Force shift as speech act anchoring

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Abstract

This paper investigates force shift, a phenomenon in which the canonical discourse conventions, or force, associated with a clause type can be overridden to yield polar questions with the help of additional force-indicating devices. Previous studies attribute force shift to the presence of a complex question force component operating on semantic content. Based on utterance particles and particle clusters in Cantonese, we analyze force shift as resulting from compositional operations on force-bearing expressions. We propose that a simplex force, such as assertion or question, denotes unanchored speech acts, while a force-shifting particle like Cantonese *ho2* is an anchoring function anchoring a speech act *A* to the speaker while querying whether or not the addressee can perform the speech act *A*. The proposed semantics makes predictions about *ho2*'s interactions with addressee-changing operations and imperatives, as well as about a larger family of force shift phenomena.

Keywords force shift · illocutionary force · speech acts · utterance particles · discourse dynamics · Cantonese

1 Introduction

Matrix clauses in natural language come in different types, with declaratives, interrogatives, and imperatives being representative ones (Sadock and Zwicky 1985; König and Siemund 2007; Portner 2018, a.o.). Clause types are studied both for their form and meaning. Common clause-typing devices include verb movement (Truckenbrodt 2006), subject omission (Portner 2007), final intonational contours (Gunlogson 2001), and final utterance particles (Law 1990, Cheng and Demirdache 1991, Davis 2011). Once a clause is marked with a clause-typing device, it bears conventional discourse effects, known as illocutionary force, sentential force, or more simply just force (Frege 1956; Stenius 1967; Searle 1969; Gunlogson 2001; Portner 2018, a.o.). It is commonly assumed that declaratives bear the force of assertion, interrogatives the force of question, and imperatives the force of request or command. Based on this correspondence, force is often analyzed as mediating between semantic content and speech acts, which are typically modeled as context

changing functions or context change potential (e.g., Gunlogson 2001; Farkas and Bruce 2010; Davis 2009, 2011; Krifka 2015; Bhadra 2020; Murray and Starr 2021; see also Kamp 1981; Heim 1983; Groenendijk and Stokhof 1991).

Against this simplified background is the recognition that certain speech acts seem to be more complex than others. This article investigates a particular type of complex speech act, one that involves shifting the canonical force of a clause type to a less canonical force with the help of identifiable force-indicating devices.[1] We refer to such complex speech acts as involving *force shift*. Unlike previous studies that focus on rising declaratives and rising imperatives in English, we investigate force shift in Cantonese with the help of its enriched inventory of final utterance particles.[2]

To witness force shift in Cantonese, let's first observe simplex particles like *gaa3* and *ne1*, used to mark a declarative with an assertive force in (1) and an *wh*-interrogative with a question force in (2), respectively.[3]

(1) Ziming sik haa **gaa3**.
Ziming eat shrimp ASRT
'Ziming eats shrimp.'

(2) Binggo sik haa **ne1**?
who eat shrimp WHQ
'Who eats shrimp?'

These simplex particles may form complex particle clusters with another particle *ho2*, as exemplified by (3) and (4). The presence of *ho2* turns the assertion and the *wh*-question to polar questions (see also Lam 2014; Tang 2015, 2020; Law et al. 2018).

(3) Ziming sik haa **gaa3 ho2**?
Ziming eat shrimp ASRT HO
Roughly: 'Ziming eats shrimp. Right?' assertion to polar question

(4) Binggo sik haa **ne1 ho2**?
who eat shrimp WHQ HO
'Who eats shrimp? Do you wonder?' *wh*-question to polar question

As suggested in the translations of these examples and to be made more precise in section 2, the polar questions associated with these particle clusters are complex speech acts partially resembling assertions (or *wh*-questions) and partially resembling polar questions. How best to derive these hybrid properties is hence at the heart of understanding force shift.

One way to capture force shift is to posit the presence of a *complex force*, as done in a variety of studies on rising declaratives in English (Gunlogson 2008; Northrup 2014; Krifka 2015; Farkas and Roelofsen 2017; Goodhue 2021). Broadly speaking, in this approach constructions involving force shift are associated with complex force, which is responsible for mapping a semantic content, typically a proposition, to a complex polar question with a weakened commitment or a bias.

[1] This working definition exclude indirect speech acts, such as rhetorical questions (e.g., *Is the Pope Catholic?*) and questions taken to be commands (e.g., *Can you pass the salt?*).

[2] In section 4.4, an attempt is made to extend the framework developed in this paper to rising declaratives and rising imperatives in English.

[3] All Cantonese sentences in this paper are given in Jyutping, a romanization system developed by the Linguistic Society of Hong Kong. Lexical tones are not represented unless they fall on an utterance particle. Lexical tones on utterance particles are given to disambiguate particles that differ only in tone. Particles under investigation are set in boldface. The convention used for glosses is as follows: ASP = aspect marker, ASRT = assertive particle; BPQ = polar question with a negative bias, POLQ = polar question particle, UP = utterance particle, WHQ = *wh*-question particle.

Crucially, the complexity of a speech act with force shift stems from the complexity of the force involved, as shown in the hierarchical organization in Figure 1.[4] In other words, a complex speech act involving force shift is complex because the sentential force component specifies a complex way of using a semantic content.

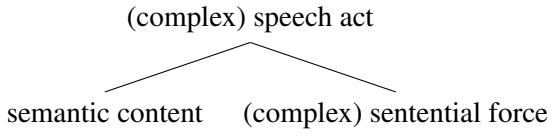

Figure 1: The complex force approach

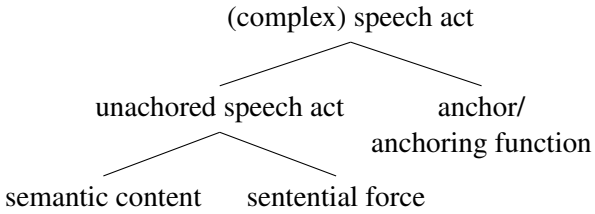

Figure 2: The anchoring approach

In the literature, another approach to force shift has been explored, in Gunlogson (2001) and Rudin (2018, to appear). In this approach, only a simple sentential force is involved, but a complex speech act may still be formed by a complex way of using an expression bearing the simple force. In other words, force shift does not stem from a complex way of using *content*, as in the complex force approach, but rather a complex way of using *force*.

According to this approach, combining a sentential force with a semantic content does not yield a full-fledged speech act. Rather, it yields an *unanchored speech act*, which requires the specification of a discourse participant or a set of discourse participants, referred to as an *anchor* in this paper, to yield a speech act. When there is no force shift, as in the case of (1) and (2), a speech act is anchored to the speaker, giving rise to a full-fledged speech act like an assertion or a question, as illustrated in the hierarchical organization in Figure 2 (anchoring functions will be introduced shortly). However, when force shift is present, a speech act is not anchored to the speaker, either because it is anchored to the addressee, as in Gunlogson (2001), or that it is simply left unanchored to any discourse participant, as in Rudin (2018, to appear). As a consequence, a pragmatic inference is activated, typically based on reasoning about alternative forms, that the speaker would like the addressee to confirm the commitment, resulting in force shift to a question.

Accordingly, both Gunlogson (2001) and Rudin (2018, to appear) adopt a hybrid semantic-pragmatic approach to model force shift, with the semantics handling anchoring and the pragmatics responsible for the shift in force. However, such a hybrid account is not a necessary feature of the anchoring approach. In fact, speech act anchoring is capable of generating force shift as a purely *semantic* phenomenon. The goal of the present paper is to develop a semantic approach to force shift in the anchoring framework with the help of particle clusters in Cantonese.

Following Gunlogson (2001) and Rudin (2018, to appear), we assume that sentential force, contributed by particles like *gaa3* and *ne1*, map a semantic content to an unanchored speech act. For concreteness, an unanchored assertion and an unanchored *wh*-question are defined in (5) and (6), both informally.

(5) Unanchored assertion (*S-gaa3*): $\lambda x.\ x$ asserts S

[4] In fact, complex force has been widely used outside of force shift, to model evidential markers (e.g., Murray 2010; Rett and Murray 2013; Bhadra 2017, 2020; Murray and Starr 2021) and many other discourse particles (e.g., Zimmermann 2009; Repp 2011).

(6) Unanchored question (*S-ne1*): $\lambda x.\ x$ asks S

However, instead of positing a pragmatic mechanism for deriving force shift, we derive force shift semantically. This is made possible by two essential assumptions. First, we argue that there is a natural link in force shift to polar questions and the nature of speech acts, namely, speech acts can be *defined* or *undefined* for an input context. In more formal terms, speech acts are *partial functions*, as recognized in a large body of research on the definedness conditions of speech acts (Austin 1962; Searle 1969; Searle and Vanderveken 1985; MacFarlane 2005, 2011; Condoravdi and Lauer 2012; Lauer 2013, a.o.). If there is compositionality at the force and speech act level, then the presence of speech act level operators that capitalizes on the partial nature of speech act functions is not surprising. In fact, we argue that *ho2* is precisely such an operator—it builds a polar question querying whether a speech act is defined or not.

In theory, building polar questions out of any speech act is achievable without assuming the presence of unanchored speech acts. However, unanchored speech acts are useful because they can be coupled with the second essential ingredient of our proposal— *anchoring functions*—to yield a powerful system of speech act anchoring. An anchoring function is a function that maps an unanchored speech act to a full-fledged, anchored speech act, essentially by determining who may serve as the anchor of a speech act and how. For concreteness, the anchoring function contributed by *ho2* is informally defined in (7). It maps an unanchored speech act A of any force to two speech acts, the act of performing A by the speaker, and the act of asking whether or not A can be performed by the addressee.

(7) λA. Spkr performs A; does Addr perform A or not?

In our formal definition (see section 3.3), an anchoring function is a quantifier over discourse participants scoping over unanchored speech acts, which are essentially (speech act) predicates of participants. It is worth noting that the space for anchoring functions is quite large. What we do in this paper is defend a particular anchoring function based on the empirical properties of particle clusters involving *ho2*. We briefly discuss, in section 4.4, what other anchoring functions are available for force shift to polar questions.

The remainder of this article is organized as follows: Section 2 introduces the reader to final utterance particles in Cantonese that may form a cluster with the particle *ho2* as well as their distributional and interpretive properties. Section 3 lays out the formal framework of speech act anchoring and extends it to simplex particles and *ho2* particle clusters in Cantonese. Section 4 shows that the analysis can be extended to explain a wider range of particles clusters as well as the role of context. Section 5 concludes.

