# The Contribution of Mood and Force in the Interpretation of Imperatives*

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## 1.     Introduction

The purpose of this paper is to present a way of interpreting imperatives, where the term IMPERATIVE refers to sentences that have distinctive imperative morphology on the main verb. Our main proposal is that the directive illocutionary force of imperatives is not the result of Gricean reasoning or inference, but is directly encoded in their logical form, and that Gricean reasoning plays a role in the variability of directive force. We define directive force as a function that takes a certain type of proposition and turns it into a DIRECTIVE ACTION, which we in turn define as an instruction to the hearer to update his or her PLAN SET. A plan set is a set of propositions that specify the hearer's intentions, and it represents the state of affairs that the hearer intends to bring about. We will show that these definitions yield interesting linguistic results.

This paper is organized as follows. In §2, we observe that across languages imperatives cannot be embedded and that in clauses embedded under directive verbs many languages use subjunctives or infinitivals. We discuss the implications of this for the proper characterization of the logical form of imperatives. In §3, we propose that the logical form of imperatives contains two components: one component encodes directive force, and the other encodes the irrealis modality contributing the information that the situation described by the imperative is unrealized. We also propose a way of interpreting the two components. In §4, we suggest an extension of our proposal for imperatives to interrogatives. In §5, we discuss how our proposal explains some of the interpretative aspects of imperatives, in particular the interaction of directive force and negation.

## 2.     No Embedded Imperatives

All matrix sentences are associated with a canonical illocutionary force. The canonical illocutionary force expressed by declaratives is assertive force, and the canonical illocutionary force expressed by interrogatives is question force. But when the same sentence is embedded, it loses its canonical force. For instance, a matrix declarative ceases to be an assertion when embedded, as attested in (1). Similarly, a matrix interrogative ceases to be a question when it is embedded, as attested in (2).[1]

(1)   a.     John is intelligent.
      b.     Mary thinks that John is intelligent.

(2)   a.     Is John intelligent?
      b.     I don't know whether John is intelligent.

A standard way of defining the semantics of declaratives and interrogatives is by identifying their semantics with that of the corresponding embedded clause. The main motivation for this approach is to allow a compositional semantics. Under this view, a declarative denotes a proposition which is a set of worlds in which that proposition is true, and an interrogative denotes a set of possible answers which can be thought of as a partition on the set of possible worlds (see Karttunen (1977), Groenendijk and Stokhof (1985)). Given this approach, the illocutionary forces expressed in matrix contexts are explained as the result of pragmatic inference or reasoning.

Although this approach has been quite successful in the domain of interrogatives and declaratives, extending it to imperatives is not straightforward. This is because imperatives differ from declaratives and interrogatives in that languages do not seem to allow imperatives to be embedded (as noted by Sadock and Zwicky (1985) and Palmer (1986)). Many languages use subjunctives or infinitivals in clauses embedded under directive verbs.

(3)   English
      a.    * I demand that give me the book.
      b.      I order you to give me the book.
      c.      I demand that you give me the book.

(4)   Modern Greek
      a.    * O   Yannis se   dietakse      grapse.
              the Yannis you ordered-2sg write-2sg.Imp
              'Yannis ordered you to write.'
      b.      O   Yannis se   dietakse        na grapsis.
              the Yannis you ordered-2nd.sg NA write-2sg.Subj
              'Yannis ordered you to write.'

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[1]Sentences can also be associated with non-canonical illocutionary force. For instance, a declarative *I am thirsty* can have the force of requesting for water, and an interrogative *Who cares?* can have the force of asserting that nobody cares. It seems that non-canonical force can be expressed by embedded clauses. For examples, *I regret to inform you that your services will no longer be required* has the force of firing someone, and this force is coming from the embedded *that*-clause. Surely, non-canonical illocutionary force is generated through Gricean inference. More discussion on non-canonical illocutionary force will be given in §3.3.

(5)  Spanish
    a.   * Pido que  habla-le.
           ask   that talk-2sg.Imp-her/him
           'I ask that you talk to her/him.'
    b.   Pido que  le       hables.
           ask   that her/him talk-2sg.Subj
           'I ask that you talk to her/him.'

(6)  Italian
    a.   * Ti  ordino che  fallo.
           you order  that do-2sg.Imp-it
           'I order you to do it.'
    b.   Ti  ordino che  lo faccia.
           you order  that it do-2sg.Subj
           'I order you to do it.'

