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PREDICTIVE ILLOCUTIONS AND CONVERSATIONAL SCORES

PABLO FUENTES
pablo.fuentesopazo@manchester.ac.uk,
School of Arts, Languages and Cultures,
The University of Manchester, England

ABSTRACT. The article argues for an illocutionary distinction between predictions and what will be classed as prospections. It provides a critical examination of the notion of prediction and its standard definition in speech act theory. In light of some counterexamples, and after suggesting some amendments regarding evidence, I show that a dynamic model of assertion can account for different future-oriented illocutionary forces. One interesting result is that, by analogy with bets, the essential effect of predictions on context relies not on adding the propositional content to the conversational score, but only the record of the very linguistic act that is being performed by the predictor.

Keywords: prediction; prospection; assertion; evidence; conversational score

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1. Introduction

Although instances of predictive illocutions are not uncommonly referred to in empirical and formal studies of natural languages, systematic accounts of the very notion of prediction are rather scarce. Furthermore, there is a widely shared assumption in the literature that (nearly) all future assertions are predictive in nature. This is commonly supported by the epistemological claim that, given that the future is uncertain, any assertion that refers to a future event is predictive in its very essence. The assumption reaches far into compositional approaches to meaning as well, some of which tend to define the denotations of future morphemes by referring (informally, perhaps) to such a notion.[1]

In this paper, I would like to cast doubt on this assumption and propose an illocutionary distinction between predictions and what I will call "prospections." I do this in two stages: first, by showing that definitions in traditional accounts of predictive illocutions are in need of more restrictive amendments; and second, by

showing that a dynamic approach to meaning can, in effect, account for the different elements that, in given conversational frame, map the (primitive) future meaning of a sentence into either predictive or prospective illocutionary force.

My critical approach brings to the fore one substantial caveat for speech act theories: that not every assertive speech act that refers to a future event is predictive in nature. More constructively, my proposal suggests that sentences which encode future meaning are understood as having predictive illocutionary force only under certain assumptions regarding the type of justificatory evidence and what is actually added and recorded in the conversational score at utterance time.

The paper is organized as follows. In section 2, I offer a critical review of one standard definition of predictive speech act, and suggest some amendments reflecting on a few counterexamples. Taking on these results, section 3 draws a distinction between prospective and predictive illocutions, and provides a contrastive dynamic analysis of prediction and other future oriented speech acts.

2. Predictive Illocutions: The Standard Definition

Although the literature on the subject of speech acts is considerably vast and well documented, formulations of a definition of *predicting* are rather uncommon. One particular attempt is the following:

> To predict is to assert with the propositional content condition that the propositional content is future with respect to the time of the utterance and the additional preparatory condition that the speaker has evidence in support of the proposition (Searle & Vanderveken, 1985: 186).

I will refer to the above as the "Standard Definition" (for short: SD) and its background theory as the "Standard View" (for short: SV).[2] As it stands, SD reveals a basic tenet of SV: an illocutionary act is defined by a set of necessary and sufficient conditions for the performance of the act.[3] This preliminary setup provides a substantial starting point: predicting is not defined in terms of syntactic structure, prosodic patterns or social effects, but rather, by spelling out conditions that are primarily related to propositional content and the speaker's justificatory potential: (i) the propositional content condition that the content is *future* with respect to speech time, and (ii) the preparatory condition that the speaker possesses *evidence* in support of what is said. In the current section I will provide a critical examination of SD, reflecting on some counterexamples, and suggest some possible amendments. This preliminary approach will clear the ground for a more constructive approach in section 3 by putting in perspective the basic epistemic and semantic elements involved in predictive illocutions (and future oriented speech acts more generally).

An immediate problem with SD is that, as it stands, it is too *strong*, in the sense that it rules out illocutions that one would intuitively class as predictive. The problem is related to SD's first condition (namely, that the propositional content is

future with respect to speech time). For one can certainly find instances of predictive illocutions that are not, strictly speaking, about the future (and, accordingly, that are not conveyed by future tensed propositions). One example would be "I predict that Mary *won* the election," uttered at a time at which the election has already been held, but participants remain ignorant of the results.[4]

A defender of SV can object to this critical point on methodological grounds: in theorizing about speech acts, it is recommendable to generalize in view of "paradigmatic" or "prototypical" cases, to only then accommodate the more exceptional ones. I will not assess this methodological issue here, but rather concede the point. For even though this first caveat hints at a critical point I will reflect on below (namely, that the assertion/prediction distinction is not reducible to purely temporal terms), my argumentative strategy will focus on the more characteristic future-tensed type of construction, to then argue that a large subset of *them* are not used for predictive purposes. This will make a stronger case for the overall critical aim of the article. As I hope it will be made clear, that not every future sentence is necessarily mapped into a predictive illocution is not inconsistent (and actually resonates) with the acknowledged fact that past tensed constructions can also yield, in relevant scenarios, a predictive effect.