2 The empirical landscape

In this section, we first introduce simplex final utterance particles in Cantonese that mark assertions and questions. Then, we introduce particles clusters involving simplex particles and the particle *ho2*, focusing on their interpretations and contexts of use. The upshot of the empirical discussion is two fold—the particle clusters are not only compositional in nature, they also suggest the possibility of operations on force-bearing expressions.

2.1 Simplex final particles in Cantonese

Broadly speaking, Cantonese distinguishes among at least three types of clauses: declaratives, interrogatives and imperatives. These clauses are often (but not always) marked by a particle occurring at the end of a sentence, sometimes known as a final utterance particle. Despite their optionality, native speakers strongly prefer the use of these particles in naturalistic speech and especially conversations (Law 1990; Luke 1990; Fung 2000, a.o.). For this reason, these particles are also called 'utterance particles' or 'discourse particles'. Like many other clause-tying devices, these particles occur in main clauses and are generally not allowed in subordinate clauses (Tang 1998; Law 2002).

Declaratives are marked with particles like *ge3*, *gaa3* or *aa3* and give rise to an assertive force. Generally, *ge3* and *gaa3* are used with stative predicates, as shown in (8), and are thought to be closely related variants. *Aa3* has a wider distribution, occurring in almost any assertion, as shown in (8) and (9), especially if the assertion is used as a response to a question. We do not go into the differences among these three particles in this study as they pattern alike in forming particle clusters with *ho2*. *Aa3* may also be used in various types of questions as well as in imperatives and exclamatives, a distribution we return to below and in section 4.2.

(8) Ziming sik haa (**ge3/gaa3/aa3**).
Ziming eat shrimp ASRT
'Ziming eats shrimp.'

(9) Ziming heoi-zo hokhaau (**aa3**).
Ziming go-ASP school ASRT
'Ziming went to school.'

Questions are marked by a range of final particles depending on the type of question involved. For example, a default polar question is accompanied by the particle *maa3*, as shown in (10). If the polar question carries a strong bias against the polarity of the prejacent proposition (i.e., the proposition corresponding to the question nucleus minus the question particle), the particle *me1* is used, as shown in (11) (see Lam 2014). Both *maa1* and *me1* are obligatory for a question interpretation–omitting them yields either a falling declarative or a polar question akin to a rising declarative in English.[5]

Ordinary polar question

(10) Nei jau sigaan **maa3**?
you have time POLQ
'Do you have time?'

Polar question with a bias

(11) Nei jau sigaan **me1**?
you have time BPQ
'Do you really have time? (I think not.)'

To mark a *wh*-question, an alternative question, or a so-called A-not-A question, the particle *ne1* or *aa3* may be used, as shown in (12) - (14).[6]

(12) Bingo sik haa (**ne1/aa3**)?
who eat shrimp WHQ
'Who eats shrimp?' *Wh*-question

(13) Ziming sik haa ding sik ju (**ne1/aa3**)?
Ziming eat shrimp or eat fish WHQ

[5] *Maa3* and *me1* are the primary polar question particles in Cantonese. The general purpose particle *aa3* can also be used to mark polar questions and will be discussed in section 4.2.

[6] Some have expressed doubts towards treating *ne1* as a question marker. For example, Law (1990) analyzes it as a marker of tentativeness.

'Does Ziming eat shrimp or fish?' Alternative question

(14) Ziming sik-m-sik haa (**ne1/aa3**)?
who eat shrimp WHQ
'Does Ziming eat shrimp?' A-not-A question

There are subtle differences between *ne1*-questions and *aa3*-questions. In particular, *ne1* patterns like its Mandarin correlate *ne* in being compatible with self-directed questions in trains of thought (see Guo 2009). *Aa3*-questions, on the other hand, are used when an addressee response is expected. This distinction is later shown to determine whether or not a question particle can form a cluster with *ho2* (see section 4.2).

Final particles in Cantonese have been analyzed as functional heads of ForceP, which roughly correspond to speech acts in semantics (Law 2002; Lam 2014; Tang 2015, 2020). However, the relationship between final particles and force is not a clean one-to-one correspondence (Luke 1990; Fung 2000; Sybesma and Li 2007; Lau 2019), much like the imperfect relationship between other clause-typing devices and force. Different final particles may be used to indicate the same force category (e.g. *maa3, ne1* and *aa3* all mark questions), possibly with slightly different flavors, while the same final particle may be compatible with different force categories (e.g. *aa3* can be used in assertions, questions, and imperatives). It is possible that these particles are not lexical realizations of the force category, but rather stand in relation to force as a more abstract category.[7]

Many of the simplex particles may form particle clusters with a variety of other final particles (Law 1990; Matthews and Yip 1994; Lam 2014; Tang 2015; Law et al. 2018). While some of these clusters preserve the force type, others trigger force shift. Since the central concern of this paper is force shift, we only take up particle clusters involving *ho2*, which invariably exhibit force shift, in the next three subsections.

2.2 ASSERT-HO clusters

It has been observed that simplex particles may form particle clusters with *ho2* (Lam 2014). In this subsection, we take up particle clusters involving *ho2* and a declarative particle. For simplicity, we have chosen the declarative particle *gaa3* to represent all declarative particles. As shown in (16)A, *gaa3* may form a particle cluster with *ho2*. Such a particle cluster marks a polar question, as evidenced by the felicity of the affirmative and negative answers in (16)B-i and (16)B-ii. In addition, the polar question carries a bias (which we later argue to be a commitment) towards the prejacent proposition, namely, that Ziming eats shrimp (Lam 2014). The presence of the bias component requires that the context admitting a *gaa3-ho*-question also carries a speaker bias towards the prejacent proposition. An example of such a context is given in (15).

(15) **Biased context**
Ziming was meeting his friends Annie and Bob for dinner at a seafood restaurant. Since he was running late, he asked his friends to help him make an order without specifying what he wanted. Annie remembered that Ziming ate shrimp but she wanted to confirm it.

[7] What is not possible, we think, is an analysis in which simplex particles are treated as content-level complementizers, such as treating *ne1* as an interrogative complementizer, à la Karttunen (1977), that turns a proposition into a set of propositions. Our refutation of this analysis is based on the observation that these particles resist embedding environments.

(16) A: Ziming sik haa **gaa3 ho2**?
Ziming eat shrimp ASRT HO
'Ziming eats shrimp. Right?'
B: (i) Hai aa3.
yes ASRT
'Yes.'
(ii) Mhai aa3.
no ASRT
'No.'

Following Lam (2014), we argue that a polar question with a *gaa3-ho2* cluster introduces a complex speech act. The complex speech act is derived not by letting *gaa3* and *ho2* form a complex force jointly operating on the semantic content of a proposition. Rather, it is derived by *ho2* operating on a force-bearing expression, as shown in Figure 3. The force-bearing expression, in this case, is an assertion predicate of discourse participants, generated by combining a proposition with the declarative particle *gaa3*.

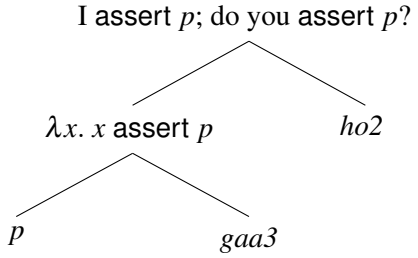

Figure 3: Anchoring an assertion

Ho2 provides two discourse participants as anchors for the assertion predicate. The anchoring yields a speech act with two components. The first part is basically a simple assertion by the speaker. The second part is a polar question querying whether or not the assertive act can be performed by the addressee. Such an analysis makes a few predictions.

To begin with, if *ho2* indeed operates on a force-bearing expression, the most straightforward prediction is that it should have a distribution distinct from simpler polar question particles operating on content. This prediction is borne out, by a comparison of the distribution of *ho2* and the polar question particle *maa3*. Concretely, while *ho2* may form a particle cluster with a declarative particle, as er we have witnessed in (16), *maa3* may not form such a cluster, as shown below:

(17) Ziming sik haa (*ge3/*gaa3/*aa3) **maa3**?
Ziming eat shrimp ASRT POLQ
'Does Ziming eat shrimp?'

The speaker-oriented assertive component makes a series of predictions. First, since a *gaa3-ho2* cluster requires that the assertive act must be performable by the speaker, it predicts that the speaker has a strong bias towards the proposition. This in turn predicts that the speaker cannot use a *gaa3-ho2* cluster with a proposition they do not believe, unless they intend to conceal their genuine private belief. For example, in the context in (18), the speaker Ziming believed that 3+3 does not

equal 7. For this reason, he could not use the *gaa3-ho2* polar question in (19-a) to challenge his son's answer. This contrasts with a rising declarative like (19-b), which is known to have a much weaker speaker bias and is acceptable in the smae context (see also Ward and Hirschberg 1985; Gunlogson 2008; Poschmann 2008; Lauer and Condoravdi 2012; Westera 2013; Northrup 2014; Malamud and Stephenson 2015; Krifka 2017; Farkas and Roelofsen 2017; Bhadra 2020).

(18) **Opposite bias**
Context: Ziming was checking his son's math homework and saw that his son incorrectly wrote 3+3 =7. To flag this problem, he asked (19-a).[8]

(19) a. #Saam gaa saam dengjyu cet **gaa3 ho2**?
3 plus 3 equal 7 ASRT HO
'Three plus three equals seven. Right?' *gaa3-ho2* question

b. Saam gaa saam dengjyu cet (**gaa4**)?
3 plus 3 equal 7 ASRT
'Three plus three equals seven?' rising declarative

Second, the performability of the assertive act by the speaker also predicts that after the performance of a *gaa3-ho2* polar question, the speaker cannot cancel the discourse commitment associated with the declarative particle *gaa3*. This is borne out by the unacceptable continuation in (20). Again, the stability of the discourse commitment stands in stark contrast with the weak speaker bias of an rising declarative, which is compatible with the same continuation, as shown in (21).

(20) Ziming sik haa **gaa3 ho2**? #Ngo jinwai m-hai.
Ziming eat shrimp ASRT HO I think not-yes
'Ziming eats shrimp. Right? I don't think so.'

(21) Ziming sik haa (**gaa4**)? Ngo jinwai m-hai.
Ziming eat shrimp ASRT I think not-yes
'Ziming eats shrimp? I don't think so.'

Third, the proposed analysis also predicts that in a neutral context without a speaker bias, as given in (22), a simple polar question like (22-b) is preferred to a *gaa3-ho2* polar question like (22-a), with the same propositional content.