(7)  French
    a.   * J'exige   que tu  finis.
           I-require that you finish-2sg.Imp
           'I require that you finish.'
    b.   J'exige   que tu  finisses.
           I-require that you finish-2sg.Subj
           'I require that you finish.'

(8)  German
    a.   * Hans empfiehlt, daß Du nicht zu aufdringlich sei.
           Hans suggests   that you not   too pushy      be-2sg.Imp
           'Hans suggests that you not be too pushy.'
    b.   Hans empfiehlt, daß Du nicht zu aufdringlich seist.
           Hans suggests   that you not   too pushy      be-2sg.Subj
           'Hans suggests that you not be too pushy.'

The fact that languages do not have embedded imperatives and that it is matrix clauses that express canonical illocutionary force leads us to believe that the imperatives have an operator that encodes illocutionary force. Moreover, we take the fact that languages use subjunctives or infinitivals in clauses embedded under directive verbs as an indication that the propositional type denoted by imperatives is the same as that denoted by subjunctives or infinitivals. In effect, composing a force-indicating operator with a proposition that has the same denotation as subjunctives or infinitivals derives an imperative interpretation.

## 3.    Logical Form of Imperatives

### 3.1.    Force in the Logical Form

Frege viewed truth as the key concept of the theory of meaning; but he was also aware that understanding the meaning of a sentence involves more than just

knowing its truth conditions (Frege (1960)). He took sentences to be complexes of two components: a component that expresses its thought (sense), and a component that expresses its force, where to know the sense of a sentence is to know under what conditions it is true, and to know the force of a sentence is to know the conventions of its use in discourse. According to Frege, there are linguistic expressions which serve as force-indicators of a sentence, playing the part of an assertion sign, a question sign, or a command sign. Thus, in addition to the signs for sentential operators such as negation and conjunction that contribute to the sense of the sentence, he proposed that signs for force-indicating expressions are also necessary.

Lewis (1976) expresses a similar opinion. According to Lewis (1976), a sentence should be divided into two components: the sentence radical and the mood. The sentence radical specifies a state of affairs, and the mood determines whether the speaker is declaring that the state of affairs holds, commanding that it hold, or asking whether it holds. Lewis's use of the term 'mood' corresponds to our use of 'force.' Lewis represents a sentence as in (9). S is the category for sentence radicals, and the Mood category can be instantiated by either declarative (dec), imperative (imp) or interrogative (int). Thus, force-indicating symbols are part of the syntax of a sentence.

(9)                                  Sentence
                                    /        \
                              Mood            S
                                |
                          {dec, imp, int}

According to Lewis, sentence radicals have truth-values as extensions, and functions from possible worlds to truth-values as intensions. The entire apparatus of model-theoretic semantics pertains to sentence radicals and constituents thereof. The semantics of force is something entirely different. It interacts with rules of language use in discourse.

We believe that the facts observed in §2 indeed show that the imperative directly encodes the information that it has directive force. We represent this information with a force-indicating operator in the logical form of imperatives, where the logical form is the output of syntax and the input to interpretation. Moreover, we propose that this force-indicating operator takes the propositional type of subjunctives or infinitivals, which we represent as $irrealis(p)$. The term $irrealis$ is intended to capture the fact that subjunctives and infinitivals in general denote unrealized hypothetical situations (see Stowell (1982), Portner (1992), Farkas (1991), Quer (1998)).[2] We represent the logical form of imperatives as in (10).

(10)    Logical form of imperatives:
        $directive(irrealis(p))$

In this logical form, $directive$ corresponds to the force-indicating operator, and $irrealis(p)$ corresponds to the sentence radical that expresses the sense and intension of Frege and Lewis. We can say that $irrealis(p)$ denotes a set of hypothetical possible worlds in which $p$ is satisfied. Further, the speaker is agnostic as to whether

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[2]In the literature, it has been pointed out that not all subjunctives and infinitivals are used in irrealis contexts, raising doubt as to the appropriateness of the term *irrealis* to classify the propositional type denoted by subjunctives and infinitivals. However, what is crucial for us is that the proposition associated with imperatives indeed express an unrealized situation. Hence, we believe that the term *irrealis* will suffice for the purposes of this paper.

the real world is included in this set of possible worlds. In other words, as far as the speaker is concerned, it is possible for the real world to be included in this set but s/he does not know whether it is. In general, the set of possible worlds denoted by $irrealis(p)$ is restricted to future-oriented possible worlds due to the meaning of $directive$. The interpretation of $directive$ will be discussed in §3.2.

