvalued features *on the head of the complement to the phase head* keep

the phase open.

    b. The locality domain for the phenomena that give rise to the bound

      pronoun effect is the phase.

    c. Bound pronouns enter the derivation with unvalued phi-features.

By (33), it will not do to have an unvalued feature just anywhere in the candidate

phase; rather, the unvalued feature must be sufficiently close to the edge of the

phase, more specifically, on the head of the complement to the phase head. The

crucial property of the subject position, on this view, is that the phi-features of the

subject value the phi-features on T (subject-verb agreement). So if the subject's phi-

features are unvalued, then the agreeing phi-features on T are necessarily also

unvalued. And T is the head of the complement to the phase head C. As schematized

in (34), this revised account makes all the right cuts.

(34) Predictions of the account in (33)

    a. The book is too dear [for Jim to claim [$_{PHASE}$ that Mark lent __ to Bill]].

      →*correctly ruled out*

    b. The book is too dear [for Jim_1 to claim [$_{NON-PHASE}$ that **he_1** lent __ to Bill].

      →*correctly ruled in*

    c. The book is too dear [for Jim_1 to claim [$_{PHASE}$ that Bill lent __ to **him_1**]].

      →*correctly ruled out*

    d. The book is too dear [for Jim_1 to claim [$_{PHASE}$ that **his_1** dad lent __ to Bill]].

      →*correctly ruled out*

But we are still not quite done yet, because although (33) makes the right

predictions for the sentences of interest, it also severely undergenerates when it

comes to more basic sentences. In particular, we want to make sure that in principle

(when no phase-bound dependencies are at stake), a bound pronoun can be

arbitrarily distant from its antecedent, as in (35). But if bound pronouns obligatorily

enter the derivation with unvalued phi-features and if these phi-features are

eventually valued when the antecedent is merged in, the simplest view would be

that this valuation procedure is itself phase-bound. And then we incorrectly rule out

(35).

(35) John$_1$ said [$_{PHASE}$ that Mary thought [$_{PHASE}$ that Kim saw him$_1$]].

So we propose one final revision to our account:

(36)   Account of the bound pronoun effect (version 3 of 3)

a. Unvalued features on the head of the complement to the phase head keep

the phase open.

b. The locality domain for the phenomena that give rise to the bound

pronoun effect is the phase.

c. Bound pronouns *optionally* enter the derivation with unvalued phi-

features.

If bound pronouns have the option of entering the derivation with valued phi-features, then sentences like (35) have a licit derivation.

Having sketched the basic gist of our account, we now discuss each of the three ingredients in (36) in greater formal detail. In particular, we want to relate them to previous ideas in the literature, and we want to show that they can be successfully combined both with existing formulations of the Phase Impenetrability Condition and with more concrete assumptions about the syntax of the relevant phenomena.

4.2 Phasehood and feature valuation

Chomsky (2000:107) entertains two potential ways of defining phases:

(37)   a. Phases are propositional.

b. Phases are convergent.

For Chomsky, propositional objects are defined disjunctively as either "a verb phrase in which all θ-roles are assigned" (p. 106) (i.e., a *v*P) or "a full clause including tense and force" (p. 106) (i.e., a CP).[13] By contrast, a convergent object is one that it is legible at all interfaces (p. 95). So, one way in which an object could fail to be convergent would be to contain unvalued phi-features. The presence of unvalued phi-features would make the object illegible to the PF interface, since

these phi-features are needed to determine the morphological shape of the output form.

Theoretical parsimony favors the view that if either of these approaches to phasehood is correct, then it is complete in itself; i.e., a phrase XP is a phase *if and only if* it is propositional (on 37a) or *if and only if* it is convergent (on 37b). And indeed, Chomsky ultimately argues in favor of (37a) and against (37b). But the bound pronoun effect and its subject orientation leads us to entertain the view that propositionality and convergence *both* need to play a role in defining what a phase is.[14] In particular, we hypothesize that the locality domain for dependencies such as *too/enough* movement in (38) is violated *in virtue of* the CP status of the bracketed constituent *even though* that CP contains unvalued features (on the bound pronoun *him*), whereas the locality domain for *too/enough* movement is satisfied in (39) because *even though* the bracketed constituent is a CP, that CP contains unvalued features (on the bound pronoun *he*) that are in a sufficiently local configuration with the edge of the phase so as to keep the phase open.

(38) *This book is too valuable for James$_1$ to claim [that Bill lent __ to him$_1$].

(39) ?This book is too valuable for James$_1$ to claim [that he$_1$ lent __ to Bill].

What counts as "sufficiently local"? Suppose that a candidate phase does not count as a phase if the head of the complement to the head of the candidate phase contains unvalued features. Then, the contrast between (38) and (39) follows in virtue of the

fact that T is merged into the derivation with unvalued phi-features that are valued in agreement with the subject. In (38), the relevant T is valued by *Bill*, so the CP counts as a phase. In (39) by contrast, adopting the hypothesis that *he* enters the derivation with unvalued phi-features, the relevant T remains unvalued, so the CP does not count as a phase.

In the following subsection, we embed this idea into more concrete assumptions about how and why phases matter for the phenomena in question. Before doing this, though, we would like to briefly consider Chomsky's (2000) empirical argument against defining phases in terms of convergence and explain why it does not undermine the hybrid approach to phasehood that we propose. Chomsky's argument against the convergence approach goes as follows. First, Chomsky considers the contrast in acceptability between (40a) and (40b) and appeals to a "Merge over Move" principle to explain it: at the point in the derivation when embedded [Spec,TP] is built, the naïve expectation would be that the grammar can fill it either by raising *many linguists* or by merging in expletive *there* from the lexical array. But apparently, only the latter option yields a grammatical derivation, which follows if Merge over Move exists as a general principle.

(40)   a. There are likely [TP ~~there~~ to be many linguists at this conference].

b.*There are likely [TP many linguists to be ~~many linguists~~ at this conference].

But now consider (41). Here, at the point in the derivation when embedded [Spec,TP] is built, raising *many linguists* instead of merging in *there* yields a

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grammatical derivation, against the expectations of Merge over Move. This is not a problem, however, if we further assume that Merge over Move applies only over lexical subarrays, and lexical subarrays are organized into phases. If we further suppose that the embedded CP in (41) is a phase, then *there* is in a separate lexical subarray and is not eligible to be merged in at the relevant point in the derivation. Consequently, Move does not compete with it and the derivation goes through.

(41)   There is some likelihood [CP that [TP many linguists will be ~~many linguists~~ at this conference]].

But if this is right, then (42) is underivable on a convergence-based approach to phasehood, provided that *wh*-phrases enter the derivation with uninterpretable features: the uninterpretable feature on *which* should void the phasal status of the embedded CP. Consequently, given Merge over Move, *there* should be forced to merge in at [Spec,TP] of *will*. But evidently it is not so forced because this does not happen in (42) and yet (42) is grammatical. On the view that phases are defined as *vP* and CP, on the other hand, there is no problem deriving (42), since the embedded CP is phasal despite its uninterpretable feature, thereby preventing a situation wherein Merge over Move applies and forces premature merging of *there*.

(42)   Which conference is there some likelihood [CP that many linguists will be at ~~which conference~~]?

We have two things to say in response to Chomsky's argument. First, as pointed out by Felser (2004), the argument relies on the view that movement competes with merging of *there*. But, Felser points out, it could be that *there* is not a true expletive and hence that its merge site is constrained thematically by the choice of the predicate. In this case, it does not compete with movement, and so the argument does not go through. Second, even if we assume for the sake of argument that *there* is a true expletive, our hybrid approach to phases is immune to Chomsky's argument, because in (42), the uninterpretable feature on *which* has no bearing on the status of T. The T head of the embedded CP is fully valued, thereby ensuring the phasal status of CP. Consequently, *there* is not in the relevant lexical sub-array, so Merge over Move does not prevent raising of *many linguists*, and the derivation is successful.

4.3 Phases as locality domains

In (43), we list all of the phenomena that were shown in sections 1 and 2 to give rise to the bound pronoun effect.

(43)   a. *too/enough* movement

   b. gapping

   c. comparative deletion

   d. ACD

   e. quantifier scope interaction

f. multiple questions

g. pseudogapping

h. reciprocal binding

i. multiple sluicing

j. family of questions

k. extraposition

l. tough movement

Each of these phenomena has inspired a literature much too vast to do justice to here. But one consistent theme emerges: all of these phenomena have been argued to involve some kind of movement dependency. See, among many, many others: Chomsky 1977 on *too/enough* movement and tough movement; Pesetsky 1982 on gapping; Kennedy 2002 on comparative deletion; May 1985, Hornstein 1994 and Kennedy 1997 on ACD and quantifier scope interaction; Saito 1994 and Kotek 2014 on multiple questions; Lasnik 2002 and Gengel 2013 on pseudogapping; Heim, Lasnik & May 1991 on reciprocal binding; Lasnik 2014 on multiple sluicing and extraposition, and Lasnik & Saito 1992 on family of questions.