(22) **Neutral context**
Context: Ziming was meeting his friends Annie and Bob for dinner at a seafood restaurant. Since he was running late, he asked his friends to help him make an order without specifying what he wanted. Annie was not sure whether Ziming ate shrimp or not. So, she asked a polar question.

a. #Ziming sik haa **gaa3 ho2**?
Ziming eat shrimp ASRT HO
'Does Ziming eat shrimp?'

b. Ziming sik haa **maa3**?
Ziming eat shrimp POLQ
'Does Ziming eat shrimp?'

[8] This question can be felicitous if Ziming tried to be sarcastic and pretend that he is committed to the incorrect answer.

Besides the predictions discussed above, the anchoring analysis also predicts that the complex speech act resulting from anchoring a force-bearing expression changes depending on the force involved. In the next subsection, we investigate two types of question particles that may form particle clusters with *ho2* to form particles clusters. It is shown that the interpretive properties of these clusters follow from the anchoring analysis. Imperatives are also compatible with *ho2*, with some caveat. They are deferred until section 4.2, along with polar questions and a special class of *wh*-questions.

2.3 QUESTION-HO clusters

2.3.1 *Me1-ho2*: questioning bias

To begin with, recall that *me1* is a polar question particle with a speaker bias towards the opposite bias of the prejacent proposition. For example, consider the *me1*-polar question in (23-a). When *ho2* is added to a *me1*-question, as in (23-b), a polar question is formed.

(23) a. Ziming sik haa **me1**?
Ziming eat shrimp BPQ
'Does Ziming really eat shrimp?'
b. Ziming sik haa **me1 ho2**?
Ziming eat shrimp BPQ HO
'Does Ziming really eat shrimp? Do you also wonder?'

According to the anchoring analysis, it is predicted that (23-b) is not a simple polar question about content. Rather, it is a polar question about force, or more precisely, a polar question about a force-bearing expression. The interpretation of such a force-level polar question is as follows:

(24) Complex speech act of a *me1-ho2* polar question
a. Speaker-oriented: The speaker can ask a *me1*-question.
b. Addressee-oriented: Can the addressee ask a *me1*-question?

This analysis predicts that unlike a *gaa3-ho2* cluster, a *me1-ho2* cluster does not encode speaker commitment towards the the prejacent proposition. This prediction is borne out by the fact that a *me1-ho2* question like (26-a) is acceptable in a context, like (25), in which the speaker has the bias towards the opposite polarity of the prejacent proposition. The same context fails to support a *gaa3-ho2* polar question, as shown in (26-b).

(25) **Confirming a bias**
Context: Ada told Bob and Cindy that Ziming eats shrimp, but Bob remembered otherwise. Bob believed that Cindy may share his belief, so he asked Cindy:

(26) a. Ziming sik haa **me1 ho2**?
Ziming eat shrimp BPQ HO
'Does Ziming really eat shrimp? Do you also wonder?'
b. #Ziming sik haa **gaa3 ho2**?
Ziming eat shrimp ASRT **ho**
'Ziming eats shrimp. Right?'

The analysis also predicts that as a polar question, a *me1-ho2*-question should be answerable by an affirmative and negative answer. More precisely, given that it is a polar question about force, rather than a polar question about content, we should expect an affirmative answer to indicate an agreement with the biased question or with the bias. This is indeed the case, as illustrated in (28-a), in which the affirmative particle *hai* roughly corresponds to *yes* or *right* in English. A negative answer is also possible, though it does not merely indicate that a *me1*-question is unperformable, but also that the addressee holds the opposite belief, as shown in (28-b).

(27) Ziming sik haa **me1 ho2**?
Ziming eat shrimp BPQ HO
'Does Ziming really eat shrimp? Do you also wonder?'

(28) a. Hai lo1. Keoi sik haa me1? / Keoi mingming m-sik haa gaa3.
yes UP he eat shrimp BPQ / he as.remembered not-eat shrimp ASRT
'Right. Does he really eat shrimp? / He doesn't eat shrimp, from what I remember.'
b. M-hai aa3. Keoi sik haa gaa3.
not-yes UP he eat shrimp ASRT
'No, he eats shrimp.'

The fact that an affirmative answer confirms the bias associated with *me1* and a negative answer does the opposite is primary due to the presence of *ho2*. When *ho2* is absent, an affirmative answer and a negative answer in (30-a) and (30-b) do just the opposite as a response to the *me1* polar question in (29).

(29) Ziming sik haa **me1**?
Ziming eat shrimp BPQ
'Does Ziming really eat shrimp?'

(30) a. Hai aa3. Keoi sik haa gaa3.
yes UP he eat shrimp ASRT
'Yes, he eats shrimp.'
b. M-hai aa3. Keoi m-sik haa gaa3.
not-yes UP he not-eat shrimp ASRT
'No, he doesn't eat shrimp.'

The interpretation of the answers is expected if a *me1*-question is a polar question about content: an affirmative answer confirms the prejacent proposition and the negative answer confirms just the opposite. This contrasts with a *me1-ho2*-question: an affirmative answer confirms not the prejacent proposition, but the biased *me1*-question, and the negative answer confirms not the opposite of the prejacent proposition, but the opposite of the bias associated with *me1*.

2.3.2 *Wh*-questions with *ne1*

As briefly mentioned in section 2.1, Cantonese uses the particle *ne1* (and its variant *le1*) to mark A-not-A interrogatives, alternative interrogatives, and *wh*-interrogatives. All of these interrogatives are compatible with *ho2*.[9]

[9] *Maa3*-polar questions and *aa3*-questions are generally not acceptable with *ho2*. However, the acceptability can be remedied by a mechanism known as addressee shift, which we discuss in section 4.2.

(31) Ziming sik-m-sik haa **ne1** **ho2**?
Ziming eat-not-eat shrimp WHQ HO
'Does Ziming eat shrimp or not? Do you wonder?' ANAQ-*ho*

(32) Ziming sik haa ding sik jyu **ne1** **ho2**?
Ziming eat shrimp or eat fish WHQ HO
'Does Ziming eat shrimp or fish? Do you wonder?' ALTQ-*ho*

(33) Bingo sik haa **ne1** **ho2**?
who eat shrimp WHQ HO
'Who eats shrimp? Do you wonder?' WHQ-*ho*

The well-formedness of these questions directly challenges a complex force analysis in which *ho2* operates on the semantic content. In particular, while the propositional content in a *gaa3*-assertion or a *me1*-question can arguably be turned into a polar question by *ho2*, it is much less straightforward how the *wh*-interrogative content in a *ne1*-question can be turned into a polar question.

By contrast, a *ne1-ho2* cluster is expected given the anchoring semantics of *ho2*. According to the anchoring analysis, a *ne1-ho2* cluster gives rise to a complex speech act, namely, a polar question about the question force associated with *ne1*. This complex speech act has two parts, as summarized in (34).

(34) Complex speech act of a *ne1-ho2* polar question
a. Speaker-oriented: The speaker can ask a *ne1*-question.
b. Addressee-oriented: Can the addressee ask a *ne1*-question?

A *ne1*-question is a *wh*-, alternative, or A-not-A question, so it carries neither a commitment, like *gaa3*, nor a bias, like *me1*. Instead, it carries the force of an ordinary question. Accordingly, the speaker-oriented component predicts that a *ne1-ho2* question can only be performed in a context in which the speaker may perform just the *ne1*-question. For example, in a context like (35), in which a speaker has just revealed the answer to a *ne1*-question, they can neither ask the *ne1*-question, as shown in (36-a), nor the corresponding *ne1-ho2*-question, as shown in (36-b).

(35) **Answer has been revealed**
Ada told Bob that Ziming was the only one at the department who went to a conference. Right after saying this, she asked Bob:

(36) a. #Bingo heoi-zo wuiji **ne1**?
who go-Asp conference WHQ
'Who went to the conference?'
b. #Bingo heoi-zo wuiji **ne1** **ho2** ?
who go-Asp conference WHQ HO
'Who went to the conference? Do you also wonder?'

If a *ne1-ho2*-question's speaker-oriented component is responsible for its similarity to a *ne1*-question, its addressee-oriented component sets it apart from the latter. More specifically, a *ne1*-question is a *wh*-question, while a *ne1-ho2* question is a polar question about the performability of a *wh*-question. Generally speaking, a speaker uses a neutral, information-seeking question to signal their ignorance and possibly also request an answer. The context in (37) is one that supports

a default question marked by *ne1*. In such a context, *ho2* is generally not acceptable.[10]

(37) **Only the speaker was confused**
Context: A famous scientist gave a talk on astrophysics. Ada, as a layman, could not follow the talk. Ada's friend Beth was an astrophysicist, and it seemed to Ada that Beth understood the talk very well. Ada hence asked Beth:

a. Keoi gong me **ne1**?
he say what WHQ
'What did he say?'

b. #Keoi gong me **ne1** **ho2**?
he say what WHQ HO
'What did he say? Do you also wonder?'

The infelicity of (37-b) is expected. The *ne1-ho2*-question asks Beth about her performability of the *ne1* question act. In a normal context, such a performability question can be asked only when the speaker thinks it is an unsettled issue. For this reason, (37-b) is infelicitous because the speaker Ada believed that the addressee Beth knew the answer, and hence the lower *ne1*-question act is not performable by Beth.

On the contrary, in a context like (38), where the speaker suspects that the addressee also may not know the answer to a lower *ne1*-question, then a *ne1-ho2*-question can be felicitously used, as shown in (38-a). As expected, a *ne1*-question is dis-preferred.[11]

(38) **Both the speaker and the addressee were confused**
Context: A famous scientist gave a talk on astrophysics. Ada, as a layman, could not follow the talk. Ada's friend Beth was also a layman, and it seemed to Ada that Beth did not understand the talk either. Ada asked Beth:

a. #Keoi gong me **ne1**?
he say what WHQ
'What did he say?'

b. Keoi gong me **ne1** **ho2**?
he say what WHQ HO
'What did he say? Do you also wonder?'

The speech act anchoring analysis also predicts that a *ne1-ho2*-question should differ from a *ne1*-question in terms of the answers it may receive. Observe that a *ne1*-question like (39) may receive, among other possibilities, a fragment response like (40-a) or an ignorance response like (40-b).

(39) Bingo sik haa **ne1**?
who eat shrimp WHQ
'Who eats shrimp?'

[10] If *ne1-ho2* is used, A would be trying to get B to explain the content of the talk without admitting that B was in a privileged position to explain it.

[11] This is assuming Ada did not have the obnoxious intention of embarrassing Beth with her inability to answer the *ne1*-question.