Our proposal for the logical form of imperatives differs from the approach that imperatives merely denote a certain type of proposition. Bolinger (1977) argues that imperatives are a type of bare infinitival that denotes hypothetical situations. Huntley (1984) and Davies (1986) argue that imperatives denote propositions that specify potential situations. Wilson and Sperber (1988) argue that imperatives denote propositions that specify possible and desirable situations, where the situation is either desirable to the speaker or the hearer. According to all these studies, the directive illocutionary force expressed by imperatives is the result of pragmatic reasoning and inference based on discourse contexts. However, if imperatives simply denote a certain type of proposition, the fact that they cannot be embedded remains mysterious. Further, under the pragmatic approach, it is unclear why so many languages have special morphosyntactic forms for the expression of directives. Our approach provides a straightforward explanation for the fact that imperatives cannot be embedded: the logical form of imperatives includes an operator that expresses directive illocutionary force, and since embedded clauses do not express canonical illocutionary forces, imperatives cannot be embedded. Moreover, under our approach, imperatives are grammatically specified to express directive force, whereas reasoning and inference play a role in explaining the variability of directive forces that can be expressed by imperatives.

## 3.2.   Directive Force

Now we need to define what $directive$ means in the proposed logical form for imperatives in (10). In effect, $directive$ is responsible for expressing directive force, thereby making a sentence into a directive speech act such as commanding, ordering, or requesting. As first articulated in detail in Austin (1962) and systematically explored in Searle (1969, 1976), sentences are not used just to say things, but rather actively to do things. The action performed by uttering a sentence is called a SPEECH ACT. We will refer to directive speech act as DIRECTIVE ACTION.

We take the position that traditional truth-conditional semantics is not expressive enough to model the meaning of illocutionary force and the corresponding speech act. We believe that an appropriate way of defining directive action is to use the concept of INSTRUCTION. We propose that by performing a directive action, the speaker instructs the hearer to update a particular module which we call the PLAN SET. A hearer's plan set is a set of propositions that specifies his or her intentions to bring about a certain state of affairs. Thus, an imperative, $directive(irrealis(p))$, is an instruction to the hearer to add $p$ to his or her plan set. The notion of plan presupposes that the planner has the ability to carry out the plan. In imperatives, since the speaker is instructing the hearer to update the plan set, the hearer is, in effect, the planner. Hence, issuing this instruction implies that the speaker believes that the hearer has the ability to bring about $p$. If the hearer updates the plan set with $p$, then the hearer intends to bring about the situation described by $p$. Moreover, a plan is a future-oriented notion: if you are planning to bring about the situation described by $p$, then the situation is not realized at the time that $p$ is planned and it can be realized in the future. Thus, it makes sense for $directive$ to take $irrealis(p)$ as its argument because the future-orientation of $directive$ is compatible with the modality of unrealized contributed by $irrealis$. Further, if the speaker tells the hearer to plan to bring about the situation described by $p$, the implication is that the speaker wants the situation described by $p$ to be realized.

### 3.3. Variability in the Illocutionary Force of Imperatives

Given our definition of directive force and directive action, an imperative canonically expresses such directives as order, command, or request.

(11) Order, command
    a.    Stand at ease! (a commander in the army to his soldiers)
    b.    Take down this poem. (a teacher to her class)
    c.    Clean that mess up at once! (a mother to her child)

(12) Request
    a.    Please bring me some water.
    b.    Open the window, would you please?

But imperatives can also express illocutionary forces that do not seem to be straightforwardly directives, such as permissions, wishes, threats and dares. For instance, in a context in which someone knocks on your door and you reply by uttering *Come in*, you are not usually ordering or requesting the knocker to come in, but rather giving him or her the permission to do so.

Sentences in general can be used to perform INDIRECT SPEECH ACTS. For instance, although interrogatives canonically perform the speech act of requesting information, they can also perform the indirect speech act of requesting action. For instance, *Can you open the window?* has the literal force of a question requesting information as to whether the hearer has the ability to open the window, but it can also have an indirect force of a request to open the window. We argue that imperatives, just like other sentence types, can also be used to perform indirect speech acts, and we adopt the approach that sentences can be used this way by virtue of conversational implicatures arising from Gricean inference in certain discourse contexts (see Gordon and Lakoff (1971), Grice (1975), Searle (1975)). Since the description of the inference process is beyond the scope of this work, here we only make some brief and informal remarks.