We take it that the movement dependencies involved in the phenomena in (43) are subject to phase-theoretic locality constraints; more specifically, for concreteness, we assume that some version of Chomsky's (2000, 2001) Phase Impenetrability Condition (PIC) as depicted in (44) holds. Chomsky (2001) entertains two variants of the PIC, one wherein the complement to a phase head H becomes inaccessible to subsequent syntactic operations as soon as HP is built (the

so-called strong PIC) and one wherein the complement to H becomes inaccessible once the phrase headed by the next highest phase head is built (the so-called weak PIC). For an overview of many of the issues at stake in deciding between the two variants, see Citko (2014); we will ultimately conclude that the strong PIC makes for the best overall fit with our theoretical aims.

(44) Phase Impenetrability Condition

      The complement to a phase head H is not accessible to operations…

      a.   outside HP. (strong PIC)

      b.   at ZP (where ZP is headed by the next highest phase head) (weak PIC)[15]

                         (adapted from Chomsky 2001:13-14)

      What counts as a phase head? In line with the proposal from the previous subsection, we define *phase head* as in (45).

(45) A head X is a *phase head* iff:

      a. X is a candidate phase head, and

      b. The head of the complement to X has no unvalued features.

What counts as a *candidate* phase head? We contrast two possibilities, stated in (46). On one view, candidate phase heads include at least C and *v*, whereas on the other view, candidate phase heads include at least C but not *v*. See Legate (2003) for

arguments in favor of the phasal status of *v* and den Dikken (2006) for a reply. The view that *v* is not a (candidate) phase head is admittedly nonstandard, but as it turns out, we will see below that this view fits the best with the rest of our assumptions to derive the bound pronoun effect. It will be beyond the scope of this paper to reconcile this conclusion with the arguments in the previous literature in favor of *v*'s phasal status, but see note 14 below for a suggestion. It also bears noting that since our concern here is with clausal syntax, we take no stance on what other kinds of categories, such as P or D, might also count as candidate phase heads; see Citko (2014) for discussion.

(46) Candidate phase heads include:

    a. Hypothesis a: at least C and *v*

    b. Hypothesis b: at least C but not *v*

Crossing the two variants of the PIC in (44) with the two hypotheses about the inventory of candidate phase heads in (46) yields the four theoretical possibilities listed in (47).

(47) a. **Strong** PIC; Candidate phase heads include **C and *v***

    b. **Strong** PIC; Candidate phase heads include **C but not *v***

    c. **Weak** PIC; Candidate phase heads include **C and *v***

    d. **Weak** PIC; Candidate phase heads include **C but not *v***

In what follows, we assess how successful each of the possibilities in (47) is in interacting with our other assumptions to derive the bound pronoun effect. For concreteness, we focus on *too/enough* movement, and consider two crucial syntactic configurations: one in which movement proceeds from a finite clause that does not contain a bound pronominal subject (which we want our theory to rule out) and one in which movement proceeds from a finite clause that contains a bound pronominal subject (which we want our theory to rule in). By way of preview, we will conclude that for *too/enough* movement, (47b) and (47d) succeed but (47a) and (47c) do not. We then consider how successful (47b) and (47d) are in scaling up to the other phenomena that exemplify the bound pronoun effect, ultimately concluding that (47b) yields the best fit with our data and theory.

Before proceeding, two notes are in order. First, we intend this exercise not as a forceful argument in favor of a particular formulation of the PIC but rather as a "proof of concept" that our phase-theoretic account of the bound pronoun effect and our view that phases are defined in part by convergence are compatible with some existing variants of the PIC. We are open to the possibility that there could be other variants of the PIC (or even other approaches to phases that do not rely on anything like the PIC) that would also interact with our other assumptions in a way that would derive the crucial facts. Second, we assume in what follows that the movement operations in question do not have the option of proceeding in a successive cyclic fashion: the element undergoing movement must immediately target its final landing site. We will return to and elaborate on this assumption after we walk through the derivations.

Consider first the *too/enough* movement structure in (48) that we want our theory to rule out. We assume that *too/enough* structures instantiate A-bar movement of an operator to [Spec,CP] of the complement to the embedding predicate (in this case, the embedding predicate is *valuable*). Prior to this movement, the bracketed portion of (48) has the structure indicated in (49).

(48) *This book is too valuable [for John to promise that Bill will buy ___].

(49) [$_{CP1}$ C$_1$ for [$_{TP}$ John T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ C$_2$ that [$_{TP}$ Bill T will [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]

The question that we now want to ask is: which of the four theoretical possibilities listed in (47) accurately rules out (48) by ensuring that movement of Op to [Spec,CP$_1$] in (49) induces a PIC violation? In what follows, we consider each possibility in turn.

 a. Strong PIC; Candidate phase heads include C and *v*: On this view, v_2 is a phase head and its complement becomes inaccessible as soon as vP_2 is complete. Therefore, Op cannot target [Spec,CP$_1$] and the derivation is correctly ruled out. We schematize this in (50), where |-----| indicates the portion of the structure that becomes inaccessible at the site indicated by the asterisk (*).

(50) [$_{CP1}$ **C$_1$** for [$_{TP}$ John [T to [$_{vP1}$ **v_1** [$_{VP}$ promise [$_{CP2}$ **C$_2$** that [$_{TP}$ Bill T will [$_{vP2}$ **v_2** [$_{VP}$ buy Op]]]]]]]]]]

                           * |----------|

b. Strong PIC; Candidate phase heads include C but not *v*: On this view, the first phase head encountered is C_2, the complement of which becomes inaccessible as soon as CP_2 is complete. As in the previous scenario, Op cannot target [Spec,CP_1] and the derivation is correctly ruled out. This is schematized in (51).

(51) [$_{CP1}$ **C$_1$** for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ **C$_2$** that [$_{TP}$ Bill T will [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]]
                                              * |------------------------------------|

c. Weak PIC; Candidate phase heads include C and *v*: On this view, v_2 is a phase head and its complement becomes inaccessible when the next highest phase head, namely C_2, is merged in. As schematized in (52), Op cannot target [Spec,CP_1] and the derivation is correctly ruled out.

(52) [$_{CP1}$ **C$_1$** for [$_{TP}$ John [T to [$_{vP1}$ **v_1** [$_{VP}$ promise [$_{CP2}$ **C$_2$** that [$_{TP}$ Bill T will [$_{vP2}$ **v_2** [$_{VP}$ buy Op]]]]]]]]]]
                                              * |------------|

d. Weak PIC; Candidate phase heads include C but not *v*: Finally, on the most permissive view, the first phase head encountered is C_2, and its complement becomes inaccessible once the next highest phase head, namely C_1, is merged in. As in the other three scenarios, Op cannot target [Spec,CP_1] and the derivation is correctly ruled out. This is schematized in (53).

(53) [$_{CP1}$ **C$_1$** for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ **C$_2$** that [$_{TP}$ Bill T will [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]]
        * |------------------------------------|

The interim conclusion, then, is that regardless of whether we adopt the strong or the weak version of the PIC and regardless of whether we count C and *v* or just *v* as candidate phase heads, (48) is correctly ruled out.

Consider now, by contrast, the *too/enough* movement sentence in (54), which instantiates the bound pronoun effect and which we want our theory to treat as grammatical; i.e., we want our theory to be able to derive it without incurring a PIC violation. The bracketed portion of (54) is as indicated in (55). The relevant parse is one in which the bound pronoun enters the derivation with unvalued phi-features, for which we use the notation "pro[ϕ:__]" in (55).

(54) ?This book is too valuable [for John to promise that he$_1$ will buy __].

(55) [$_{CP1}$ C$_1$ for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ C$_2$ that [$_{TP}$ pro[ϕ:__] T will [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]]

Similarly to what we did for the previous structure, what we now want to do is assess which of the theoretical options in (47) correctly predict that Op can target [Spec,CP$_1$] in (55) without incurring a PIC violation.

a. Strong PIC; Candidate phase heads include C and *v*: On this view, v_2 is a phase head, and its complement becomes inaccessible as soon as vP_2 is complete. Therefore Op cannot target [Spec,CP$_1$] and the structure is incorrectly ruled out. This is schematized in (56).

(56) [$_{CP1}$ **C$_1$** for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ C$_2$ that [$_{TP}$ pro[ϕ:__] T will [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]

                                                   * |-----------|

b. Strong PIC; Candidate phase heads include C but not v: Although C$_2$ is a *candidate* phase head, its status as an actual phase head is void here since the element sitting in the lower [Spec,TP] position, and by extension T itself, has unvalued features. Consequently, the first phase head encountered is C$_1$. Its complement becomes inaccessible once CP$_1$ is built, which is crucially late enough in the derivation for Op to target [Spec,CP$_1$]. As schematized in (57), the structure is correctly ruled in.