(40) a. Ziming aa3.
Ziming ASRT
'Ziming.'

b. Ngo mzi aa3.
I not.know ASRT
'I don't know.'

Embedding a *ne1*-question under *ho2*, as in (41), leads to a change in the range of felicitous responses, as shown in (42).

(41) Bingo sik haa **ne1 ho2**?
who eat shrimp WHQ HO
'Who eats shrimp? Do you wonder?'

(42) a. ??Ziming aa3.
Ziming ASRT
'Ziming.'

b. ??Ngo m-zi aa3.
I not-know WHQ
'I don't know.'

c. Ziming lo1.
Ziming UP
'Ziming.'

d. Hai lə1. (Ngo dou m-zi.)
yes UP I also not-know
'Right. I also don't know.'

Note first that both the fragment response and the ignorance response are not felicitous, as shown in (42-a) and (42-b). This is likely because the particle *aa3*, when used in a declarative clause, yields an assertion requiring close relevance to the question under discussion (Sybesma and Li 2007). If the addressee wants to indicate that they may not perform the *ne1*-question because, for example, they know the answer to the question, then they can offer a fragment response with the particle *lo1*, as shwon in (42-c). The particle *lo1* is used to indicates that the assertion is a response to a question that does not need to be asked. If the addressee wants to indicate that they may also perform the *ne1*-question, then they need to use an affirmative particle *hai* followed by the particle *lə1*, as shown in (42-d). The fact that an affirmative particle can be used is a telltale sign that a *ne1-ho2* question is a polar question (about force) rather than a *wh*-question.

Besides, a negative answer to (41) is also possible when accompanied by an appropriate final particle, as shown below:

(43) M-hai {lo1/#aa3}. Ngo m-seong zi.
not-yes UP/UP I not-want know
'No. I don't want to know.'

We do not know why the use of *aa3* in (43) is unacceptable. However, the fact that it is possible to use a negative answer as a response indicates that a *ne1-ho2*-question share important similarities with a polar question.

2.4 Interim summary

We have seen that the simplex particles indicating assertions (*gaa3*), biased polar questions (*me1*), and *wh*-questions (*ne1*) may all form clusters with the polar interrogative particle *ho2*. When *ho2* is absent, the simplex particles contribute basic speech acts, as summarized in the left-hand side of Figure 4. When *ho2* is present, these speech acts are turned into complex acts of polar questions, querying whether or not these speech acts are performable by the addressee, as shown in the right side of Figure 4.

p-gaa3 (decl.)	assertion		questioning assertion
p-me1 (int.)	biased question	$\xRightarrow{ho2}$	questioning biased question
Q-ne1 (int.)	neutral question		questioning neutral question

Figure 4: Force shift with *ho2*

We have provided evidence from the interpretative of particle clusters involving *ho2* that the complex speech acts do not arise from a complex force operating on semantic content. Rather, they arise from anchoring a force-bearing expression, an unanchored speech act, to the speaker and the addressee, in distinct ways. One one hand, it requires that the speech act to be performable by the speaker as an anchor. On the other hand, it produces a polar question polar question asking an addressee to confirm whether or not the speech act is performable by them.

In the next section, we demonstrate how this operations on force-bearing expressions can be implemented in a framework of speech act anchoring.

3 Proposal

We propose that *ho* embeds a force-bearing expression. What should be the meaning of a force-bearing expression? In one approach, the meaning is a speech act, modeled as a context change potential (see Farkas and Bruce 2010; Rawlins 2010; Davis 2011; Northrup 2014; Malamud and Stephenson 2015; Farkas and Roelofsen 2017; Bledin and Rawlins 2019; Bhadra 2020). A context change potential is a relation between two contexts, or a function from contexts to contexts. On this view, a force-bearing expression, once fed an input context, generates a set of output contexts (or another output context).

However, in the approach of Gunlogson (2001), Davis (2009), Portner (2007, 2009), and Rudin (2018), speech acts are generated in a *multi-step* fashion. A simple force-bearing expression does not directly yield a speech act, but a function from discourse participants to speech acts (type $e\mathsf{T}$, where T is the type for speech acts). These functions are referred to as *unanchored speech acts* in this paper. Unanchored speech acts can be turned into (anchored) speech acts by taking a discourse participant as their argument, as proposed in Gunlogson (2001) and Rudin (2018).

In this study, we capitalize on the multi-step approach to model force shift. In particular, we argue for the presence of *anchoring functions*, which take unanchored speech acts and turn them into anchored speech acts. Since there is no guarantee that the force associated with an unanchored speech act is the same type of force associated with the corresponding anchored speech act, force shift is a theoretical (and empirical) possibility.

We expand on this proposal in a few steps. In section 3.1 below, we discuss the semantics for simplex particles , treating them as functions from discourse participants to speech acts. Then, in section 3.3 analyze *ho2* as a discourse participant function that take unanchored speech acts and return anchored speech acts.

3.1 Context and speech acts

Many studies have defined a discourse context as a tuple consisting of various conversational components, like a Stalnakerian context set, a set of discourse participants, commitment sets of the

participants, a stack of issues, and many other components (Stalnaker 1978, Gunlogson 2001, 2008, Farkas and Bruce 2010, Davis 2011, Ginzburg 2012, Roberts 2012, Malamud and Stephenson 2015, Bhadra 2020, among others.) Since not all of the conversational components are useful for our purposes in this paper, we define a context as a tuple consisting of a set Part of discourse participants, as well as the discourse commitment sets (DC) of all discourse participants (x, y, z, etc.) involved in the context:

Definition 1 (Context)
A context c is a tuple of $\langle \mathsf{Part}^c, \mathsf{DC}^c_x, \mathsf{DC}^c_y, ... \rangle$

A discourse commitment set DC^c_x represents a set of propositions that the individual x is committed to (Gunlogson 2001, a.o.), as shown in definition 2.

Definition 2 (Discourse commitment set)
$\mathsf{DC}^c_x = \{p \mid x \text{ is committed to } p \text{ in } c\}$

There are many proposals on what it means to have a discourse commitment towards a proposition (Searle 1969, 1979; MacFarlane 2005, a.o.). We take a discourse commitment to indicate a certain set of communicative consequences or effects associated with assertive acts. For concreteness, we follow MacFarlane (2011) and take a speaker's willingness to withdraw (if proven wrong), justify, and be responsible for a proposition to indicate that the proposition is a discourse commitment of the speaker's.

Intersecting all the discourse commitment sets yields the common ground of the context c, i.e., a set of propositions to which all discourse participants are publicly committed, as shown in 3.

Definition 3 (Common ground)
$\mathsf{CG}^c = \cap\{\mathsf{DC}^c_x \mid x \in \mathsf{Part}^c\}$

Against this backdrop, we are ready to introduce speech acts. Following many earlier studies, we define a speech act as a relation between two contexts drawn from the domain of contexts C. This is the same conception as a proposition in Dynamic Predicate Logic (Groenendijk and Stokhof 1991).

Definition 4 (Speech act)
A speech act $\mathbb{A}$ is a relation in the domain of contexts: $\mathbb{A} \subseteq C \times C$.

We take speech acts to be partial. That is, a speech act is undefined for pairs of contexts that do not satisfy its definedness conditions. This is an important assumption that interacts with our semantics for force shift—that force shift from any speech act to a polar question is possible is because contexts can be divided into two classes for any speech act: those that are defined for the act and those that are not. We discuss specific definedness conditions associated with different speech acts when we define force operators. Here, we only illustrate what it means for a speech act to be partial.

Suppose the domain of contexts has three contexts c_1, c_2 and c_3 and a hypothetical speech act $\mathbb{A}$ corresponds to the context change potential defined in (44).[12]

[12] When a speech act is performed relative to a set of input contexts among which some contexts are undefined, an accommodation mechanism kicks in to eliminate the defined input contexts. Only the outputs from defined inputs are collected and stored as a set.

(44) $\mathbb{A} = [\, c_1 \rightarrow \{c_1, c_2\},\ \ c_2 \rightarrow \{c_2\},\ \ c_3 \rightarrow \text{undefined}\,]$

The information potential of a speech act lies in its ability to generate different output contexts, or none at all, depending on different input contexts. For example, evaluating $\mathbb{A}$ relative to c_1 and c_2 produces defined but different output contexts. However, evaluating it relative to c_3 is undefined and hence generates no output contexts (not even the empty set). For this reason, not only is it informative to know how a speech act changes a context (when defined), it is also informative to know whether or not a speech act is defined for an input context.

At the heart of our semantic approach to force shift is precisely this notion of informativity: to shift a sentential force into a polar question is to ask whether or not a speech act associated with the sentential force can be carried out. Since we will make use of the set of contexts that do not support a speech act when defining *ho2*, let us introduce the notion of a failure set (FailSet) for a speech act $\mathbb{A}$ below:

(45) $\mathsf{FailSet}(\mathbb{A}) := \{c \mid \mathbb{A}(c) \text{ is undefined}\}$

It is reasonable to assume that if a context is identified to be in the FailSet of a speech act, the preferred strategy is to not perform the speech act if there is a choice.

In anticipation of lexical definitions and compositionality, the basic types used in this paper are listed in table 1. Function types $(\alpha\beta)$ built from any type α and β are exemplified in table 2.

Object	Type
individual	e
possible world	s
truth value	t

Table 1: Basic types

Object	Type	Abbrev.
proposition	(st)	
context	$(et) \times (st) \times \ldots \times (st)$	c
context change potential	$(\mathsf{c}(\mathsf{c}t))$	T

Table 2: Function types

3.2 Force operators

Having set up the formal backdrop for speech acts, we are now ready to get into the lexical details of force operators, which help build speech acts. Generally speaking, we take basic particles like *ge3*, *ne1*, and *aa3* as force operators mediating between semantic content and speech acts. More specifically, declarative particles like *ge3* and *gaa3* correspond to the assertion operator **assert**, as defined in (46).

(46) $\textbf{assert} := \lambda p \lambda x \lambda c.\{c' \mid c[\mathsf{DC}_x]c' \wedge \mathsf{DC}_x^c \cup \{p\} = \mathsf{DC}_x^{c'}\}$ Type: $((st)(e\mathsf{T}))$
if $\mathsf{DC}_x^c \cap \{p\} \neq \emptyset$, undefined **otherwise**

(47) $c[X]c'$ = 1 iff c' differs from c at most with respect to the component X.