In a context in which a person A has expressed the desire and intention to perform $p$, the implication is that A already has $p$ in her plan set. For instance, if A knocks on your door, then A is expressing her desire and intention to come in. That is, by knocking on your door, A is implying that her plan is to come in. By uttering *Come in!* in this context, you are acknowledging A's plan, rather than instructing A to update her plan set. It may be that if an imperative $directive(irrealis(p))$ is uttered in a context in which it is already known that the hearer has $p$ in the plan set, then it performs the speech act of permission as an indirect speech act.

An imperative such as *Have a nice day!* expresses a wish in general. A person does not usually have a control over having a nice day. She may have the desire and intention of having a nice day, but bringing about this state of affairs is not completely up to her. It will depend on events that are not always under her control. It may be that an imperative $directive(irrealis(p))$ can be used to perform the speech act of wishing as an indirect speech act if it is known that the hearer does not have control over realizing $p$.

Imperatives that have the force of threats or dares express the opposite of what they literally mean. For instance, the second imperative in the sequence *Go ahead. Hit me. Then you'll be sorry!* is actually expressing that the speaker is warning the hearer not to hit him or her. This is not specific to imperatives. Declaratives can also express the opposite of their literal meaning when they are used ironically or sarcastically. In (13), what B is actually saying is that Clinton is not smart.

(13)   a.    A: Clinton messed up again.

       b.    B: Yeah, he is really smart. (sarcastic)

Imperatives that express threats and dares are comparable to declaratives that express
irony and sarcasm. Just as we would not want to complicate the literal meaning of
declaratives to handle the latter, we would not want to complicate the literal meaning
of imperatives to handle the former. Instead, they should be handled by Gricean
reasoning and inference.

## 4.    Extension to Interrogatives

We have proposed that the imperatives have an operator which directly en-
codes directive force in their logical forms. If imperatives involve an operator that en-
codes illocutionary forces, other sentence types, most obviously interrogatives, should
contain a relevant operator as well, namely an operator that encodes question force.

At least in English, interrogatives in matrix contexts exhibit subject-verb in-
version, whereas indirect questions in embedded contexts do not. This may be an
indication of the presence or absence of a question force-indicating operator. There
are also other facts that indicate the presence of a force-indicating operator in matrix
interrogatives. A negative *yes-no* question in which both the negation and the verb
are in $C^0$ as a unit and a negative *yes-no* question in which the negation is lower
in the clause have different interpretational effects. The intuition is that the former
implies that the speaker is asking whether $p$ holds, and the latter implies that the
speaker is asking whether $\neg p$ holds. For instance, the question in (14a) asks whether
John is intelligent and the question in (14b) asks whether John is not intelligent.

(14)   a.    Isn't John intelligent?
       b.    Is John not intelligent?

This fact is puzzling given any semantics of *yes-no* questions, since both the ques-
tions in (14) have the same truth-conditional denotation. For instance, according to
Karttunen/Hamblin's semantics of questions, a question denotes a set of propositions
that constitute possible answers in a given world of evaluation. And this set is the
same for both of the questions in (14). According to Groenendijk and Stokhof (1982),
a question denotes a proposition that constitutes a true exhaustive answer in a given
world of evaluation. And this proposition is the same for both of the questions in
(14). Groenendijk and Stokhof (1985) show that the semantics of questions given in
Groenendijk and Stokhof (1982) is equivalent to a partition on the set of possible
worlds where each equivalence class represents a possible answer. And both ques-
tions in (14) return the same partition where one of the equivalence class represents
an affirmative answer and the other a negative answer.[3]

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[3]More formally, the denotation of questions in (14) translate into (1a) according to Kart-
tunen (1977), and (1b) according to Groenendijk and Stokhof (1982).

(1)   ⟦¬(*Johnisintelligent*)?⟧

      a.    $\lambda p\ [p(w) \wedge [p = \lambda w'$ (John is intelligent)$(w') \vee p = \lambda w' \neg$(John is intelligent)$(w')]]$
            (Karttunen semantics)

      b.    $\lambda w'\ [\neg$(John is intelligent)$(w) = \neg$(John is intelligent)$(w')]$
            (Groenendijk and Stokhof semantics)

If we posit the presence of an interrogative operator in $C^0$ that encodes question force, we may have a partial explanation as to the interpretational asymmetry between (14a) and (14b). We can say that even though the two questions have the same truth-conditional denotation, they have different implications due to the difference in the way negation and the interrogative operator interact depending on where the negation is located with respect to the interrogative operator. That is, when negation ends up in $C^0$, where the interrogative operator is, the negation interacts with the interrogative operator to generate the interpretational effects described above. On the other hand, when negation is lower in the clause in interrogatives, it does not interact with the interrogative operator in $C^0$, and so these interpretational effects are absent. However, further study is required to determine the exact nature of the interaction between negation and the interrogative operator and its effects on interpretation.