(57) [$_{CP1}$ **C$_1$** for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ C$_2$ that [$_{TP}$ pro[ϕ:__] T will [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]

      * |--|

c. Weak PIC; Candidate phase heads include C and v: On this view, the first phase encountered is v_2. Its complement becomes inaccessible as soon as v_1 is merged in. Therefore, Op cannot target [Spec,CP$_1$], and the structure is incorrectly ruled out. This is shown in (58).

(58) [$_{CP1}$ **C$_1$** for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ C$_2$ that [$_{TP}$ pro[ϕ:__] T will [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]

                          * |------------|

d. Weak PIC; Candidate phase heads include C but not *v*: On this view, the first actual phase head encountered is C_1, and its complement is spelled out as soon as the next highest phase head (call it C_0) is merged in. Consequently, Op can target [Spec,CP_1] and the structure is correctly ruled in, as schematized in (59).

(59) $\mathbf{C_0}$ ... [$_{CP1}$ $\mathbf{C_1}$ for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ C_2 that [$_{TP}$ pro[ϕ:__] T will [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]]

    * |---|

In summary, in order for the *too/enough* sentences that instantiate the bound pronoun effect to satisfy the PIC and be correctly ruled in, both the strong and the weak variants of the PIC are viable, but it must be the case that *v* is not a candidate phase head.[16]

It is also important to verify that our analysis correctly predicts that control and raising clauses extend locality. For control clauses, two analytical options are available. The first is to take the position that controlled subjects are instantiated by PRO and PRO is an unvalued pronoun, *à la* Kratzer 2009; Landau 2015, as in (60). Then, even if control clauses have all the same phasal properties as finite clauses, locality is extended in virtue of the same proposals that supported our analysis of the bound pronoun effect.

(60) [$_{CP1}$ $\mathbf{C_1}$ for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise [$_{CP2}$ $\mathbf{C_2}$ [$_{TP}$ PRO[[ϕ:__] T to [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]]]]

The other option for control clauses is to adopt the Movement Theory of Control

(see e.g. Hornstein 1999) whereby controlled subjects do not harbor unvalued

features but rather are the residue of movement. In that situation, it would have to

be the case that control clauses either lack C or have a non-phasal C in order to

ensure that locality is extended. This is sketched in (61). On this view, there is no

candidate phase head between Op and C_1, so we accurately predict that the relevant

movement dependency can be established.

(61) [$_{CP1}$ **C_1** for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ promise ([C_2)[$_{TP}$ ~~John~~ T to [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]

As for raising clauses, we adopt the standard view that they project only TP,

as in (62). As with the second of the two approaches to control clauses, this means

that there is no candidate phase head between Op and C_1, so we again accurately

predict that the relevant movement dependency can be established.

(62) [$_{CP1}$ **C_1** for [$_{TP}$ John [T to [$_{vP1}$ v_1 [$_{VP}$ tend [$_{TP}$ ~~John~~ T to [$_{vP2}$ v_2 [$_{VP}$ buy Op]]]]]]]]

The next question to address is: will the analysis sketched above for

too/enough movement extend straightforwardly to the other eleven phenomena

that we have identified as giving rise to the bound pronoun effect? Since these other

phenomena seem to pattern in exactly the same way with respect to the bound

pronoun effect, it is very tempting to try to account for them in the same way. At

least some of the phenomena fall in line straightforwardly with *too/enough*

movement since they also involve a movement operation that targets [Spec,CP]; these include tough movement and possibly also comparative deletion. As an anonymous reviewer points out to us, however, some of the other phenomena have been analyzed as involving a movement operation that targets some position below CP. Gengel (2013), for example, analyzes pseudogapping as movement of the remnant to a [Spec,FocP] position between TP and vP, so that the bracketed portion of (63) has a structure like (64).

(63) John likes apples and [Bill does ~~like~~ oranges].

(64) [$_{TP}$ Bill T does [$_{FocP}$ oranges$_1$ [$_{vP}$ v [$_{VP}$ ~~like~~ t$_1$]]]]

If this is right, then the success of the analysis we have just sketched in accurately predicting that (65) cannot be generated but (66) can depends on ensuring that in (67), *oranges* cannot target [Spec,FocP] whereas in (68) it can. Continuing to assume that v is not a (candidate) phase head, the weak PIC enables *oranges* to target [Spec,FocP] in (67); *oranges* is embedded in a CP that will not become inaccessible until the next phase head is merged in. The strong PIC, on the other hand, accurately rules out the movement in (67), since the CP that embeds *oranges* will become inaccessible as soon as CP is built, before FocP enters the derivation. Meanwhile, in (68), the bound pronoun voids the phasal status of C so that there are no phase heads between *oranges* and FocP, enabling movement.

(65) *John claims that Mary likes apples and [Bill does ~~claim that **Mary** likes~~] oranges].

(66) ?John$_1$ claims that he$_1$ likes apples and [Bill$_2$ does ~~claim that **he$_2$** likes~~] oranges].

(67) [$_{TP}$ Bill T does [$_{FocP}$ [$_{vP}$ v [$_{VP}$ claim [$_{CP}$ that [$_{TP}$ **Mary** [$_{vP}$ [$_{VP}$ likes oranges]]]]]]]]]

(68) [$_{TP}$ Bill T does [$_{FocP}$ [$_{vP}$ v [$_{VP}$ claim [$_{CP}$ that [$_{TP}$ **pro[φ:__]** [$_{vP}$ [$_{VP}$ likes oranges]]]]]]]]]

We therefore conclude that the phase-theoretic account sketched above for *too/enough* movement structures can be successfully extended to those phenomena that involve movement to a position lower than [Spec,CP], provided we adopt the strong rather than the weak variant of the PIC.

Finally, before moving on, an important question which we alluded to above and which still needs to be addressed is: since most, if not all, of the phenomena that instantiate the bound pronoun effect involve A-bar movement, why can't a long-distance dependency be established in accordance with the PIC via successive cyclic A-bar movement through intermediate [Spec,CP] positions, as is the case for ordinary *wh*-movement?[17] In fact, this is the opposite of what Felser (2004:547) calls *the triggering problem* for *wh*-movement:

(69) *The Triggering Problem:*

On the assumption that agreement (and hence, movement) is triggered by

matching but uninterpretable features of the probe, what triggers movement

of a *wh*-expression to the specifier of intermediate non-interrogative heads?

(Felser 2004:547)

Seen from this perspective, the real puzzle is not why *too/enough* movement and the

other phenomena that instantiate the bound pronoun effect disallow successive

cyclicity but rather why ordinary *wh*-movement as found in structures such as

interrogative and relative clauses *does* allow it. And this far-reaching puzzle is well

beyond the scope of this paper. But here is one potentially fruitful possibility to

explore. Suppose intermediate non-interrogative C heads have an optional *wh*-

feature that attracts *wh*-elements to [Spec,CP]. This is similar to Chomsky's (2000)

proposal that phase heads have an optional EPP feature. But if we instead treat the

relevant optional feature as a *wh*-feature, this provides a basis for distinguishing *wh*-

movement in the strict sense from other kinds of A-bar movement: successive

cyclicity is available for those elements undergoing A-bar movement that

themselves have matching *wh*-features, but it is not available for the kinds of

operators and phrases that undergo movement in the phenomena that trigger the

bound pronoun effect. This strikes us as a plausible avenue to pursue, though it

remains to be seen whether it is ultimately workable. One issue that would need to

be worked out is how it is determined whether a moved element has *wh*-features.

The existence of *wh*-features on the moved element in a *wh*-question is straightforward, as is the existence of such features on relative operators, given that they sometimes involve an overt *wh*-constituent. But topicalization seems to pattern like *wh*-questions and relative clause formation in being unbounded, despite the apparent absence of any independent evidence for *wh*-features on the moved element in topicalization. Another relevant consideration has to do with QR, which has been argued to allow for successive cyclic movement, albeit only when each step in the movement is semantically motivated (Fox 2000; Cecchetto 2004). Hence we leave this as an area for further investigation.[18]

4.4 Phi-features on bound pronouns

Finally, we revisit the last crucial piece of our proposal, namely that bound pronouns have the option of entering the derivation with unvalued phi-features. By way of background, consider a sentence like (70) on its bound variable interpretation. By what principle is (61) ruled in but the gender mismatched variant in (71) ruled out?

(70) Every man$_1$ thinks that he$_1$ is a genius.

(71) *Every man$_1$ thinks that she$_1$ is a genius.