It can be seen as a performance predicate expressing how an individual x updates an input context c with a proposition p. Formally speaking, **assert** is a function mapping an individual and a proposition to a context change potential (see Gunlogson 2001 and Davis 2011 for a similar assertion operator in a update semantics-style dynamic framework).

According to (46), asserting a proposition p creates two types of discourse effects. First, it maps an input context c to a set of output contexts c' where x's discourse commitment set is

incremented by p while all other discourse components in c are left unchanged.[13] In other words, an assertion commits x to p. Second, an assertive act is a partial relation, which is only defined for input contexts that may yield consistent outputs. For example, to felicitously assert a proposition p in a context c requires that the speaker discourse commitment set in c, i.e., DS_x^c, to not contain propositions that would conflict with p.

The partiality of **assert** means that for any input context c, it may be defined or undefined for an assertion. If it is defined, then we should expect the speech act to be performed successfully. However, if it is undefined, then the performance fails.

It is worth noting that we do not take an assertion operator to be hard-coded with an addressee-oriented successful condition, namely, that an addressee becomes convinced and as a consequence adds the associated proposition to the common ground. This is because plenty of assertions do not succeed in convincing the intended addressees (see Clark 1992; Farkas and Bruce 2010). Nor do we build the proposal nature of an assertion into the assertive operator, as Farkas and Bruce (2010) do. This decision is made based on two reasons. First, assertive particles like *ge3* and *gaa3* are compatible with self-directed speech (i.e., self-addressed assertions in monologues) while the assertive use of the particle *aa3* is not. So, we are led to believe that assertions are more modular in nature in having separate speaker-oriented and addressee-oriented components (see also Beyssade and Marandin 2006). Second, many scholars have proposed that addressee-oriented inferences can be computed as an implicature (Lauer 2013; Krifka to appear).

Next, we turn to the interrogative final particle *ne1*, which marks interrogatives except polar ones. We take this particle to correspond to **quest**, an operator that maps an individual and an interrogative meaning to a question act, as defined in (48). In this study, we follow Hamblin/Karttunen's approach (Hamblin 1973; Karttunen 1977) and assume that the semantic content of an interrogative clause denotes a set Q of propositions. In addition, we follow Krifka (2015) and define a question act in terms of a set of possible assertion acts. That is, each proposition p in the set Q can potentially be used to update some discourse participant y's discourse commitment set.

(48) $\textbf{quest} := \lambda Q \lambda x \lambda c.\{c' \mid \exists p \in Q.\exists y \in \mathsf{Part}^c : c' \in \textbf{assert}(p)(y)(c)\}$ Type: $(((st)t)(e\mathsf{T}))$
if $\forall p \in Q : p \notin \mathsf{DC}_x^c$, undefined **otherwise**

Besides, the definedness condition of a question act is that the speaker has not added p to their discourse commitment set so far.[14] This is a fairly weak definedness condition as it does not require that the speaker does not know the answer to the question. Rather, it merely require a form of 'public ignorance'. As with assertions, we leave open the possibility that question acts come with more definedness conditions.

Despite the connection with the assertion operator, the question operator differs from the latter in a few important ways:

1. The update coming from a question act is non-deterministic, in the sense that not all discourse commitment sets in different contexts are enriched with the same proposition, unlike the case with an assertion. What this means is that all the propositions in the set denoted by the inter-

[13] As widely assumed, adding a proposition p to a commitment set DC must be guaranteed to be compatible, i.e., $\cap(\mathsf{DC} \cup \{p\}) \neq \emptyset$.

[14] This is likely too strong. A weaker alternative requirement is that p has not been *recently* added to the speaker's discourse commitment set.

rogative content are live possibilities after a question act, a spirit shared by many approaches to question dynamics (see also Bhadra 2017; Farkas and Roelofsen 2017).

2. While an assertion by the speaker targets their own discourse commitment set, a question may (but need not) target the discourse commitment set of someone other than the speaker. Normally, there is no requirement on who should answer a question. However, certain questions have a designated addressee-oriented use and are marked by a different question particle in Cantonese. Section 4.2 explains why *ho* clusters involving those particles are unacceptable.

Based on the partiality of the question operator, there are two classes of input contexts, those that can support successful performance of a question act and yield true transitions, and those that cannot support successful performance of the act. What set them apart is whether or not they meet the definedness condition for performing a question act.

In a similar fashion, an opposite bias polar question operator can be defined to capture the interpretation of the particle *me1*, which shows a bias opposite to the polarity of the prejacent proposition.[15]

(49) $\textbf{ob-quest} := \lambda p \lambda x \lambda c.\{c' \mid \exists y \in \mathsf{Part}^c : c' \in \textbf{assert}(p)(y)(c) \vee c' \in \textbf{assert}(\neg p)(y)(c)\}$
if $\forall q \in \{p, \neg p\} : q \notin \mathsf{DC}_x^c$, **and** $\neg p \in \mathsf{Dox}_x^c$,
undefined **otherwise** Type: $((st)(e\mathsf{T}))$

Like ordinary questions with *ne1*, a biased polar question is only felicitous when the speaker has not made public what the answer to the question is, as indicated in the first definedness condition in (49). Despite this similarity, a biased question with *me1* differs from a neutral question with *ne1* in two important respects. First, like an assertion operator, it combines with a proposition. It yields a set of propositions by operating on the polarity of the proposition. A polar question can be formed by suggesting that some participant's discourse commitment set should either be updated by the positive proposition or the negative proposition. Second, a negative biased polar question carries a bias. In the case of *me1*, there is a bias towards the opposite of the polarity of its prejacent, as reflected in the second not-at-issue component in (49). This component requires that $\neg p$ is in the speaker's doxastic domain.

3.3 *Ho2* as a speech act anchoring function

We have defined a force operator as a binary function mapping a semantic content and a discourse participant to a context change potential. That is, for each pair of contexts representing a context transition, it specifies how a discourse participant may use a content to induce the discourse effects responsible for the context transition.

When fed a semantic content, the binary force operator yields a unary force operator from discourse participants to context change potentials. This kind of unary force operator, we argue following Gunlogson (2001), Davis (2011), and Rudin (2018), is an important building block of complex speech acts in natural language. We refer to it as an *unanchored speech act* and use the variable A to stand for it (cf. $\mathbb{A}$, for anchored speech acts). Its general definition and type are given in (50). When all the felicitous conditions associated with the context change is met, the transition is successful.

[15] For simplicity, we define Dox_x^c as follows: $\{p \mid x \text{ believes } p \text{ in } c\}$.

(50) $A := \lambda x \lambda c.A(x)(c)$ Type: $(e\mathsf{T})$

To put simply, an unanchored speech act specifies the designed discourse effects, i.e., the force, without specifying for whom these effects should hold. For example, the assertive force associated with the declarative clause type specifies that someone's discourse commitment should be updated, but leaves it open as to which discourse participant is involved (Gunlogson 2001; Davis 2011).

Intuitively, there are two participants involved in a discourse that may serve as an argument, or as an anchor, to an unanchored speech act—the speaker and the addressee. In Gunlogson (2001), the falling and rising final intonation contours specify whether the participant involved in an assertion is the speaker (in the case of the falling intonation) or the addressee (in the case of the rising intonation) (cf. Gunlogson 2008). In Portner (2009), an imperative denotes an unanchored speech act waiting to combine with the addressee.

In this study, we argue that an unanchored speech act may not only take a participant argument, it may itself serve as an argument for an *anchoring function*, which is a function that maps unanchored speech acts to anchored speech acts. Cantonese *ho2* is an instance of a complex anchoring function. Specifically, we propose that *ho2* combines with an unanchored speech act and anchors it to *both* the speaker and the addressee to return a (complex) speech act, defined as in (51). Note that s and a refer to the speaker and the addressee in a conversational context, respectively. It is more accurate to understand them as projection functions that extract the relevant speaker and addressee from a context c (written as a subscript on s and a in the definition).

(51) $[\![\text{ho}]\!] = \lambda A \lambda c.\bigcup \begin{cases} \{c' \in A(\mathsf{a}_c)(c'') \mid c'' \in A(\mathsf{s}_c)(c)\} & ❶ \\ \{c' \in \mathsf{FailSet}(A(\mathsf{a}_c)) \mid c' \in A(\mathsf{s}_c)(c)\} & ❷ \end{cases}$ Type: $((e\mathsf{T})\mathsf{T})$

- ❶ c' is an output given by A performed by the speaker and the addressee sequentially;
- ❷ c' is an output given by A performed by the speaker and not supporting the addressee's performance of A.

The anchoring is complex in two respects. First, it involves anchoring a speech act to both the speaker and the addressee. In this respect, it is similar to the particle *yo* in Japanese, which attributes discourse effects from unanchored speech act to *all* participants in a discourse (Davis 2011). Note that the complexity of a speech act anchored to both the speaker and the addressee can be quite straightforward. It can be deemed as a sequential performance of two speech acts of the same type, one by the speaker and one by the addressee. A particle cluster involving *ho2*, however, is complex because the same unanchored speech act, generates different types of speech acts for different discourse participants:

1. The first part is a speaker-oriented component anchoring a speech act to the speaker. This component is relatively simple—*ho2* merely maps a input context c to a set of output contexts c' encoding the successful performance of a speech act by the speaker, as long as the input context is defined for the act. Since the speaker-oriented component is evaluated first, it generates a set of output contexts for evaluating the second component of a complex speech act with *ho2*.

2. The second part is an addressee-oriented component representing a *polar question* about whether or not the unanchored speech act can be anchored to the addressee to generate a full-fledged

speech act. This act is evaluated relative to input contexts that are the output contexts of evaluating the speaker-oriented act. Given that this is a polar question, there are two possible output contexts for any input context.[16] If it is a defined context for the addressee to perform the act, it is performed; however, if it is not a defined context for the addressee to perform the act, as indicated by the condition $c' \in \mathsf{FailSet}(A(\mathsf{a}_c))$, then nothing is done and the input context becomes the output context.

The definition of *ho2* in (51) can be visualized as in Figure 5. For any input context c, it is mapped to c'' (or its alphabetical variant c'_2) if c supports the performance of the speech act A by the speaker s_c. Then, there is a point of departure depending on whether c'' also supports the performance of the speech act A by the addressee a_c. If c'' supports it, then a new output c'_1 is generated. However, if c'' does not support the performance of A by the addressee, then c'' itself is chosen as the output context. A complex speech act involving *ho2*, according to this definition, involves two sequentially performed speech acts. The first act is a simple performance of the speech act by the speaker while the second act is a question about the performability of the act by the addressee.