Without further argument, we assume that interrogatives have an interrogative operator that encodes question force in their logical forms, and we define question force in terms of the instruction concept. As in Groenendijk and Stokhof (1985), we assume that a question '$p$?' denotes a partition that represents the set of possible answers: namely the positive answer $p$ and the negative answer $\neg p$. Given this, simplifying matters a bit, we suggest that the question force is an instruction to the hearer to retrieve the proposition that represents the true answer (based on her beliefs about the state of affairs) from the partition and plan to notify the speaker of the proposition that has been retrieved. Thus, if $p$ is retrieved from the partition, then the hearer is instructed to update his or her plan set with a proposition *I tell the speaker p*.

## 5.     Explaining Some Interpretational Aspects of Imperatives

### 5.1.     Issuer of the Directive

The meaning of directive force in the logical form of imperatives encodes that it is the speaker who issues the directive. The prediction is that as a reply to an imperative, a question as to who issued the directive should never come up. But the felicity of the interaction in (15) seems to contradict this prediction.

(15)    a.      A: Leave!
        b.      B: Who says so?

On a closer look, what B is asking is not who issued the directive, but who is responsible for A's issuing the directive. B may also be asking whether the speaker has the authority to issue the directive. The question in (15b) has these interpretations exactly because the imperative operator encodes that the speaker issues the directive.[4]

### 5.2.     Target of the Directive

In imperatives, the speaker issues the directive to an addressee (or addressees). This is clearly so in cases where imperatives have overt 2nd person subjects, or empty subjects that are understood to be 2nd person. An apparent counterexample to this generalization is the fact that imperatives can have 3rd person subject NPs in English.

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[4] The original issuer of a directive expressed by an imperative may not be the speaker. For instance, in a military context, a lieutenant can issue an order in the form of an imperative which was originally issued by a colonel. Although the lieutenant, who is the speaker, is not the original issuer of the order, s/he is still issuing an order by way of transmitting the colonel's order.

(16)  a.    Nobody move.
      b.    Everybody get out as quick as he/you can.
      c.    Somebody pay the bill.
      d.    The boy in the corner stand up.

However, on a closer look, as pointed out by Stockwell et al. (1973), even in the imperatives in (16), the subject referent is in some sense being addressed by the speaker. Evidence that the subjects in imperatives are being addressed by the speaker comes from examples like the following. The examples in (17) show that the subject in the tag question must be in the 2nd person, even though the subject in the preceding imperative is in the 3rd person. The examples in (18) show that the 3rd person subjects of imperatives are anaphorically related to a 2nd person pronoun in the subsequent sentences.

(17)  a.    * The boy in the corner stand up, will he?
      b.    The boy in the corner stand up, will you?

(18)  a.    $Nobody_i$ move. I am begging $you_i$/*$him_i$/*$them_i$.
      b.    $Somebody_i$ pay the bill. I am begging $you_i$/*$him_i$/*$them_i$.

This property is captured by the proposal that the directive force encodes the information that the speaker issues the directive to the addressee.


## 5.3.    Future Orientation

Imperatives in general have future orientation. This can be shown by the fact that imperatives are compatible with future oriented adverbials, but not with past oriented adverbials.

(19)  a.    Finish your homework tomorrow.
      b.    * Finish your homework yesterday.

In addition, even adverbs that are not necessarily future-oriented can only be future-oriented in imperatives. For instance, *now* and *tonight* can occur in linguistic contexts that are not future-oriented, as shown in (20). In fact, *tonight* can even be past-oriented, as in (20b).

(20)  a.    John is eating now.
      b.    John finished his homework tonight.

But when *now* and *tonight* occur in imperatives, they can only be future-oriented. In particular, *now* in (22) means something similar to *from now on*.

(21)  a.    Behave yourself when the guests arrive tonight.
      b.    Finish your homework tonight.

(22)  a.    Behave yourself now.
      b.    Finish your homework now.

Moreover, as observed by Katz and Postal (1964), tag questions that follow imperatives are most natural with auxiliary *will*, providing support for future orientation of imperatives.

(23)  a.    Behave yourself, will you?

      b.    Behave yourself, won't you?