In general there are two kinds of approaches that can be entertained. On one view, schematized in (72), a bound pronoun enters the derivation with unvalued phi-features (72a), and acquires those features via transmission from its binder at a later stage in the derivation (72b).[19] Since the binder in this case has masculine gender, the pronoun is ultimately spelled out as *he* rather than *she* (72c)*.* On this view, (71) is ruled out because it can never be generated in the first place. For various versions of this view, see Kratzer 1998a, 2009; Rullmann 2004; Heim 2008.[20]

(72) a. [Every man]$_{[\phi:3.sg.masc]}$ thinks that pro$_{[\phi:\_]}$ is a genius

b. [Every man]$_{[\phi:3.sg.masc]}$ thinks that pro$_{[\phi:3.sg.masc]}$ is a genius

|_____↑

c. pro$_{[\phi:3.sg.masc]}$ → he

On another view, bound pronouns enter the derivation with fully specified phi-features, so that a structure like (71) can in principle be built by the syntax. But it is deviant because it induces a presupposition failure. In particular, suppose that, just as is often assumed for free pronouns, phi-features on bound pronouns act as presuppositional filters that restrict the range of values that the variable denoted by the pronoun can take (see especially Cooper 1983 and Heim 2008). On this view, focusing just on gender features and ignoring person and number features, *she* has the denotation in (73).

(73) For any assignment function *g* and index *n*:

[[she_n]]^g is defined only if g(n) is female. Where defined, [[she_n]]^g = g(n)

<div align="right">(cf. Heim 2008:36)</div>

This presupposition projects up through the structure so that the matrix VP ends up denoting the partial function in (74) whose domain is restricted to the set of females.[21]

(74) [[1 t_1 thinks that she_1 is a genius]]^g = λx:x is female.x thinks that x is a genius

<div align="right">(cf. Heim 2008:38)</div>

Following Heim (2008:39) in assuming that *every* comes with its own presupposition, namely that the set associated with its NP argument is a subset of the domain associated with its VP argument, as in (75), the sentence in (71) ends up presupposing that all men are female, as in (76). This faulty presupposition then accounts for the perceived deviance of the sentence.

(75) [[every]] = λPλQ:{x: P(x) = 1} ⊆ dom(Q). {x: P(x) = 1} ⊆ {x: Q(x) = 1}

<div align="right">(Heim 2008:39)</div>

(76) [[Every man 1 t_1 thinks that she_1 is a genius]]^g is defined only if the set of men

is a subset of the set of females. Where defined, ...

As was the case for the two potential definitions of phases entertained in section 4.2 above (phases as propositional objects vs. phases as convergent objects), theoretical parsimony favors the view that if either of these approaches to bound pronouns is correct, it is correct in all cases and the other one is always incorrect. But as was the case with phases, we think that the bound pronoun effect points toward the view that both of these approaches are correct: in principle, pronouns have the option of entering the derivation either with or without phi-features.[22] If they enter the derivation without phi-features, then they have to be bound so that their features can be determined (cf. Kratzer's 2009:195 Feature Transmission under Binding). But crucially, binding is also consistent with a configuration in which the pronoun enters the derivation with its phi-features already valued and the appearance of phi-feature agreement is achieved via the workings of presupposition projection. We need the former option as part of our account of the bound pronoun effect, and we need the latter option in order to ensure that structures like (77) can be built. In (77), the bound pronoun is separated from its antecedent by at least two phase heads, and so should not be accessible for feature transmission.[23] Instead, we get what looks like long-distance phi-feature "agreement" as a consequence of the fact that presupposition projection is not subject to the PIC.

(77) Every man$_1$ thinks [$_{CP}$ that Ann said [$_{CP}$ that Mary saw him$_1$]]

5 Islands

Before concluding, we offer some preliminary remarks in this section on the relevance of the bound pronoun effect to island phenomena. In particular, for at least some island types including adjunct islands and *wh*-islands, we see the same cline of acceptability familiar from the phenomena we focused on in this paper: extraction out of a nonfinite clause is fairly acceptable (78a/79a), extraction out of a finite clause with a bound pronominal subject is somewhat degraded (78b/79b), and extraction out of a finite clause with no bound pronominal subject is the most degraded (78c/79c).[24]

(78) a. What$_2$ did John$_1$ go home [after PRO$_1$ reading t$_2$]?

b. ?What$_2$ did John$_1$ go home [after he$_1$ read t$_2$]?

c. *What$_2$ did John go home [after Mary read t$_2$]?

(79) a. What$_2$ did John$_1$ wonder [whether PRO$_1$ to read t$_2$]?

b. ?What$_2$ did John$_1$ wonder [whether he$_1$ should read t$_2$]?

c. *What$_2$ did John wonder [whether Bill should read t$_2$]?

In this connection, it is interesting to note that Ross (1967) questioned Chomsky's (1964) *wh*-island constraint on the basis that it was too strong, and the

data Ross offered to support this position involved controlled infinitival embedded

questions (80a-d) as well as six examples of embedded finite questions with bound

pronominal subjects (80e-g, 81). (Although Ross did not actually say that these

pronouns were bound, this is surely the intended interpretation, since there is no

context to support a free reading.) The data in (80)-(81) are taken from Ross

1967:27 with the judgment marks as they appear in the original.

(80) He told me about a book which I can't figure out

    a. whether to buy or not.

    b. how to read.

    c. where to obtain.

    d. what to do about.

    e. why he read.

    f. ?whether I should read.

    g. ??when I should read.

(81) Which books did he tell you

    a. why he wanted to read?

    b. ?whether he wanted to read?

    c.??when he wanted to read?

Ross noted that extraction out of infinitival embedded questions seemed to be more

acceptable than extraction out of finite embedded questions. He also noted

regarding his examples of extraction out of a finite embedded question that "there are many sentences which differ in no way which I can discern from those in [80e-g, 81] but which I find totally unacceptable. (Chomsky's example, '*what did he wonder where John put?' is a good case in point)" (p. 27). The bound pronoun effect suggests a solution to Ross's puzzle: (80e-g, 81) all contain a bound pronominal subject.

We hypothesize that the bound pronoun effect as manifest in islands is amenable to the same kind of phase-theoretic proposal we advanced for the core cases considered in this paper. In particular, suppose that what makes a clause an island for extraction is that it has some property that disables movement to its edge. This is of course the classic treatment of *wh*-islands, and may also extend to at least some adjunct islands if we adopt Larson's (1990) proposal that some adjunct-introducing prepositions like *before* and *after* combine with CP complements whose Spec position is filled by an operator. If [Spec,CP] is already filled, then it is not available as an intermediate landing site. Consequently, if the CP is a phase, then extraction will incur a PIC violation. But if a bound pronominal subject voids the phasal status of CP, as we have proposed, then extraction can proceed without the need for an intermediate landing site.

That being said, as David Pesetsky (pers. comm.) reminds us, it remains the case that extraction of *adjuncts* out of islands is robustly ungrammatical, regardless of the status of the embedded subject, as illustrated in (82). Consequently, we leave for future work a more complete investigation of bound pronouns in islands.[25]

(82) a. *How$_2$ did John$_1$ go home [after PRO$_1$ solving the problem t$_2$]?

b. *How$_2$ did John$_1$ go home [after he$_1$ solved the problem t$_2$]?

c. *How$_2$ did John go home [after Mary solved the problem t$_2$]?

6 Conclusions

This paper began with the observation that a bound pronoun in the subject position of a finite embedded clause renders the clause boundary relatively transparent to syntactic processes and relations ordinarily confined to monoclausal, control, and raising configurations. We showed that this effect holds for a wide range of "quasi-clause-bound" phenomena including *too/enough* movement, gapping, comparative deletion, ACD, quantifier scope interaction, multiple questions, pseudogapping, reciprocal binding, multiple sluicing, family of questions, extraposition, and tough movement. And we documented the effect experimentally for *too/enough* movement, comparative deletion, and multiple questions.

Toward an explanation, we suggested that the relevant locality domain for all of these phenomena is the phase, and that bound pronouns have the option of entering the derivation with unvalued phi-features, thereby voiding phasehood. This basic picture is complicated by the fact that the bound pronoun must be in subject position in order to extend the locality domain, and in response to this we entertained the view that only unvalued features that stand in a sufficiently local relationship to the phase head (in particular, a head-to-head relationship) void phasehood.

This account has two primary theoretical implications. The first is that not all bound pronouns are created equal: bound pronouns can either enter the derivation phi-complete, or enter the derivation unvalued and thereby interact with core grammatical processes. This conclusion echoes Chomsky's (1955/1975) treatment of third-person pronouns as well as more recent work on bound pronouns by Kratzer (2009) (see note 20). The second theoretical implication is that not all finite CPs are created equal, specifically with respect to their phasal status. The bound pronoun effect offers novel evidence for the view that feature valuation has a role to play in phase theory.