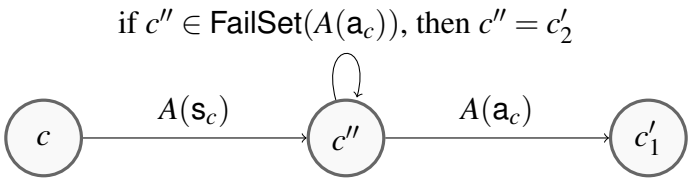

Figure 5: Context update with *ho2*

Ho2 as an anchoring function is of type $((e\mathsf{T})\mathsf{T})$ and can be strictly more expressive than discourse participants, which are taken to have the type e. The relationship between discourse participants and anchoring functions mirrors the relationship between individuals (type e) and individual quantifiers (type $((et)t)$) in static quantifier semantics. The presence of anchoring functions should not come as a surprise if discourse participants themselves play any role in compositional semantics, as suggested in studies like Speas and Tenny (2003), Gunlogson (2001) and Davis (2011). After all, they are just higher-order discourse participants, or dynamic quantifiers.

The force-transforming capacity of *ho2* can also be gleaned from its type. A function from an unanchored speech act $(e\mathsf{T})$ to an anchored speech act T is a function capable of transforming the speech act in the process of anchoring it as long as there is no requirement that the input T and the output T have the same force type.

What kinds of force transformation is allowed? Without constraints, any force type can in principle be transformed into another force type. This may indeed be desirable, as indirect speech acts are robust (Beyssade and Marandin 2006) and many simple forces have been analyzed as consists of even more primitive forces (Searle and Vanderveken 1985; Lauer 2013; Krifka to appear).

[16] Not all studies model polar questions as a set of two possibilities. For example, Bolinger (1978), Gawron (2001), Van Rooy and Safarova (2003), Biezma (2009), Biezma and Rawlins (2012), Roelofsen and Farkas (2015), Bhadra (2020) treat polar questions as consisting of a singleton answer, while earlier studies like Hamblin (1973) treat them as consisting of both positive and negative answers. We are not committed to a particular treatment of polar questions in this study. If polar questions turn out to be more amendable to a singleton analysis, the analysis proposed here can be recast along the lines of the singleton approach.

However, we think the decision should be empirically informed. Since commonly attested force shifts yield polar questions, we believe there is something very natural about shifting any force to a polar question. We attribute this naturality to the fact that most speech acts, if not all, are partial. For this reason, trying to find out whether a context is defined or undefined for a speech act is an informative move and it is essentially the discourse function of *ho2*. In other words, we can make sense of why *ho2* is so readily compatible with any force type—any force type yields speech acts that may be defined or undefined for a given input context. Of course, if there are force types that are incompatible with *ho2*, then they provide an important testing ground for the present proposal. We investigate these cases in section 4.

In the next two subsections, we show in more detail how the proposed speech act anchoring semantics for *ho2* interact with force-indicating utterance particles in Cantonese to yield the desirable semantics for relevant particle clusters.

3.3.1 Modeling ASSERTION-HO clusters

Let's use (52) as an example to demonstrate how the definition of *ho2* in (51) captures clusters involving *ho2* and a declarative particle like *gaa3*. Assuming that *gaa3* is an assertion operator, it first combines with a proposition to yield an unanchored assertion, a function from discourse participants to context change potentials. *Ho2* as a speech act anchoring function then combines with this unanchored assertion to yield not a simple anchored assertion involving only one participant, but a complex speech act anchored to both the speaker and the addressee , as shown in (53).

(52) Ziming sik haa **gaa3 ho2**?
Ziming eat shrimp ASRT HO
'Ziming eats shrimp. Right?'

(53) $[\![\text{ho}]\!](\textbf{assert}\ ([\![\text{Ziming eats shrimp}]\!])) =$

$$\lambda c.\bigcup \begin{cases} \{c' \in \textbf{assert}([\![\text{Z-E-S}]\!])(\mathsf{a}_c)(c'') \mid c'' \in (\textbf{assert}([\![\text{Z-E-S}]\!])(\mathsf{s}_c))(c)\} \\ \\ \{c' \in \mathsf{FailSet}(\textbf{assert}([\![\text{Z-E-S}]\!])(\mathsf{a}_c)) \mid c' \in (\textbf{assert}([\![\text{Z-E-S}]\!])(\mathsf{s}_c))(c)\} \end{cases}$$

The complex speech act has a speaker oriented component and a addressee-oriented component. The speaker oriented component is a assertion act anchored to the speaker, which generates a set of output contexts for any input context defined for the assertion. The addressee-oriented component is a polar question act enquiring how the addressee would choose to change the contexts transmitted from the assertion anchored to the speaker. The polar question offers two options—to move to a context c' in which the addressee also successfully performs the assertion ($c' \in \textbf{assert}([\![\text{Z-E-S}]\!])(\mathsf{a})(c'')$), or to stay in c'' if the assertion act is undefined for the addressee ($c' \in \mathsf{FailSet}(\textbf{assert}(p)(\mathsf{a}_c))$; note that in this case c' is identical to c'').

Both options discourse moves are informative. Moving to an output context in which the addressee successfully performs the assertion is informative because the output context has a newly added discourse commitment by the addressee. Staying put in an output context generated by performing the speaker-oriented assertion is also informative. In particular, an assertion by the addressee fails for an input context if the addressee has discourse commitments in the context that contradict the asserted proposition. So, identifying that an output context belongs in FailSet is a confirmation that the addressee has a contradictory belief.

Putting these two options together, the particle *ho2* creates a question out of an assertion by tapping into the definedness condition of the assertion. Since an input context either yields a defined transition or an undefined transition, the question thus created is a polar question. The polar question can be answered just like any other polar question, with an affirmative answer or a negative answer. However, since this is not a polar question about content, but a polar question about assertability of content, the answer strategy requires some explanation. Empirically, the range of possible answers, as discussed in section 2.2, is repeated below in (54).

(54) a. Affirmative: Hai aa3. 'Yes.'
b. Negative: M-hai aa3. 'No.'
c. Ignorant: Ngo mzi wo3. 'I don't know.'

Here, an affirmative answer amounts to performing the assertion by the addressee.[17] A negative answer undergoes strengthening. It does not only indicate the addressee cannot perform an assertion, but also that the addressee asserts the opposite propositional content.

A response indicating ignorance is also possible. We take it to signal that the assertion by the addressee is undefined. To model this, an assertion operator needs to have an extra definedness condition, such as the willingness to serve as the source of a proposition or to substantiate the proposition when it is challenged (Gunlogson 2008; MacFarlane 2011). We largely leave open how extra definedness conditions of assertions should be modeled in this study. However, it is worth noting that if the present enterprise of constructing speech act-level questions from definedness conditions of speech acts is on the right track, we should expect interactions of felicitous conditions and speech act-level questions. In section 4.2, we explore some of these consequences using question acts with more definedness conditions.

3.3.2 Modeling QUESTION-HO clusters

This section demonstrates how the proposed analysis accounts for the interpretive properties of *ho* attaching to questions. Consider (55), repeated from (33). Based on the assumption that *ho* combines with an unanchored speech act, the question in (55) can be interpreted as (56).

(55) Bingo sik haa **ne1** **ho2**?
who eat shrimp WHQ HO
'Who eats shrimp, do you also wonder?'

(56) $[\![\text{ho}]\!](\textbf{quest}\ ([\![\text{who eats shrimp}]\!])) =$

$$\lambda c.\bigcup \begin{cases} \{c' \in \textbf{quest}([\![\text{W-E-S}]\!])(\mathsf{a}_c)(c'') \mid c'' \in (\textbf{quest}([\![\text{W-E-S}]\!])(\mathsf{s}_c))(c)\} \\ \\ \{c' \in \mathsf{FailSet}(\textbf{quest}([\![\text{W-E-S}]\!])(\mathsf{a}_c)) \mid c' \in (\textbf{quest}([\![\text{W-E-S}]\!])(\mathsf{s}_c))(c)\} \end{cases}$$

In simple words, (56) represents a question asking the addressee whether or not who eats shrimp is a performable question act for them. Concretely, given the definition of a question speech act in (48), the context change potential in (56) maps an input context to two types of output contexts, those in which the question act is performed by the addressee ($c' \in \textbf{quest}([\![\text{W-E-S}]\!])(\mathsf{a}_c)(c'')$), and

[17] Following Krifka's (2013) suggestion about English response particles like *right* or *okay*, we assume that the affirmative morpheme *hai* in Cantonese can refer to speech acts.

those in which the performance is not supported ($c' \in \mathsf{FailSet}(\textbf{quest}([\![\text{W-E-S}]\!])(\mathsf{a}_c))$).

What does it mean to perform an question act by the addressee? It means that someone in the context, either the speaker or the addressee, is expected to make an assertion to answer the question. Besides, the definedness conditions associated with the question operator also hold, namely, that the addressee has not publicly committed to any answer that can resolves the question, and that whoever intended to resolve the question does not have discourse commitments in c' that would contradict the answer used to resolve the question.[18]

Conversely, an output context c' belongs in the FailSet of a question act by the addressee if it does not support the performance of the question. Given the definedness condition associated with the question operator, this means either the addressee has added some $p \in Q$ to their discourse commitment set in c', or that the person who the addressee directs the question to has discourse commitments in c' that would contradict p.

A polar question constructed based on a partial question act resembles a polar question constructed from a partial assertive act in also admitting both an affirmative answer and a negative answer, as pointed out in section 2.3.2. An affirmative (or negative) answer to the polar *ne1-ho*-question amounts to performing (or not performing) the question act involving *ne1*. Since performing a question act typically carries a weak implicature of ignorance, the affirmative answer to the *ne1-ho2* polar question in (55) is incompatible with an answer to the lower *ne1* question, as demonstrated below:

(57) Hai lə1. (#Mingzai aa3.)
right UP Mingzai ASRT
'Right. Mingzai (eats shrimp).'

The polar question *ho2* creates based on a *ne1*-question is essentially a question seeking to confirm whether the *ne1*-question is shared by the addressee. For this reason, it is compatible with previous studies' understanding of *ho2* as a confirmational particle (Lam 2014). It also explains why *ne1-ho2* questions differ from *ne1*-questions in terms of context of use, as discussed in Section 2.3.2. A *ne1-ho2* question is appropriate when the speaker does not expect the addressee to know the answer to the *ne1* question, contrary to a *ne1* question, which has no such expectation.