Bolinger (1977) argues that auxiliary *will* in tags following imperatives does not refer to futurity, but rather to willingness, and that the tag *will you* is paraphrasable as *are you willing to*. Even so, if you are willing to do $p$, you do $p$ in the future. Hence, the futurity of *will* remains.

The future orientation of imperatives is captured by our proposal that the logical form of imperatives encodes future-orientation. That is, in $directive(irrealis(p))$, the meaning of *directive* encodes future-orientation, thereby restricting the denotation of $(irrealis(p))$ to the set of future-oriented possible worlds.

Imperatives, however, can also refer to the present, as noted by Bolinger (1977).

(24)  a.    Please, be thinking about me.

      b.    (Holding a lottery ticket, a person utters the following imperative)
            Please be the right number.

Bolinger also claims that imperatives can refer to past events and provides the examples in (25) as supporting evidence.

(25)  a.    Don't have three-fourths of the whiskey drunk already.

      b.    Please, do have made that call by six o' clock.

However, these examples actually refer to the present state as indicated by the use of present perfect. Imperatives can refer to the present when they express the speaker's wish. The examples in (24) and (25) express the speaker's wish concerning the present, and they can be felicitously used only if the speaker does not know whether the situation described by the imperative has been realized or not. We have already pointed out that imperatives can be used to express a wish as an indirect speech act. In this case, the denotation of $(irrealis(p))$ is not restricted to the set of future-oriented possible worlds. It can denote a set of possible worlds that describe what the current state might be like.

## 5.4.  Negation and Directive Force

The directive force contributed by the imperative operator cannot be negated. In a negative imperative, negation does not have scope over the directive force. Rather, the directive force always has scope over the negation. We illustrate this point in (26).

(26)      Don't go.
          $\approx$ It is required that you not go.
          $\not\approx$ It is not required that you go.

In the logical form of imperatives that we have proposed, $directive(irrealis(p))$, $directive$ takes $(irrealis(p))$ as its argument. We have proposed that $directive$ is a function that instructs the hearer to update his or her plan set with the proposition $p$. In effect, it is a non-truth-conditional operator that returns a non-truth-conditional object. On the other hand, negation is a truth-conditional operator that operates on a proposition and returns a proposition. Thus, it is impossible for negation to operate on illocutionary forces.

According to Dummett (1973), Frege asserted that a sign for illocutionary force cannot meaningfully occur within the scope of sentential operators such as negation, but can attach only to a complete sentence as a whole. However, Dummett argues that illocutionary force signs can be negated and provides as evidence what he believes to be natural language expressions with negated illocutionary force. In particular, he claims that the case is very clear in imperatives. He believes that permissive *may* involves negating the force sign in imperatives. For him, if the force sign in a negative imperative is negated, the corresponding natural language expression is a permission sentence with the modal verb *may*, as represented in (27). The exclamation mark ! is a sign indicating directive force.

(27)      You may do X ≡ not!(you do not do X)

However, we do not believe that this is a valid proposal. The permission sentence *You may do X* is an indicative sentence with a modal verb *may*. Nothing compels us to represent this sentence with a negated directive force sign. We could very well represent it with an assertive force sign which takes scope over a permissive modal operator. In (28), $||$ is a sign indicating assertive force, and $P$ is the permissive modal operator.

(28)      You may do X ≡ $||P$(you do X)

In particular, the equivalence in (27) crucially depends on the equivalence between $\neg!\neg\phi$ and $P\neg\neg\phi$, where $P$ is a permissive modal operator, in analogy to the equivalence between $\neg\Box\neg\phi$ and $\Diamond\neg\neg\phi$ in modal logic.[5]

(29)   a.      $\neg!\neg\phi \equiv P\neg\neg\phi$
       b.      $\neg\Box\neg\phi \equiv \Diamond\neg\neg\phi$

If this is correct, then the equivalences in (30) should hold as well.

(30)   a.      $!\neg\phi \equiv \neg P\phi$
       b.      $\neg!\phi \equiv P\neg\phi$

That is, my directing $\neg\phi$ should be the same as my not permitting $\phi$, and my not directing $\phi$ should be the same as my permitting $\neg\phi$. But this is dubious. Consider the interaction in (31).

(31)   a.      A: I don't want to leave yet.
       b.      B: Ok. Then, don't leave.

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[5]For explanations of definitions used in modal logic, see Hughes and Cresswell (1996).

In this context, the imperative *Don't leave* uttered by B does not mean the same as *I am not permitting you to leave.* Rather, it means something similar to *I am permitting you to not leave.* Furthermore, the equivalence in (30b) cannot be valid either. For example, if I do not order you to leave, this does not mean that I am giving you permission to not leave.