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Appendix: Statistical analysis of experimental results

In this appendix, we describe in greater detail the statistical analysis of the experimental investigation described in section 3.4 above. In selecting tests for statistical analysis, we assume following Sprouse (2011) and others that sentence acceptability judgments do not necessarily conform to a ratio scale; that is, we assume that participants treat the seven points on the Likert scale as defining a ranking, but we do not assume that the difference between a rating of 2 and a rating of 3, for example, is the same as the difference between a rating of 3 and a rating of 4. This means that the resulting data have to be treated as ordinal data rather than as ratio-scale data.

The input to the statistical analysis for Experiment 1 is 2,475 test sentences rated on a scale of 1 to 7. We treat the rating as the dependent variable. Each of the 2,475 sentences is coded for two factors that constitute the independent variables. The *phenomenon* factor consists of the three categories listed in (A1a) and the *condition* factor consists of the six categories listed in (A1b).

(A1)a. Phenomenon: Comparative Deletion, Multiple Questions, *too/enough*
      Movement
   b. Condition: BaseLine, NonFinite, BoundSubj, BoundObj, BoundPoss, NoBinding

The first test we employ is an Independent-Samples Kruskal-Wallis Test, a rank-based nonparametric test similar to a one-way ANOVA but appropriate for ordinal (non-ratio-scale) data (see Sheskin 2003). This test allows us to determine whether or not the distribution of sentence ratings is the same across the different categories of a chosen factor. To run this test and all the other statistical tests described in what follows, we use IBM SPSS Statistics Version 24.

Applied to the phenomenon factor, the Kruskal-Wallis Test indicates that the distribution of ratings is *not* the same across the different categories of the phenomenon factor ($X^2(2) = 107.130$, $p < 0.01$). Furthermore, pairwise comparisons reveal that each phenomenon gives rise to a rating profile that is significantly different from each other phenomenon. These pairwise comparisons are shown in Table A1, with significance values adjusted by the Bonferroni correction for multiple tests. Taken together with the mean rank for each phenomenon indicated in Table A2, this analysis supports the conclusion that the three phenomena investigated in the experiment conform to the acceptability cline in (A2): on the whole, comparative deletion sentences (Mean Rank = 1422.17) were rated higher ($p < 0.01$) than *too/enough* movement sentences (Mean Rank = 1229.29), which were in turn rated higher ($p < 0.01$) than multiple questions (Mean Rank = 1062.54. While interesting and worthy of further study, we take this result to be orthogonal to our main purpose, which is to establish how ratings vary as a function of the condition factor. That being said, the cline that emerges here may bear an interesting cross-linguistic connection to Rizzi's (1978) claim that Italian does not allow multiple questions.

(A2) Comparative Deletion > *too/enough* Movement > Multiple Questions

Sample1 - Sample2	Test Statistic	Standard Error	Standard Test Statistic	Significance	Adjusted Significance
Multiple Questions – *too/enough* Movement	-166.750	34.776	-4.795	.000	.000***
Multiple Questions - Comparative Deletion	359.627	34.776	10.341	.000	.000***
too/enough Movement - Comparative Deletion	192.877	34.776	5.546	.000	.000***

Table A1: Experiment 1 pairwise comparisons of phenomena

Phenomenon	Mean Rank
Comparative Deletion	1,422.17
too/enough Movement	1,229.29
Multiple Questions	1,062.54

Table A2: Experiment 1 mean ranks for phenomena

Applied to the condition factor, the Kruskal-Wallis Test indicates that the distribution of ratings is *not* the same across the different conditions ($X^2(5) = 325.701$, $p < 0.01$). Pairwise comparisons reveal that each condition gives rise to a rating profile significantly different from each other condition ($p < 0.01$), except for the BoundPoss, BoundObj, and NoBinding conditions which are not significantly different from one another ($p = 1$). These pairwise comparisons are shown in Table A3. Taken together with the mean ranks for each condition (Table A4), this analysis supports the conclusion that the six conditions investigated in Experiment 1 conform to the cline of acceptability indicated in (A3): BaseLine sentences were rated as most acceptable (Mean Rank = 1841.69), followed by sentences with a nonfinite embedded clause (Mean Rank = 1494.58), followed by sentences with a finite embedded clause containing a bound pronominal subject (Mean Rank = 1258.58). At the low end are sentences with an embedded finite clause containing a

bound pronominal object (Mean Rank = 1064.88), a bound subject-internal

possessor (Mean Rank = 1024.02), or no bound pronoun (Mean Rank = 1046.09).

These three give rise to ratings not significantly different from one another.

(A3) BaseLine > NonFinite > BoundSubject > {BoundObj = NoBinding = BoundPoss}

Sample1 - Sample2	Test Statistic	Standard Error	Standard Test Statistic	Significance	Adjusted Significance
BoundPoss-NoBinding	-22.074	47.087	-.469	.639	1
BoundPoss -BoundObj	40.861	47.087	.868	.386	1
BoundPoss -BoundSubj	-234.564	47.087	-4.982	.000	.000***
BoundPoss -NonFinite	-470.560	47.087	-9.993	.000	.000***
BoundPoss -BaseLine	817.672	57.669	14.179	.000	.000***
NoBinding - BoundObj	18.787	47.087	.399	.690	1
NoBinding - BoundSubj	212.490	47.087	4.513	.000	.000***
NoBinding - NonFinite	-448.486	47.087	-9.525	.000	.000***
NoBinding - BaseLine	795.598	57.669	13.796	.000	.000***
BoundObj -BoundSubj	-193.703	47.087	-4.114	.000	.000***
BoundObj - NonFinite	-429.699	47.087	-9.126	.000	.000***
BoundObj - BaseLine	776.811	57.669	13.470	.000	.000***
BoundSubj - NonFinite	-235.996	47.087	-5.012	.000	.000***
BoundSubj - BaseLine	583.108	57.669	10.111	.000	.000***
NonFinite - BaseLine	347.112	57.669	6.019	.000	.000***

Table A3: Experiment 1 pairwise comparisons of conditions

Condition	Mean Rank
BaseLine	1,841.69
NonFinite	1,494.58
BoundSubj	1,258.58
BoundObj	1,064.88
NoBinding	1,046.09
BoundPoss	1,024.02

Table A4: Experiment 1 mean ranks for conditions

A limitation of the Kruskal-Wallis Test is that it only allows us to test one

factor at a time: phenomenon or condition. To remedy this, we employ a more

powerful statistical technique: a Generalized Estimating Equations (GEE) analysis.

GEE is a technique appropriate for ordinal data with multiple independent variables, similar to a generalized multiple linear regression but different in that it requires fewer assumptions about the data and it models population averages rather than yielding subject-specific estimates (see e.g. Kenward, Lesaffre and Molenberghs 1994 for a discussion of GEE in the context of a psychiatric study). Applied to the data in Experiment 1, GEE yields the results indicated in Table A5.

Of most relevance to us are the rows labeled A-C an the rows labeled D-I respectively. Looking first at the rows labeled A-C, the *too/enough* Movement category in row C is (arbitrarily) selected as a baseline, and the B column shows the increase in log odds for the other categories in this factor, namely Multiple Questions and Comparative Deletion, yielding a rating that is higher than the rating for a *too/enough* Movement sentence. The Exp(B) column translates this figure into an odds ratio: odds ratios that are greater than 1 indicate an increased likelihood of a higher rating whereas ratios less than 1 indicate a decreased likelihood of a higher rating. Hence, we see confirmation of the conclusion from the pairwise comparisons that ratings for *too/enough* Movement sentences are significantly *higher* in odds ratio than ratings for Multiple Questions sentences (Exp(B) = 0.618, *p* < 0.01) and significantly *lower* in odds ratio (0.62) than ratings for Comparative Deletion sentences (Exp(B) = 1.570, *p* < 0.01).

Turning to the rows labeled D-I, the NoBinding condition is (arbitrarily) selected as a baseline, and the Exp(B) column indicates the odds ratio for each of the other conditions in yielding a rating that is higher than that for NoBinding. We see, also consistent with the pairwise comparisons shown above, that the odds ratios for

the NoBinding sentences are not significantly different from those for BoundObj

(Exp(B) = 1.016, p = 0.917) or BoundPoss sentences (Exp(B) = 0.959, p = 0.786), but

are significantly *lower* than those for BoundSubj (Exp(B) = 1.680, p = 0.002),

NonFinite (Exp(B) = 3.272, $p < 0.01$), and BaseLine (Exp(B) = 9.608, $p < 0.01$)

sentences.