A cluster involving *ho2* and the biased polar question particle *me1* can be analyzed along the same lines as a *ne1-ho2* cluster. Recall that *me1* takes a proposition and turns it into an unanchored polar question act with a bias against the proposition. When a *me1*-question is embedded under *ho2*, the entire form becomes a polar question seeking to confirm whether the addressee may perform the biased polar question or not. Consider a *me-ho2* interrogative repeated in (58) from section 2.3.1 and the interpretation given in (59).

(58) Ziming sik haa **me1 ho2**?
who eat shrimp BPQ HO
'Ziming eats shrimp? Do you also wonder?'

(59) $[\![\text{ho}]\!](\textbf{ob-quest}\ ([\![\text{Ziming eats shrimp}]\!])) =$

$$\lambda c.\bigcup \left\{ \begin{array}{l} \{c' \in \textbf{ob-quest}([\![\text{Z-E-S}]\!])(\mathsf{a}_c)(c'') \mid c'' \in (\textbf{ob-quest}([\![\text{Z-E-S}]\!])(\mathsf{s}_c))(c)\} \\ \\ \{c' \in \mathsf{FailSet}(\textbf{ob-quest}([\![\text{Z-E-S}]\!])(\mathsf{a}_c)) \mid c' \in (\textbf{ob-quest}([\![\text{Z-E-S}]\!])(\mathsf{s}_c))(c)\} \end{array} \right.$$

[18] The latter condition is inherited from **assert** encoded in **quest** (see (48)).

If the addressee chooses to perform a biased polar question, then the context is updated accordingly, as in the first set of output contexts. Each output encodes the discourse effect of performing a biased question. Alternatively, the speaker may choose to identify an input context as undefined for the biased polar question act, due to, for example, the addressee not sharing the bias. In this case, the input context, which corresponds to the output context of performing the biased polar question by the speaker, becomes the output context.

For this reason, if the addressee responds with an affirmative answer, it indicates that the addressee shares the speaker's bias (towards the opposite polarity of the prejacent proposition). If a negative answer is chosen, it indicates that the addressee does not share the speaker's bias. Both answer strategies have been discussed in section 2.3.1.

4 Applications and extensions

We have proposed that the Cantonese final utterance particle *ho2* operates on unanchored speech acts to generate a polar question seeking to confirm whether or not the speech act may be anchored to the addressee. We have also argued that unanchored speech acts are widespread and they are all compatible with *ho2* in principle. However, in reality there are final particles that may not form a cluster with *ho2*, as well as contexts in which a *ho2* cluster is unacceptable. In this section, we show that these cases, too, follow from the proposed anchoring semantics of *ho2*.

4.1 Questions that the addressee knows the answer to

Although a *ne1-ho2* cluster is a well-formed cluster in Cantonese with a well-defined interpretation, there are certain contexts in which such a question is unacceptable. According to the proposed analysis, a question-*ho2* structure asks whether or not the lower question act can be anchored to the addressee. As already pointed out earlier, this typically happens when the speaker has reasons to suspect that the addressee cannot answer the question. Consequently, if a speaker knows for sure that the addressee is able to answer a question, they would not choose to embed the corresponding question under *ho2*. For this reason, it is predicted that *ho2* is not compatible with a question that the addressee clearly may answer. This prediction is indeed borne out by the following example:

(60) **Getting to know someone's name**
Context: Annie is a receptionist at a dentist office. Bill walked in and said they had an appointment. Annie asked:

a. Nei giu me meng **ne1**?
you call what name WHQ
'What is your name?'

b. #Nei giu me meng **ne1 ho2**?
you call what name WHQ HO
'What is your name? Do you also wonder?'

This question is judged odd as the addressee knows his own name in normal circumstances. For this reason, the question embedded by *ho2* is not one that would typically be shared by the addressee.[19]

[19] In exceptional circumstances such as one in which the addressee suffers from amnesia, this question would be deemed acceptable.

4.2 Addressee-directed questions

In Cantonese, questions may end with final utterance particles other than *ne1* or *me1*, as briefly mentioned in section 2.1. For example, to indicate a polar question, the particle *maa3* may be used, as shown in (61). The particle *aa3* can also be used in *wh*-questions, as shown in (62).[20]

(61) Aaman sik haa **maa3**?
Aaman eat shrimp POLQ
'Does Aaman eat shrimp?'

(62) Lei-go hai mei jisi **aa3**?
this-Cl is what mean WHQ
'What does this mean?'

Normally, *ho2* may not be added to questions marked by *maa3* and *aa3*, as demonstrated in (63) and (64).

(63) #Aaman sik haa **maa3 ho2**?
Aaman eat shrimp POLQ HO
'Does Aaman eat shrimp? Do you wonder?'

(64) #Lei-go hai mei jisi **aa3 ho2**?
this-Cl is what mean WHQ HO
'What does this mean? Do you wonder?'

However, the infelicitous use of the questions can be remedied by *changing the addressee*, an example of which is given in (65).

(65) **Addressee change**
Annie, Ben, and Cindy were discussing their math assignment. Annie was stumped by a formula, and she thought that Cindy probably knows what the formula means, because Cindy got an A in the last math quiz. In addition, Annie thought that Ben might also ask Cindy the same question. In this situation, Annie could ask (↱ indicates a head turn from Cindy to Ben, indicating a change of addressee):

(66) Lei-go hai me jisi **aa3** ↱ **ho2**?
this-CL be what mean UP HO
'(To Cindy) What does this mean? (To Ben) Do you also wonder?'

This question is acceptable as long as the speaker signals that the inner question and the outer question are not directed to the same person. (63) can be remedied in the same way.

(67) Aaman sik haa **maa3** ↱ **ho2**?
Aaman eat shrimp UP HO
'(To Cindy) Does Aaman eat shrimp? (To Ben) Do you also wonder?'

In both examples, the speaker expects that the addressee of the inner question is capable of answering the inner question. The outer question cannot be directed to the same addressee, precisely because that addressee is already expected to answer the inner question.

We attribute this expectation to *maa3* and *aa3*. Interestingly, it can be shown that while *ne1*-questions may be used with or without an addressee present, their *maa3* and *aa3* counterparts may

[20] Like *ne1*, *aa3* may also be used in A-not-A questions and alternative questions.

Context	*ne1*	*aa3*	*maa3*
Addressee-present: Annie wanted to give her neighbor Betty a pack of chocolate but she didn't know if Betty ate chocolate. She saw Betty's brother and asked him...	OK	OK	OK
Addressee-absent: Annie wanted to give her neighbor Betty a pack of chocolate but she didn't know if Betty ate chocolate. So, she wondered to herself...	OK	#	#

Table 3: Addressee-present vs. addressee-absent questions

only be used when an addressee is present. For concreteness, the felicity of questions in (68-a) – (68-c) in addressee-present and addressee-absent contexts are summarized in Table 3.[21]

(68) a. Betty sik-m-sik zyugulik **ne1**?
Betty eat-not-eat chocolate WHQ
'Does Betty eat chocolate?'
b. Betty sik-m-sik zyugulik **aa3**?
Betty eat-not-eat chocolate WHQ
'Does Betty eat chocolate?'
c. Betty sik zyugulik **maa3**?
Betty eat chocolate POLQ
'Does Betty eat chocolate?'

We take the distinct contextual requirements to indicate that *maa3* and *aa3* have an additional felicity condition requiring the obligatory presence of an addressee who is expected to answer the question. It is this additional felicity condition that triggers an incompatibility with *ho2*.

Concretely, using *aa3* as an example, an slightly more complex question operator is defined in (69).[22] It has a non-source felicity requirement, just like the simpler one associated with *ne1*. However, on top of that, *aa3* also has an extra felicity condition requiring that the addressee in the input context c serves as a source of the answer p to the question. In other words, the speaker x has an expectation that the addressee in the input context c, rather than anyone else or the speaker (i.e., $x \neq \mathsf{a}_c$), has the ability to resolve the issue raised by the question.

(69) $\textbf{quest}_{\mathsf{a}} := \lambda Q \lambda x \lambda c.\{c' \mid \exists p \in Q : c' \in \textbf{assert}(p)(\mathsf{a}_c)(c)\}$
if $x \neq \mathsf{a}_c$ **and** $\forall p \in Q : p \notin \mathsf{DC}_x^c$, undefined **otherwise**

This question operator can be used for *wh*-questions, polar questions, alternative questions, or polar-alternative questions. Because of the explicit definedness condition that the question is not

[21] *Ne1*-questions can be used as self-directed questions, which as a speech act are felicitous when the answer is not known to the speaker (see Garrett 2001 for Tibetan, Murray 2010 for Cheyenne). Based on these cross-linguistic facts, Bhadra (2020) analyzes self-directed questions and rhetorical questions as being speech acts that do not raise issues, unlike true information-seeking questions. *Ne1* questions are thus compatible with being both information seeking as well as non-information seeking questions.

[22] The definition in (69) needs to be slightly modified for *maa3* so that it only yields a polar question.

addressed to the speaker, using a question with *aa3* is only appropriate if the context has an addressee and the speaker thinks the addressee is able to resolve the question. As a result, a question marked by *maa3* or *aa3* can never be self-directed.

Combining a question marked by *aa3* with *ho*2 without any signal of addressee shift results in an odd question. Consider (64), the denotation of which is represented as (70).

(70) $[\![\text{ho}]\!](\textbf{quest}_{\mathsf{a}}\ ([\![\text{what does this mean}]\!])) =$

$$\lambda c.\bigcup \left\{ \begin{array}{l} \{c' \in \textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(\mathsf{a}_c)(c'') \mid c'' \in (\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(\mathsf{s}_c))(c)\} \\ \\ \{c' \in \mathsf{FailSet}(\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(\mathsf{a}_c)) \mid c' \in (\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(\mathsf{s}_c))(c)\} \end{array} \right.$$

Informally, (70) captures such a question act: the speaker asks the addressee what is that noise, and then the addressee is asked whether or not they choose to ask himself or herself the same question. Due to the other-directed requirement of $\textbf{quest}_{\mathsf{a}}$, namely, that the questioner of *What is that noise* must not be the one to answer the question, the addressee himself or herself cannot perform the act '$\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])$'. Otherwise, we would run into a contradiction, shown as follows (the contradiction is highlighted).