Now, a second problem with SD is that it is also too *weak*, in the sense that it is satisfied by entities and events (namely, linguistic constructions and their utterances) that do not pertain to the class of things that are being defined. And this permissiveness is, of course, one major problem for any definition in any field of study. By way of illustration consider the following two utterances:

[1] Elections will be held in Wales on June 6th next year (*as it is scheduled*).
[2] Mr. Jones will win the Wales elections on June 6th next year.

The basic point here is that both [1] and [2] satisfy SD, but only [2] is meant as a prediction whereas [1] is not. In effect, the case with [1] is such that even though its propositional content is future oriented (i.e., it satisfies SD's propositional content condition), and even though the speaker may hold evidence in support of it (i.e., it satisfies SD's preparatory condition), speakers would not naturally report the utterance of [1] as making a prediction. And one chief reason why one would not consider the utterance of [1] as a clear-cut case of prediction is, arguably, that predictors do not characteristically target the holding of scheduled or planned events (that elections will be held in Wales on such-and-such day in the future), but rather, quite specific and uncertain aspects of these and other events (that either Mr. Jones or Mr. Davies will win the election). This is arguably why news reports often cover who predicts which candidate will win (and retrospectively, who got it right and wrong). It would be awkward, to say the least, a news report on who predicts what day the election would take place when a date has already been set. Thus, if we take the same speaker to utter [1] and [2] in the scenario where the date of the election has already been set, participants would naturally tend to report only [2] as a prediction.[5]

At this point, one may wonder whether a notion such as *inertiality* can be of any analytical use. The notion is, in effect, not new to semantic analysis of future oriented illocutions (see Copley, 2009). Informally, it refers to that aspect of an event in virtue of which the event is to be held in the future (either by means of convention, agreement, commitment, habit, regularity, nomic necessity, *inter alia*). The rationale for invoking such a notion in this particular regard would be that [1] constitutes a counterexample of SD in virtue of the fact that the speaker targets (an aspect of) an event that is inertial, whereas it is usually expected of predictors that they target those (aspects of) events that are non-inertial in nature, as the speaker who utters [2] exemplarily does.[6] Accordingly, what *seems* to be needed for a more restrictive definition, is a qualification to the effect that the event referred to by issuing a prediction is not of the inertial kind, but of the non-inertial kind.

The idea resonates with Searle's own constraints on other future oriented speech acts, such as promises:

[3] *Preparatory Rule (promising)*: *PRO* is to be uttered only if it is not obvious to S and H that S will do A *in the normal course of events*[7] (slightly modified from Searle, 1969: 63, and 1996: 10–11, my italics).

Now, does [3] provides an indication of how a preparatory rule for prediction (*PRE*) shall be spelled out? Prima facie, what was needed to be brought into our definition was a qualification to the effect that the event referred to by issuing a prediction is not of the inertial kind, but of the non-inertial kind. However, notice that what is specified in Searle's rule as a condition of the illocutionary act is not exclusively related to the nature of the event, but to the knowledge and evidence that participants have of its coming into existence. For there is a subtle point in [3]: the condition spelled out is not imposed on the nature of the action/event itself, but on how that action/event is perceived by the participants. And this is a telling difference: what is at issue is not that the event shall not be, *as a matter of objective fact*, inertial, but rather, that *it shall not be obvious*, for both participants, that it is. This actually brings a significant effect when one considers its potential application to the case of predictions. For, a putative predictive analogue of [3] would leave one possibility open: that (objectively) inertial events, which are not known by participants to be so, satisfy the condition and consequently qualify as predictable.

And, in effect, such cases are not infrequent. A simple example to illustrate: a prediction about an event that has been scheduled to occur (say, a football game), but whose arrangement remains utterly unknown to participants. Under those circumstances, the speaker (perhaps on his way to the pub with the addressee) might speculate and make all sorts of conjectures about when the event shall occur, to eventually utter:

[4] The game will begin at 18:00.

In sharp contrast to [1] (and despite the fact that the event at issue is, by hypothesis, inertial), [4] does intuitively qualify as a prediction. And the main reason for that being the case is preparatory in nature: simply put, it is not obvious for the participants that the event will hold at the time that speaker predicts it will.