Parameter Estimates

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test Wald Chi-Square	df	Sig.	Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper					Lower	Upper
Threshold	[Choice_DV=1]	-2.041	0.1520	-2.339	-1.743	180.362	1	0.000	0.130	0.096	0.175
	[Choice_DV=2]	-0.939	0.1350	-1.203	-0.674	48.296	1	0.000	0.391	0.300	0.510
	[Choice_DV=3]	-0.075	0.1382	-0.346	0.196	0.293	1	0.588	0.928	0.708	1.217
	[Choice_DV=4]	0.516	0.1363	0.249	0.783	14.317	1	0.000	1.675	1.282	2.188
	[Choice_DV=5]	1.375	0.1456	1.090	1.661	89.291	1	0.000	3.957	2.975	5.263
	[Choice_DV=6]	2.666	0.1574	2.358	2.975	286.817	1	0.000	14.385	10.566	19.584
A. [Multiple Questions]		-0.482	0.1118	-0.701	-0.263	18.553	1	0.000	0.618	0.496	0.769
B. [Comparative Deletion]		0.451	0.1202	0.215	0.686	14.066	1	0.000	1.570	1.240	1.987
C. [*too/enough* Movement]		0ᵃ							1		
D. [BaseLine]		2.263	0.2115	1.848	2.677	114.497	1	0.000	9.608	6.348	14.543
E. [NonFinite]		1.185	0.1601	0.872	1.499	54.832	1	0.000	3.272	2.391	4.477
F. [BoundSubj]		0.519	0.1644	0.196	0.841	9.950	1	0.002	1.680	1.217	2.319
G. [BoundObj]		0.016	0.1532	-0.284	0.316	0.011	1	0.917	1.016	0.753	1.372
H. [BoundPoss]		-0.042	0.1548	-0.346	0.261	0.074	1	0.786	0.959	0.708	1.299
I. [NoBinding]		0ᵃ							1		
(Scale)		1									

Dependent Variable: Choice_DV
Model: (Threshold), Phenomenon, Condition
a. Set to zero because this parameter is redundant.

Table A5: Experiment 1 Generalized Estimating Equation Parameter Estimates

We now turn our attention to the analysis of the data in Experiment 2. Since

Experiment 2 is identical in setup to Experiment 1 except that the sentences

instantiating the BoundObj and BoundPoss conditions are replaced by sentences

that instantiate 1pSubj and 2Subj conditions, respectively, we employ the same

statistical tests. As expected, the Kruskal-Wallis Test applied to the phenomenon

factor in the Experiment 2 data indicates that the distribution of ratings is *not* the

same across the different categories of the phenomenon factor ($X^2(2) = 86.409$, $p <$

0.01). As shown in Tables A6 and A7, we see the same cline of acceptability

schematized in (A2) as we did for the Experiment 1 data. Also as expected, the

Kruskal-Wallis Test applied to the condition factor indicates that the distribution of

ratings is *not* the same across the different conditions ($X^2(5) = 349.406$, $p < 0.01$).

The pairwise comparisons and mean ranks are shown in Tables A8-A9. Taken

together, they support the conclusion that the sentences tested in Experiment 2

conform to the cline of acceptability schematized in (A4). Of particular interest is the

observation that the 1pSubj and 2pSubj conditions give rise to rating profiles that

are not significantly different from that of the NoBinding condition.

(A4) BaseLine > NonFinite > BoundSubject > {1pSubj = 2pSubj = NoBinding}

Sample1 - Sample2	Test Statistic	Standard Error	Standard Test Statistic	Significance	Adjusted Significance
Multiple Questions – *too/enough* Movement	-197.550	34.744	-5.686	0.000	0.000***
Multiple Questions - Comparative Deletion	320.315	34.775	9.211	0.000	0.000***
too/enough Movement - Comparative Deletion	122.764	34.775	3.530	0.000	0.001***

Table A6: Experiment 2 pairwise comparisons of phenomena

Phenomenon	Mean Rank
Comparative Deletion	1,384.37
too/enough Movement	1,261.61
Multiple Questions	1,064.06

Table A7: Experiment 1 mean ranks for phenomena

Sample1 - Sample2	Test Statistic	Standard Error	Standard Test Statistic	Significance	Adjusted Significance
2pSubj-1pSubj	38.236	57.122	.811	.417	1
2pSubj-NoBinding	61.978	47.096	-1.316	.188	1
2pSubj-BoundSubj	-292.945	47.096	-6.220	.000	.000***
2pSubj-NonFinite	-542.577	47.096	-11.521	.000	.000***
2pSubj-BaseLine	-819.462	57.659	-14.056	.000	.000***
1pSubj-NoBinding	-23.742	47.070	-.504	.614	1
1pSubj-BoundSubj	-254.709	47.070	-5.411	.000	.000***
1pSubj-NonFinite	-504.341	47.070	-10.715	.000	.000***
1pSubj-BaseLine	-772.225	57.637	-13.398	.000	.000***
NoBinding-BoundSubj	230.967	47.043	4.910	.000	.000***
NoBinding-NonFinite	-480.599	47.043	-10.216	.000	.000***
NoBinding-BaseLine	748.483	57.616	12.991	.000	.000***
BoundSubj-NonFinite	-249.632	47.043	-5.306	.000	.000***
BoundSubj-BaseLine	517.517	57.616	8.982	.000	.000***
Nonfinite-BaseLine	267.884	57.616	4.649	.000	.000***

Table A8: Experiment 2 pairwise comparisons of conditions

Condition	Mean Rank
BaseLine	1,802.87
NonFinite	1,534.98
BoundSubj	1,285.35
NoBinding	1,054.39
1pSubj	1,030.64
2pSubj	992.41

Table A9: Experiment 2 mean ranks for conditions

Finally, the results of the GEE analysis as applied to the data from

Experiment 2 are as indicated in Table A10. Here we see results that are consistent

with the conclusions from the Kruskal-Wallis test. As seen in rows A-C, *too/enough*

Movement sentences are rated significantly *higher* than Multiple Questions (Exp(B)

= 0.567, *p* < 0.01) but *lower* than Comparative Deletion sentences in a way that

trends toward significance (Exp(B) = 1.322, *p* = 0.014). As seen in rows D-I, ratings

for NoBinding sentences are not significantly different than those for 2pSubj

sentences (Exp(B) = 0.848, *p* = 0.302) or 1pSubj sentences (Exp(B) = 0.919, *p* =

0.590), but significantly lower than those for BoundSubj sentences (Exp(B) = 1.773,

p < 0.01), NonFinite sentences (Exp(B) = 3.334, p < 0.01), and BaseLine sentences

(Exp(B) = 8.405, p < 0.01).

Parameter Estimates

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test Wald Chi-Square	df	Sig.	Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper					Lower	Upper
Threshold	[Choice_DV=1]	-2.076	0.1527	-2.375	-1.777	184.771	1	0.000	0.125	0.093	0.169
	[Choice_DV=2]	-0.933	0.1357	-1.199	-0.667	47.339	1	0.000	0.393	0.301	0.513
	[Choice_DV=3]	-0.099	0.1338	-0.361	0.164	0.545	1	0.460	0.906	0.697	1.178
	[Choice_DV=4]	0.615	0.1359	0.348	0.881	20.455	1	0.000	1.849	1.417	2.413
	[Choice_DV=5]	1.493	0.1418	1.216	1.771	110.921	1	0.000	4.453	3.372	5.879
	[Choice_DV=6]	2.610	0.1597	2.297	2.923	267.078	1	0.000	13.602	9.946	18.602
A. [Multiple Questions]		-0.568	0.1207	-0.804	-0.331	22.096	1	0.000	0.567	0.447	0.718
B. [Comparative Deletion]		0.279	0.1138	0.056	0.502	6.001	1	0.014	1.322	1.057	1.652
C. [*too/enough* Movement]		0ª							1		
D. [BaseLine]		2.129	0.2434	1.652	2.606	76.489	1	0.000	8.405	5.216	13.544
E. [NonFinite]		1.204	0.1409	0.928	1.480	73.029	1	0.000	3.334	2.529	4.394
F. [BoundSubj]		0.572	0.1374	0.303	0.842	17.356	1	0.000	1.773	1.354	2.320
G. [1pSubj]		-0.085	0.1572	-0.393	0.223	0.291	1	0.590	0.919	0.675	1.250
H. [2pSubj]		-0.164	0.1594	-0.477	0.148	1.064	1	0.302	0.848	0.621	1.160
I. [NoBinding]		0ª							1		
(Scale)		1									

Dependent Variable: Choice_DV
Model: (Threshold), Phenomenon, Condition
a. Set to zero because this parameter is redundant.

Table A10: Experiment 2 Generalized Estimating Equation Parameter Estimates

These venues include Harvard, Indiana University, Krakow (Kraków Syntax Lab 2016, Jagiellonian University), Rio de Janeiro (X Congresso Internacional da ABRALIN), Princeton (Jersey Syntax Circle: Prospects for the Theory of Syntax), University of Arizona, UCLA, Universität Leipzig, University of Maryland, University of Massachusetts at Amherst, and Universität Tübingen (Pronouns@Tübingen 2).