(71) $\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(\mathsf{a}_c)(c'')$ is defined iff $\mathsf{a}_c \neq \mathsf{a}_c$ **and** $\forall p \in [\![\text{W-T-M}]\!] : p \in \mathsf{DC}_{\mathsf{a}_c}$

As a result, all output contexts must be in the FailSet of '$\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])$', so (70) leads to a non-inquisitive question, which we take to be responsible for degrading the sentence.[23]

The present analysis not only accounts for the deviance of (64), but also the felicity of (66), which has an addressee shift operation. Given this operation, the addressee of the inner question marked by *aa3* is distinct from the addressee of the outer question marked by *ho*. The change of addressee is signaled by the action of the speaker turning their head, i.e., ↱. Addressee shift is an under-explored phenomenon warranting more research. However, for concreteness we offer the following formulation ($g_1 := g(1)$):

(72) $[\![\text{↱}_1\ \text{ho}]\!]^g = \lambda A \lambda c.\bigcup \left\{ \begin{array}{l} \{c' \in A(g_1)(c'') \mid c'' \in A(\mathsf{s}_c)(c)\} \\ \\ \{c' \in \mathsf{FailSet}(A(g_1)) \mid c' \in A(\mathsf{s}_c)(c)\} \end{array} \right.$ Type: $(e\mathsf{T})\mathsf{T}$

The action ↱ bears an index that is linked to the person who the speaker turns to. Combining with ↱, *ho* leads to a question asking whether or not performing the speech act A is felicitous for the person yielded by g_1, instead of the addressee of A. Based on this formulation, the denotation of (66) is computed as follows.

(73) $[\![\text{↱}_1\ \text{ho}]\!]^g(\textbf{quest}_{\mathsf{a}}([\![\text{what does this mean}]\!])) =$

$$\lambda c.\bigcup \left\{ \begin{array}{l} \{c' \in \textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(g_1)(c'') \mid c'' \in (\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(\mathsf{s}_c))(c)\} \\ \\ \{c' \in \mathsf{FailSet}(\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(g_1)) \mid c' \in (\textbf{quest}_{\mathsf{a}}([\![\text{W-T-M}]\!])(\mathsf{s}_c))(c)\} \end{array} \right.$$

Given the addressee shift context in (66), (73) asks whether or not the new addressee Ben (assum-

[23] This solution is not without problems. For one thing, it is well known that rhetorical questions may admit only one answer. However, they are acceptable in many languages, including Cantonese.

ing $g_1 = \mathsf{b}$) would like to ask the earlier addressee Cindy (a_c) the *aa3*-interrogative *What does this mean-aa3*, a question act defined for the speaker. Since it is possible for the two people to perform the same type of question act involving the inner *aa3*-interrogative, this outer *ho2*-interrogative is inquisitive, and hence is acceptable.[24]

4.3 Imperatives

The incompatibility of *ho2* with *aa*-marked questions leads us to expect that *ho2* may also be incompatible with imperatives unless a switch addressee strategy is involved. Usually, a speaker who performs an imperative has expectations on the addressee, like *aa*-marked questions. Indeed, *ho2* is incompatible with imperatives regardless of whether they are an order, invitation, or suggestion, as shown in (74) – (76).[25] In addition, also like *aa*-marked questions, they can be improved if addressee switch is involved.

(74) Saan ceon **aa3** *(↱) **ho**?
close window IMP HO
(To Addressee A) 'Close the window!'
(To Addressee B/*A) 'Can you perform the request?' (Request + *(↱) + *ho*)

(75) Sik di Saang-gwo **laa1** *(↱) **ho**?
eat Cl fruit IMP HO
(To Addressee A) 'Have some fruits!'
(To Addressee B/*A) 'Can you perform the invitation?' (Invitation + *(↱) + *ho*)

(76) Tong lei dousi king do-di **laa1** *(↱) **ho**?
with you advisor talk more-Cl IMP HO
(To Addressee A) 'Talk to your advisor more often!'
(To Addressee B/*A) 'Can you perform the suggestion?' (Suggestion + *(↱) + *ho*)

Recall that *ne1*-questions are compatible with *ho2* because *ne1* does not explicitly identify the addressee of the question act. A similar pattern also shows up in imperatives—when an imperative does not make reference to the addressee but all conversational participants, then it is acceptable, as exemplified by the following examples.

(77) a. Cinkei m-ho lokjyu **aa3 ho2**?
please not-good rain IMP HO
'Please don't rain. Can you perform the wish?'
b. Jatding jiu zongzeong **aa3 ho2**?
necessarily need jackpot IMP HO
'Please let us win. Can you perform the wish?'

The semantics and pragmatics of imperatives have received much attention in the literature and it is beyond the scope of the present paper to defend any particular proposals. However, we still

[24] It is worth pointing out that the declarative *aa3* is nonetheless compatible with *ho2*. We have to stipulate that this is because the declarative *aa3* does not come with the definedness condition that the addressee be distinct from the speaker.

[25] Imperative clauses may admit a range of markers, include *aa3* and *laa1*. As noted earlier, *aa3* may appear in different types of clauses. We gloss it as IMP based on its environment.

think that it is possible to distill some insights from the literature on imperatives to shed light on why addressee-directed imperatives are incompatible with *ho2*.

What underlies the incompatibility is a principle very similar to the condition of *aa3*-marked questions that bans the self-questioning use. As discussed in Condoravdi and Lauer (2012) (see also Farkas 1988), imperatives always imply a minimization of speaker involvement. On typical directive uses, like (74)–(76), a speaker attempts to get the addressee to realize the content. In other words, after uttering an imperative, the speaker is to do nothing, but the addressee is to realize the content of an imperative. Based on this observation, Condoravdi and Lauer (2012) propose an informal conventional meaning component, as in (78), for imperatives:

(78) **Minimal involvement of the speaker** The speaker takes it to be possible and desirable that, after his utterance, there is no action on his part that is necessary for the realization of the content. (Condoravdi and Lauer 2012: 48)

Given this, consider what would happen when an addressee-directed imperative is embedded under *ho2*—the addressee is asked whether or not they may perform an imperative act directed to himself or herself, which violates the minimal involvement requirement. By contrast, once the addressee is switched, the addressee-directed imperative under *ho* is not directed to the current addressee himself or herself, but the earlier addressee. The condition in (78) is not violated.

4.4 Extension to related phenomena

If force shift to polar questions arises in the process of anchoring a speech act, we should expect a variety of force shift, corresponding to different anchoring functions. This section explores a few anchoring functions and what types of force shift they may correspond to in natural language.

To begin with, Beyssade and Marandin (2006), Lam (2014), and Heim et al. (2016) have identified a class of discourse particles called confirmationals, which includes Cantonese *ho2*, English *right*, Canadian English *eh*, Spanish *si* and *no*, and Medumba *a*. According to Heim et al. (2016), these particles serve the grammatical function of calling on the addressee to confirm a speech act. To the extent that confirmationals are indeed a natural class, speech act anchoring can be seen as a way to cash out the grammatical function of calling on the addressee.

If confirmational particles correspond to an anchoring function that anchors a speech act to both the speaker and the addressee (in different ways), it is imaginable that a simpler anchoring function may be formed anchoring a speech act just to the speaker or just to the addressee. We think both types of anchoring functions are found in natural language.

First, consider the anchoring function that anchors a speech act to the addressee but not the speaker. Such an anchoring function, as given in (79), yields an polar question about whether the addressee may perform a speech act or not without requiring that the speaker performs the act .[26]

(79) $f_{\mathsf{a}}(A) = \lambda c.\{c' \mid c' \in A(\mathsf{a}_c)(c)\} \cup \{c' \in \mathsf{FailSet}(A(\mathsf{a}_c)) \mid c' = c\}$ Type: $((e\mathsf{T})\mathsf{T})$

This anchoring function has the potential of modeling force shift involving so-called inquisitve rising declaratives in English, which are known to lack speaker commitment (Gunlogson 2001, Rudin 2018, Farkas and Roelofsen 2017). However, it is worth pointing out that many studies also

[26] Alternatively, the speaker parameter may still be present but it is just not used in anchoring the speech act associated with the lower force. It may still be involved in signaling that the higher polar question act is performed by the speaker.

attribute a weak commitment or bias component to rising declaratives in English, which (79) is not equipped to model without further assumptions.

Second, consider the anchoring function anchoring a speech act to the speaker but not the addressee, as shown in (80).

(80) $f_{\mathsf{s}}(A) = \lambda c.\{c' \mid c' \in A(\mathsf{s}_c)(c)\} \cup \{c' \in \mathsf{FailSet}(A(\mathsf{s}_c)) \mid c' = c\}$ Type: $((e\mathsf{T})\mathsf{T})$

Such a polar question can be used for checking whether the speaker may felicitously perform an act or not. At first glance, this may seem like an odd polar question to ask, as a speaker most likely knows whether or not they may perform a speech act. However, certain varieties of rising declaratives in English, namely, those used to raise a meta-linguistic issue, seem to have this flavor (see also Malamud and Stephenson 2015; Goodhue 2021). For example, a non-inquisitive rising declarative like *my name is Adam Smith?* can be interpreted as expressing the polar question: 'Can I assert that my name is Adam Smith or not in this context?'. Since a speaker can nearly always commit to their name, this generates an implicature about the appropriateness of using the assertion in the relevant context.

As far as we know, most previous studies, with the exception of Goodhue (2021), assume that inquisitive and assertive rising declaratives are entirely different beasts (Malamud and Stephenson 2015; Rudin 2018; Jeong 2018). This view leaves the common intonational pattern in these rising declaratives unexplained.[27] Our approach has the advantage of unifying these two types of rising declaratives in the same framework of speech act anchoring but still allowing them to differ slightly to derive their distinct discourse effects.

Lastly, although we have only investigated force shift to polar questions, the space of anchoring functions allow the presence of anchoring functions that do not change the force type involved. For example, Davis (2011) proposes an anchoring function, based on the Japanese particle *yo*, that anchors a speech act to all participants. We leave a more thorough exploration of anchoring functions in future research.

5 Conclusion

In this paper, we have investigated the phenomenon of force shift, where the simplex force associated with a clause type can be overridden to yield polar questions about the felicitous performance of the relevant speech act by the addressee. We offered a compositional approach to force shift involving particle clusters in Cantonese. The crucial observation is that a variety of types of forces can be transformed into a polar question with the help of the force-shifting particle *ho2* without suspending speaker attitudes. This observation is used to motivate treating force shift as a special case of speech act anchoring, which involves anchoring a speech act to both the speaker and the addressee, but in distinct ways. This study thus demonstrates that questions may be formed not only about propositional content, but also about force-bearing expressions.

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[27] That said, there is some initial evidence, from Jeong (2018), that inquisitve and non-inquisitive rising declaratives may have slightly different intonational patterns.

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