Let me illustrate this same point with a contrast. Consider two speakers, in diverting circumstances, issuing the same utterance and referring to the same event. The first speaker (let us call him "The Man in the Station") is sitting beside you in the train station and, while reading the timetable of departures on a screen, he utters:

[5] The train to Liverpool will depart at 11:00.

A second speaker (let us call him, "The Man in the Street") is on his way to the station, with no timetable at hand, nor any device to find out at what time the same train to Liverpool departs. Walking beside you, he mutters what seems to be a speculative ponderation regarding time patterns of arrivals and departures, perhaps remembers a few (rather inconclusive) facts, to eventually utter [5].

Now, it seems natural to report that while "The Man in the Station" is not issuing any prediction (but, perhaps, only conveying information), "The Man in the Street" does. And it is also apparent that the reason why this is the case does not relate to the inertiality of the event: by hypothesis, one and the same event has been scheduled, by competent authorities, to occur at 11:00. Rather, a telling difference between the two cases concerns the epistemicity of the same referred event: only to the man in the station (but not to the man in the street) is it obvious that the event will occur, as a matter of inertial course, at 11:00.

The above suggests that what is (and what is not) a qualifying subject matter of a predictive illocution is not determined by the *ultimate* objective nature of the referred event, but by the participants' (fallible) recognition of the relevant particular aspect of the event at speech time.[8] By the same token, what precludes SD from becoming a satisfactory definition of predictions is not the omission of a certain kind of future events (i.e., non-inertial future events), but of a certain kind (or amount) of (fallible) knowledge.

All of which leads us to the issue of *evidence*. And one thing that is worth noticing in this respect is that we seem to be facing a tension. And the tension is the following. A very essential claim in SD is that the predictor must have evidence in support of what he asserts. However, and considering our working (counter)examples, if one were to identify an asserter possessing robust evidence in support of what is said, that would be the man in the station, not the man in the street. Arguably, seeing the information on the screen is more reliable evidence than the conjectural, albeit successful, inferential process made by the man in the street. However, as it turned out, it is the man in the street who is issuing a prediction, not the man in the station. Evidence, thus, does not seem a discerning element after all. So either we delete from SD any constraint related to it, or we standardize the evidence possessed by the speaker so as to effectively rule out (cases like) the man in the station.

The first strategy does not seem very promising: dispensing with evidence as a necessary condition would leave room for blind guesses to qualify as predictive, and we certainly do not aim for such permissible definition of prediction. In our example, it is true that the man in the street does not possess compelling evidence (as the man in the station perhaps does), but he certainly has *some* evidence which allows him to do his ponderation. Otherwise, we would not consider him issuing a prediction.

The second strategy can attain a better effect in this same respect, although it may be a contentious issue how to standardize evidence. To clear the ground, I think a basic distinction is appropriate here, namely, that between constraints concerning the *amount* of evidence and those concerning the *type* of evidence. For it might be the case that, despite the fact that the man in the street is never in the position to provide conclusive evidence for what is said, evidence is nevertheless required, if only *to a certain degree* or *of a certain kind*, for us to ascribe him a predictive illocution.

Let us consider, first, quantity. The rationale of our putative constraint can be stated in the following lines: the predictor must have *some* supporting evidence for what he asserts (so as not to turn his future assertion into a blind guess), but *not as much* as to turn his utterance into a simple informative statement. In other words, the predictor must be in possession of some amount of evidence, yet only to the extent that he remains uncertain to a modest but relevant degree. That is why he *predicts* rather than *assures*, that is why he *predicts* rather than *announces*, that is why he *predicts* rather than reiterates what has been already taken for granted. Let me call this the *Modest Evidence Condition*. It seems obvious that, as a constraint, it could be easily added on SD. This would render SD*:

[SD*]
To predict is to assert with the propositional content condition that the propositional content is future with respect to the time of the utterance and the additional preparatory condition that the speaker has *modest* evidence in support of the proposition.

But, is this right? Modest evidence as a constraint for predictive illocutions? There is one serious problem with SD*: the definition rules out one particular and reputable subclass of predictive illocutions, namely, *justified predictions*. For, certainly, there is nothing contradictory in the idea of a prediction (scientific or ordinarily tailored), that is issued by some intelligent being in possession of an amount of evidence that turns his assertion into something very close to conclusive. In effect, robustness (rather than modesty) is the standard required for scientific predictive procedures. True: ordinary predictions, the one made by the man on the street, can *tolerate* modesty (as my examples above have shown), but modesty could not possibly be a general defining feature of predictive illocutions.