Dummett's permission sentences involve two instances of negation: one that negates the directive force, and another one that negates the propositional content. We might then expect an imperative with double negation to generate a permissive reading. But this does not occur. The imperative in (32a) is a request to close the window and the imperative in (32b) is a request to finish the cake. The permissive readings *you may close the window* and *you may finish your cake* are not available for the imperatives in (32).

(32)   a.    Don't not close the window.
       b.    Don't not finish your cake.

Further, it is well known that an affirmative imperative can express a permission depending on the context. Although the imperatives in (33) do not involve any negation, they can perfectly well express permissions.

(33)   a.    Come in. (as a reply to a knock on the door)
       b.    A: Can I open the window?
             B: Sure. Open it.

We therefore do not believe that permission sentences are natural language expressions for negated directive force. Instead, we accept Frege's intuition that force-indicating signs cannot be in the scope of negation.
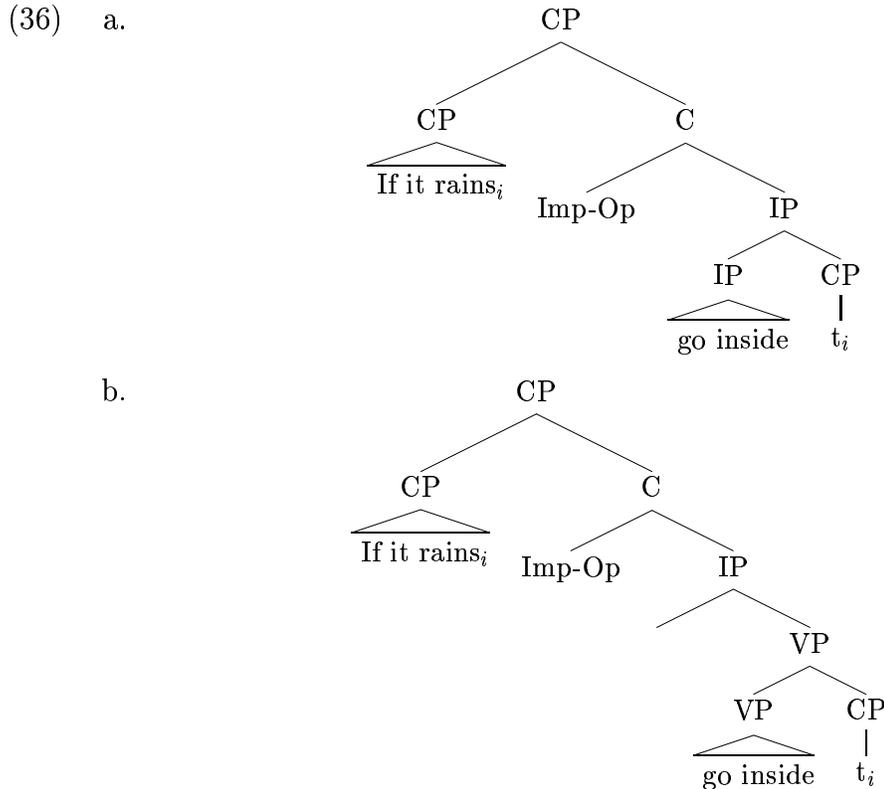
A question arises at this point as to the scope possibility of other truth-conditional operators and force-indicating operators. We conclude this subsection with a brief discussion on this issue, limiting it for simplicity to the directive-force indicating operator. We believe that the arguments carry over to other force-indicating operators. Let us first consider the scope possibilities of the conditional operator and the directive force-indicating operator in conditional imperatives, as in (34).

(34)   a.    Go inside if it rains.
       b.    If it rains, go inside.

For (34a), we can say that the entire sentence is a CP and the imperative operator which encodes directive force is in $C^0$, and the conditional clause *if it rains* is an adjunct clause that is right adjoined to IP or to VP, as illustrated in (35a) and (35b).