[1] Regarding the multiple question in (2f), it bears noting that there is one strand in the literature that takes the position that the *wh*-elements in a multiple question can in fact be separated by a finite clause boundary and that the in situ *wh*-element can even be embedded in an island; see, e.g., Huang 1982a; Lasnik & Saito 1984; Fiengo, Huang, Lasnik & Reinhart 1988. Here we depart from this view and instead follow Kuno & Robinson (1973) and Postal (1974) in treating examples like (2f) as ungrammatical. For relevant experimental findings on the relative acceptability of multiple questions that span a finite clause boundary, see section 3.4 and the appendix.

[2] See Postal 1974 for an early version of this observation in connection with tough movement, comparative deletion, and multiple questions (on the latter cf. also Kuno and Robinson 1972). The gapping facts are discussed by Johnson (1996) and Lechner (2001). And the sizeable literature on locality domains for quantifier scope

and ACD is too vast to do justice to here, but includes May 1977, 1985; Larson & May 1990; Hornstein 1994; Farkas & Giannakidou 1996; Kennedy 1997; Wilder 1997; Kayne 1998; Fox 2000; Cecchetto 2004; Moulton 2008; Hackl, Koster-Hale & Varvoutis 2012; Wurmbrand 2013, 2015a.

Incidentally, it is worth asking whether the crucial distinction between (2) and (3) is the (non-)finiteness of the embedded clause or the nullness/overtness of the embedded subject. In principle it should be possible to adjudicate this matter by considering minimal variants in which the embedded clause is nonfinite but has an overt subject, as in (i). In practice, though, the judgments concerning (i) are not crystal-clear and so we refrain from taking a stance on whether the grammar should rule them out. The theory we end up proposing predicts that the sentences in (i) should be ungrammatical if the nonfinite complement to *want* is a phasal category, a question we leave open for future research.

(i)   a. ?This magazine is too low-brow [for John to want Fred to read __].

        b. ?John wants Fred to like apples and [Bill <s>wants Fred to like</s> oranges].

        c. ?More people want Fred to like apples [than <s>want Fred to like</s> oranges].

        d. ?John wants Fred to read everything [Bill does <s>want Fred to read</s>].

        e. ?[**At least one professor** wants Fred to read **every journal**]. ($\forall$>$\exists$)

        f. ?Tell me [**who** wants Fred to read **which journal**].

[3] This observation and many of the relevant facts are laid out by Lasnik (2006), who reports on material based in substantial part on unpublished joint research with Tomohiro Fujii and Norbert Hornstein. Versions of the observation as it relates to particular phenomena are found in scattered places throughout the literature. These include Sloan 1991 (on family of questions), Nishigauchi 1998 (on multiple questions, multiple sluicing, and gapping), Merchant 2001:113, note 4 (on gapping and multiple sluicing), Syrett & Lidz 2011 (on antecedent-contained deletion), and Lasnik 2014 (on multiple sluicing and extraposition).

[4] In this connection, it is noteworthy that there is no bound pronoun effect for clitic climbing; in other words, clitic climbing in languages like Spanish and Italian is always banned across a finite clause boundary, even when the subject of the embedded finite clause is a bound pronoun. Presumably this is related to the fact that unlike the clause-mate phenomena under investigation in this paper, not even all nonfinite clauses support clitic climbing; whatever is responsible for this more severe restriction would then also account for the absence of the bound pronoun effect. We hope to address this issue further in future work.

[5] Aside from restructuring, other potential ways in which "nonfiniteness" may be too coarse-grained a notion in characterizing locality domains include control/raising asymmetries (there is agreement that inverse scope is possible out of control complements but disagreement about whether it is possible out of raising complements: Wurmbrand 2013 and Frank & Storoshenko 2015) and asymmetries between control and raising complements on the one hand vs. ECM or raising-to-object complements on the other hand.

[6] For the sake of completeness, we document in this note one other potential manifestation of the bound pronoun effect. Kratzer (1998b:5), following Ruys (1992), observes that bound pronouns facilitate intermediate scope readings for indefinites in sentences like (i) (cf. (ii) for the variant without the bound pronoun). That is, it is easier in (i) than in (ii) to understand *some student* as varying from one professor to the next but not varying, for each professor, from one class session to the next.

    (i)   [Every professor]$_1$ got a headache whenever some student **he$_1$** hated was in class.

    (ii)   [Every professor]$_1$ got a headache whenever some student **Mary** hated was in class.

Whether or not the contrast in (i)/(ii) can be subsumed under the same kind of phase-theoretic account that we advance for the core cases of the bound pronoun effect is unfortunately not something that we will be able to establish in this paper, but it may be an interesting topic for future investigation.

[7] Another potential subject orientation effect concerns the antecedent. In addition to the bound pronoun having to be in subject position in order for the bound pronoun effect to hold, data like (ia-b) suggest that the antecedent has to be in subject position as well.

(i)   a. *Joe$_1$ persuaded Bill$_2$ that he$_2$ should read *Pride & Prejudice* and Tim$_3$

~~persuaded Bill$_2$ that he$_2$ should read~~ *Sense & Sensibility*.

b. *Joe$_1$ promised Bill$_2$ that he$_2$ had already read *Pride & Prejudice* and Tim$_3$

~~promised Bill$_2$ that he$_2$ had already read~~ *Sense & Sensibility*.

Anticipating our phase-theoretic account of the bound pronoun effect in section 4 below, an initially attractive way of making sense of this constraint on the antecedent would be to propose that transfer of a candidate phase head's complement occurs as soon as the bound pronoun is valued by its antecedent, so that valuation of the bound pronoun by something lower than the subject would not delay transfer long enough to extend locality. Unfortunately, however, this approach faces difficulty given that some of the clause-mate phenomena that trigger the bound pronoun effect (including for example tough movement, which also raises a number of other well known problems) involve dependencies that span across the valuing antecedent subject. So in these cases, we see that transfer must continue to be delayed even after the bound pronoun is valued. Consequently, this is not something that we will be able to account for in this paper, though we hope to address it in future work.

[8] A notable limitation of this design is that the sentences that instantiate the various bound pronoun conditions (24b-d, 25b-d) can also be read in such a way that the relevant pronoun is free rather than bound. Since we did not ask experimental participants to rate sentences relative to any particular interpretation, there is no guarantee that their judgments reflect the bound reading. But the expectation is that

since each sentence is judged in isolation without a context that could supply a referent for a free pronoun, the only salient reading is the bound reading.

[9] This wording in the instructions is borrowed from White & Grano's (2014) experimental investigation of partial control, whose materials are available at:

https://github.com/aaronstevenwhite/PartialControlExperiments

[10] Totals for Comparative Deletion conditions 1P and 2P in Table 2 are slightly lower than they should be (149 and 148 instead of 150 and 150, respectively) because one of the participants in Experiment 2 neglected to supply a rating for three of the target items. But the ratings for the other 30 target items that this participant did rate are included in the table and in the statistical analysis.

[11] See e.g. Wurmbrand (2015a) on quantifier scope interaction. Wurmbrand proposes that quantifier raising is not clause-bound and that instead, quantifier raising across multiple finite clause boundaries incurs a processing cost that accounts for its degraded acceptability. On this kind of approach, the bound pronoun effect would have to be understood as some kind of processing facilitation on grammatical sentences rather than something that makes the difference between a grammatical sentence and an ungrammatical sentence. It remains to be seen how such a processing account would fare in comparison with the grammatical account we propose below.

[12] The way (31c) is formulated presupposes (possibly problematically) that bound pronouns are distinguished from free pronouns in the lexicon (i.e., it is determined as soon as the pronoun is merged into the derivation whether it will be bound or not; cf. also note 20 below). We present things this way for expository convenience,

and simply wish to note here that the final version of our account, stated in (36c) and further elaborated in section 4.4, does not require such an assumption. By way of preview, what we will ultimately say is that pronouns (irrespective of any free/bound distinction) optionally enter the derivation with unvalued phi-features. If a pronoun enters the derivation with unvalued phi-features and ends up being free, the derivation crashes, since phi-feature valuation piggybacks on binding. By contrast, if the pronoun ends up being bound, its unvalued features will be determined by the binder.

[13] It is not entirely clear to us how to understand "propositional" in such a way that it picks out CP and *v*P as a natural class to the exclusion of other categories such as TP. This leaves us with a "list problem": the set of phasal categories has to be stipulated rather than following from something more general. It is interesting to note that versions of the "list problem" are found elsewhere in Chomsky's work; for example, Chomsky's (1973) Tensed Sentence Condition and Specified Subject Condition are both subsumed under the notion of Government in Chomsky 1981, but buried in the definition of Governing Category is the term of art SUBJECT (all caps), which Chomsky defines with a list: finite AGR (supplanting the Tensed Sentence Condition) and the subject of a nonfinite clause (supplanting the Specified Subject Condition). Yet another example of the list problem is the definition of "cyclic nodes" as NP and S in classic Subjacency, something Chomsky (1986) attempts to remedy in *Barriers.* In any case, the phasal status of *v*P has not gone unquestioned (den Dikken 2006), and the analysis we pursue in this paper in fact

seems to be a better fit with the view that CPs are phases (under some conditions) whereas *v*Ps are not. See section 4.3 below for further discussion.