Let us, then, shift the focus from quantity to quality: that is to say, from the amount of evidence to the *kind* of evidence required. By this token, what determines

what is predictable and what is not shall not rely on the degree of conclusiveness reached by the predictor, but on the type of evidence he possesses. And one reasonable qualification in this respect is the following: if one were to identify an aspect that is common ground for both scientific and ordinary predictions, it would be reasonable to point to some sort of *personalized* inferential process that justifies what is said. By stressing "personalized" I just intend to denote the idea of "taking part of," as opposed to merely acting as an "information-conveyor" that does not (at least not necessarily) participate in the inferential process that leads to the conclusive illocution. By these standards, cases such as the man in the station are easily ruled out, on the basis that the information about the future was merely conveyed by a *deferential* process (i.e., a process by which a speaker *reasserts* a reputable justified statement). In a more schematic way, a deferential process can be described as follows: when an asserter A utters *p* and *p* is justified as a conclusion, an asserter B can make use of his right to reassert *p* (or use *p* as a premise for further assertions) in virtue of A's reputation as an asserter.[9] To illustrate with another simple example: if you tell me that Cristina will go to Paris for the summer holidays (and openly let me know that she told you about her *having already chosen* that destination), it would be awkward, to say the least, that I describe you as making a prediction about her holidays.[10] But if none of us knew what her holiday plans were, and you start making some conjectures and speculations regarding her likes, past summer histories, perhaps flight offers and such, to finally conclude that she will choose Paris as her summer destination, it would come more than natural to ascribe you a predictive illocution. Needless to say, unless you are challenged (or, to the same effect, gently asked to justify your claim) you are not under the obligation to speak aloud the inferential chain that led you to your prediction. And in the case I am dubious whether you meant your statement as a prediction or simply as conveying information from an authorized source (namely, from Cristina herself), I can simply ask you to make explicit your evidence ("how do you know?" would suffice). Alternatively, I can rely on other evidence, such as asking Cristina if she told you. Notice, however, that this is not evidence *about the facts* (I am not asking Cristina if she will choose Paris as her summer destination), but *evidence about evidence* (I am asking her if she told you so, so I can get clear on how you meant your statement).

To summarize a bit, the distinction regarding evidence that I am introducing at this point is twofold. On the one hand, I distinguish between (i) *first-order* evidence a speaker may hold to justify his assertion (i.e., evidence about the *facts* referred to by the proposition), and (ii) *second-order* evidence a participant may hold about the kind of evidence that a speaker entertains in issuing his assertion (evidence about evidence).[11] On the other hand, I would like to draw a further distinction between (iii) inferential evidence (evidence that relates to some rational process) and (iv) deferential evidence (evidence that stems from a reputable original source) to justify a claim. Thus, with these distinctions in mind, the discussion above suggests that the *first-order evidence* that a predictor holds in issuing a prediction

must be *inferential* in nature. Back to our original examples: the man in the station has reliable deferential first-order evidence to justify his utterance (evidence from an external authorized source and about the facts). The addressee, however, who is sitting beside him and *sees* him reading the timetable screen as he utters [5], handles a second-order type of evidence: evidence that the speaker's evidence is deferential. And *because* the addressee holds this type of evidence, she would not ascribe to the speaker's (honest, informative, justified) utterance a *predictive* force.

The intuitive picture suggested above is that of a predictor who, regardless the certitude reached by the evidence he possesses, entertains some sort of inferential procedure. Our paradigmatic counterexample, a man in the station looking at a timetable and simply reporting train departures to us on a deferential basis, brought some evidential elements to the fore. At this point, I would like to put some of these elements into a slightly different perspective, and reach a more conclusive diagnosis.

It is worth noticing that, although the deferential chain in our working example leads to an informational source stocked in the form of a timetable, the timetable itself is not what we characteristically conceive as an ordinary speaker. And here the thought goes that perhaps a better way to conceive timetables is by ascribing to them some sort of commissive aspect, as it seems that the core element conveyed by this informational source does not come in the form of an assertion about the future, but as an implicit *commitment* to the relevant course of action that leads to the arrivals/departures at the stipulated time. If this line of thought is on the right track, stretches of discourse such as timetables and fixtures are not entirely assertive in nature, insofar as they *commit* a background asserter (perhaps institutionally) to bring about the relevant events at the relevant times.

It is also worth noticing the role that the man in the station plays in this hypothetical conversational scheme. On the one hand, as a mere informant of the timetable contents, he is not engaging in any commitment (but implicitly reporting on one). On the other hand, as long as he only "re-assert[s] the original claim" (Brandom, 1983: 642), he is not issuing any prediction (let alone, if the original illocution was not meant as such).

The case raises some interest because it relates more generally to instances of speech acts in which a commitment or an obligation is in play. Consider the following sentence:

[6] John will have to sing boleros (tonight).