(35)   a.                                              b.
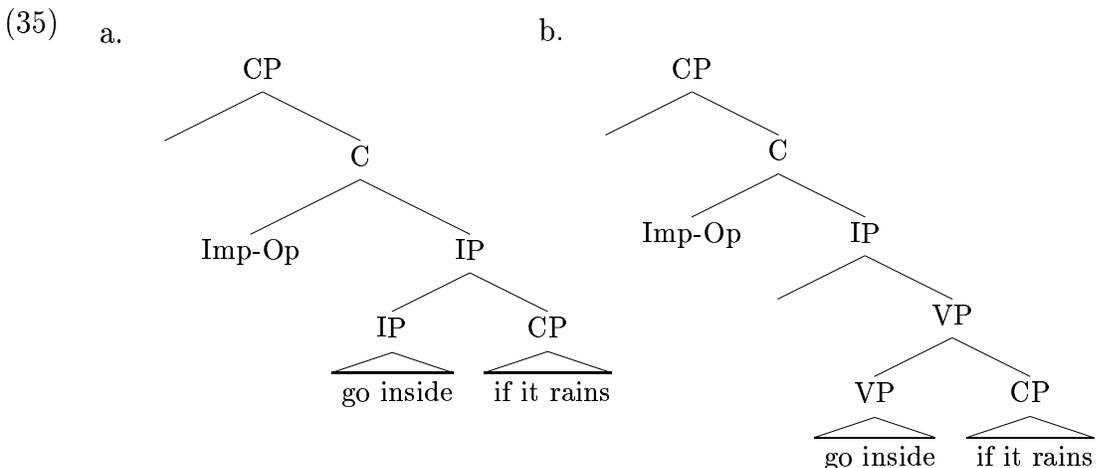
For (34b), we can say that its structure is just like that of (34a), except that the conditional clause has topicalized to the left periphery of the sentence. The conditional clause then reconstructs to its original position for interpretation. This is illustrated in (36).

(36)   a.

```
                        CP
                   ┌─────┴──────┐
                  CP             C
              ┌───┴───┐     ┌─────┴──────┐
             If it rainsᵢ  Imp-Op        IP
                                    ┌──────┴──────┐
                                   IP             CP
                              ┌────┴────┐          │
                             go inside   tᵢ
```

   b.

```
                        CP
                   ┌─────┴──────┐
                  CP             C
              ┌───┴───┐     ┌─────┴──────┐
             If it rainsᵢ  Imp-Op        IP
                                          └──────┐
                                                 VP
                                            ┌────┴────┐
                                           VP         CP
                                      ┌─────┴───┐      │
                                     go inside   tᵢ
```

Thus, imperative operator scopes over the entire sentence in both of the conditional imperatives in (34).

Other truth-conditional operators that require attention are *and* and *or*. In natural language, these operators can coordinate entire sentences (as in (37)) as well as subconstituents of a sentence (as in (38)).

(37)   a.    Eat an apple or eat an orange.
       b.    Have dinner and watch a movie.

(38)   a.    Eat an apple or an orange.
       b.    Buy beer and wine.

The sentences in (38) are examples of NP coordination. For these sentences, we can just say that the entire sentence is a CP with the imperative operator in $C^0$. And so the imperative operator has scope over the entire sentence. But we cannot say the same thing for the examples in (37). In (37), two imperatives are coordinated in each example. The verbs in each conjunct are in the imperative form. In effect, in (37), *and* and *or* have scope over two imperatives. Given this fact, we restrict the truth-conditional operators that cannot scope over illocutionary-force operators to negation and the conditional operator.

## 5.5.    Speaker's Belief in the Realization of the Situation Described by the Proposition

The speaker of an imperative believes that the state of affairs described by the proposition it expresses is realizable. Hence, it is infelicitous to follow an imperative with a sentence that expresses the speaker's belief that the situation described by the proposition of the imperative will not be realized.

(39)   # Eat this fish! But you won't.

Moreover, imperatives with individual-level stative predicates are infelicitous because the states of affairs described by individual-level statives are not something that can be realized unless they have already been realized.[6]

(40)    a.   # Be tall.
        b.   # Have blue eyes.

This property is captured by our proposal that the directive force entails the information that the speaker believes that the addressee has the ability to bring about the state of affairs described.

## 6.    Conclusion

In this paper, we have proposed a way of interpreting imperatives. We have argued that the logical form of imperatives includes two components: one that encodes directive illocutionary force and another that encodes the irrealis modality that contributes the information that the situation described by the imperative is unrealized. We defined the component that encodes directive force as a function that takes a proposition that denotes a set of hypothetical possible worlds and turns it into a directive action. We defined a directive action in turn as an instruction to the hearer to update a plan set with a proposition. According to our analysis, the directive force of imperatives is not the result of Gricean inference, but is directly encoded in their logical forms, and Gricean inference plays a role only in explaining the variability of directive force of imperatives.

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[6]The sentences in (40) can be felicitous if the speaker is a fairy godmother or if the speaker is expressing a wish.

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