[14] Predecessors of this idea include Felser 2004, who proposes that "phases should best be defined in terms of convergence, with the 'propositional' categories CP and *v*P being potential *candidates* for local Spellout only"; Wurmbrand 2011, who proposes that "only interpretationally *complete* units can be transferred … *i*F:__ in a potential *phase* projection postpones *transfer*" (where "*i*F:__" is an unvalued interpretable feature) (p. 69); and Uriagereka (pers. comm.), who suggests, building on Lasnik & Uriagereka (2005), that "transfer is suspended when an anaphoric dependency is at stake (until the antecedent enters the picture)".

[15] An anonymous reviewer points out that "at ZP" in (44b) can be interpreted in more than one way: does inaccessibility arise as soon as Z is merged in, or not until ZP is complete? In what follows, we adopt Citko's (2014) interpretation: "The two definitions [i.e., strong PIC and weak PIC] differ with respect to when the domain of the phase head H becomes inaccessible: as soon as HP is complete versus at the point the next phase head (Z) is merged" (p. 33). In other words, on the strong PIC, inaccessibility arises when the phrase associated with the phase head is complete, whereas on the weak PIC, inaccessibility arises as soon as the next highest phase head is merged.

[16] A compromise is available: our theory is consistent with the possibility that *v* is a *candidate* phase head (which could account for why it seems to pattern like a phase head in certain respects: see e.g. Legate 2003; Lee-Schoenfeld 2008; Citko 2014). But it is never an *actual* phase head, because the head of its complement (i.e., V)

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always has morphological tense and agreement features that are not valued until higher in the clause.

[17] We also assume in the foregoing that Op cannot target intermediate [Spec,*v*P] positions. We make this simplifying assumption primarily for three reasons. First, if Op cannot target intermediate [Spec,CP] positions, then it seems reasonable to hypothesize that it also cannot target intermediate [Spec,*v*P] positions. Second, if successive cyclic movement via [Spec,*v*P] depends on the status of *v* as a (candidate) phase head, then our tentative conclusion that *v* is not a (candidate) phase head also constitutes a reason not to consider intermediate [Spec,*v*P] positions. Finally, the third reason is practical: entertaining intermediate [Spec,*v*P] landing sites would excessively multiply the number of analytical options to be assessed. And since our goal here is a "proof of concept" of a phase-theoretic account of the bound pronoun effect, we need not consider every conceivable way things could be.

[18] There is also more to be said about multiple questions. Here, the (covertly) moved phrase clearly has *wh*-features, reopening the puzzle about why it cannot move in successive cyclic fashion. But regardless of *why* successive cyclicity is blocked in multiple questions, *that* it is blocked is a conclusion convergent with recent work on multiple questions. Kotek (2014), based on data very different from that which concerns us here, concludes that "the covert movement of the in-situ *wh* in superiority-obeying questions is not an unbounded long-distance movement, as often assumed, but instead a short QR-like movement, which is only extended in extraordinary cases, …" (p. 209). Similarly, Saito (1994) proposes that the lower *wh*-

element in a multiple question LF adjoins to the higher *wh*-element rather than moving to a [Spec,CP] position.

In a similar vein, an anonymous reviewer asks why successive cyclic movement fails for family of questions and for multiple sluicing as exemplified in (i) and (ii) respectively.

(i) *[Which journal does everyone claim that John reads __]?

Anticipated answer type: Bill claims that John reads *LI*, Tim claims that John reads *NLLT*, etc.

(ii) *Someone claims that John is worried about something but I don't know [who <~~claims that John is worried~~> about what].

For family of questions, we assume following Sloan (1991) and Lasnik and Saito (1992) that the crucial factor is the structural relationship between the quantifier and the trace of the wh-movement. Consequently, (i) is ruled out because although the *wh*-phrase can move successive-cyclically, its trace is not in a sufficiently local configuration with the quantifier. For multiple sluicing, we assume following Lasnik (2014) that the second *wh*-expression undergoes rightward movement (extraposition). Plausibly, such movement is not subject to successive cyclicity even when the moved phrase happens to have *wh*-features, though we leave a full investigation of this question to future research. See Lasnik (2014) for some speculation about why extraposition cannot be successive cyclic.

[19] We assume here for concreteness that bound pronouns are bound and valued by their DP antecedents. But cf. Kratzer (2009) for the alternative view that bound pronouns are bound by clause-local verbal functional heads C and *v*. As far as we can tell, this choice point is in principle orthogonal to the concerns of this paper, although Kratzer's particular implementation may not be compatible with our approach, insofar as her system would allow C to enter the derivation with valued phi-features that would immediately value a [Spec,TP] pronoun and render the clause it appears in phi-complete and hence phasal.

[20] One of the central arguments invoked in favor of this kind of approach has to do with the observation, originally due to Partee (1989), that sometimes phi-features on first- and second-person bound pronouns appear as though they are ignored by the semantics, such as in examples like (i). Such facts can be readily made sense of if bound pronouns like *my* in (i) acquire their phi-features at a stage of the derivation that is too late for these features to be interpreted by the semantics (cf. also Landau 2016 for discussion).

(i) Only I did my homework.

 Relevant reading: I am the only *x* such that *x* did *x's* homework.

That being said, the verdict is still out on whether late valuation of phi-features is the right way to account for sentences like (i). Other analytical options that have been entertained include phi-feature deletion (von Stechow 2003; Reuland 2010) as

well as approaches in which the phi-features on *my* in (i) are in fact interpreted after all (Cable 2005; Spathas 2010; Jacobson 2012; Sudo 2012). So, it may be premature to take sentences like (i) as strong evidence that bound pronouns enter the derivation with unvalued phi-features.

In a similar vein, Heim, Lasnik & May (1991) argue that under some conditions, bound pronouns that range over atomic individuals are nonetheless syntactically plural due to a syntactic agreement requirement with their antecedent. Taken at face value, this kind of situation also seems to support the view that phi-features on bound pronouns are at least sometimes valued late and ignored by the semantics, though other approaches are conceivable.

[21] For concreteness we follow Heim & Kratzer (1998) in assuming that binding of a pronoun depends on QR of the antecedent, which triggers Predicate Abstraction in the semantics. When the antecedent's movement index matches the index on the pronoun, binding results.

[22] Essentially the same idea is proposed by Kratzer (2009), based on a very different set of data. This hybrid approach to pronouns is also reminiscent of Chomsky's (1955/1975:519-524) proposal that there are "two elements *he* and *he**, with *he** a proper noun, and *he* a pronoun just like *I, you*" (p. 524 of 1975 edition). For Chomsky, though, the distinction correlated with whether the pronoun had a (sentence-local) antecedent, whereas for us, as well as for Kratzer (2009), the suggestion is that having an antecedent is a necessary but not a sufficient condition for having entered the derivation with unvalued phi-features.

[23] It is also conceivable that there are other structural constraints aside from the PIC that limit the application of feature transmission. For example, it could be that feature transmission is subject to intervention. Consider the minimal pair in (i)-(ii). To our ear, (ii) sounds rather degraded in comparison with (i), and one possible take on why is that the DP *Mary* in (ii) intervenes and thereby disables feature transmission between the bound pronoun and its antecedent.

(i) ?This book is too expensive [for John$_1$ to promise that he$_1$ will buy Op].

(ii) *This book is too expensive [for John$_1$ to promise **Mary** that he$_1$ will buy Op].

That being said, we discuss below some examples from Ross (1967) that suggest that the bound pronoun effect may be operative for some island phenomena, and some of the relevant examples (71e, 72a-c) are not as degraded as we might have expected them to be if feature transmission is subject to intervention. We leave to future work a more thorough investigation of this issue.

[24] In a related vein, parasitic gaps are well known to be better in nonfinite adjuncts (ia) than in finite adjuncts (ic), and it seems to us that finite adjuncts with bound pronominal subjects pattern with nonfinite adjuncts in being acceptable with a parasitic gap (ib). So this appears to be yet another manifestation of the bound pronoun effect.

(i) Which papers did John read before…

    a. …filing?

    b. …he filed?

    c. ?…Bill filed?

[25] Classically, it was proposed that movement of arguments is subject only to Subjacency while movement of adjuncts is subject both to Subjacency and to the ECP (Huang 1982b; Lasnik & Saito 1984). While it is a reasonable hypothesis that what counts as a "barrier" for Subjacency is the same as that for the ECP, it is not a logically necessary one. So one way of interpreting the facts in (73) is that whatever principle is responsible for ECP effects is not subject to the kind of phase-theoretic constraints that give rise to the bound pronoun effect but rather obeys some other set of constraints.