Now here are two scenarios where this sentence can be felicitously uttered. In the first scenario (henceforth, the *predictive* scenario), John's manager is deciding whether he needs a bolero repertoire for tonight's audience, and while he reaches a decision, participants in conversation speculate (and *predict*) about John's future obligations. In the second scenario (henceforth, the *non-predictive* scenario), John has already received the order from his manager to sing boleros, and informs the

speaker so (who in turn takes John's words to be sincere and utters [6] to the addressee).

Now, it seems clear to me that the enforcing circumstances that trigger John's obligation (namely, the manager's order) are placed in two different temporal locations in each of these scenarios: while the relevant order is placed to the future of speech time in the predictive scenario, in the non-predictive case the order has, by hypothesis, already been issued. And this difference in the temporal placement of the relevant triggering fact of the denoted commissive/obligational state, has a significant effect on the very nature of both speech acts: while the speaker in the non-predictive scenario is reporting *current* enforcing circumstances that prospect a future event (John's singing boleros), those enforcing circumstances are *not* actualized yet, but only forecasted by the speaker of the predictive scenario. Hence, only in the latter case one would say that the speaker is, *stricto sensu*, predicting a future obligation. For the speaker in the non-predictive scenario is (perhaps implicitly) ascribing a *current* obligational state to John.

A crucial piece of evidence for supporting the diagnosis above is that only in the non-predictive scenario, but not in the predictive one, the present simple construction is pragmatically acceptable:

[7] *Predictive scenario*: John's manager is deciding tonight's repertoire but has not issued an order yet. Participants speculate and make their predictions.
a. 'John will have to sing boleros (tonight).' OK
b. ?? 'John has to sing boleros (tonight).'

[8] *Non-predictive scenario*: John's manager has reached a decision and ordered him to sing boleros tonight. Speaker informs the addressee about this.
a. 'John will have to sing boleros (tonight).' OK
b. 'John has to sing boleros (tonight).' OK

I will refer to the acceptability of [8b] in non-predictive scenarios as the "present simple alternation." Arguably, what such an alternation is pragmatically attaining is an implicit obligational ascription to John's current circumstances. And this ascription is clearly incompatible with a predictive reading of [6]. Hence, what the non-predictive scenario makes evident is that *not all future talk* is predictive. Or, simply put, that referring to future events does not necessarily entail predicting.[12]

How does the above connect with our central example, the predictive and non-predictive utterances of [5] (to recall: 'The train to Liverpool will depart at 11:00')? Let me first point out that there is a crucial difference between the man-in-the street and the-man-in-the-station. For the former, it is not clear what the relevant commitments are, and by issuing a prediction about the train's departure the speaker is also making a prediction about that particular piece of (circumstantially inaccessible) information. In contrast, by uttering [5] (as he reads the information displayed on the screen), the man-in-the-station is ascribing the relevant commitments to the background institution (and insofar as he does *that*, he is not predicting what the commitment is).

Of course, these are just sample cases of what speakers can do. One can also build an example of a man-in-the-station who, skeptic about the claim in the timetable that the train to Liverpool will depart at 11, makes a prediction according to which the expectation will not be fulfilled:

[5'] It will depart at 11:15, you know how they are.

In a similar vein, one can also conceive the man-in-the-street reasoning in two inferential stages: first pondering what the commitment is, then considering a possible delay, to eventually utter [5']. But this does not affect our main idea, which points to an accountable difference in what is assumed and not assumed, pondered and not pondered, in the informational backgrounds of these distinctive speech acts. Crucially, insofar as the man-in-the-station does not call into question the commitment stipulated in the timetable's contents, he is not issuing a prediction, but only *ascribing the commitments* to an asserter (and perhaps adding them to our inertial expectations). Whereas for the man in the street those commitments are the very (terminal or partial) *target* of his prediction.

With these considerations in mind, I would like to suggest that, given that future tensed sentences are compatible with both predictive and non-predictive interpretations, the distinction to be drawn in the domain is not related to different temporal semantics, but to two distinct illocutionary forces. And the pragmatic ascriptional element referred above can be made one crucial distinctive factor between these two distinctive future-oriented illocutionary acts. For insofar as we are able to determine what is accepted (and what is not) in the informational backgrounds of the participants, an account of different speech acts is worth pursuing. To that effect, in the following section I give content to a dynamic analysis that points in that direction.

3. Assertions, Prospections and Predictions (and Bets)

In the effort of testing SD against a realistic set of counterexamples, we entertain the view that an utterance such as [5], repeated below in two distinctive scenarios ([9a] and [9b]), may not express a prediction, even though it satisfies the requirements of the definition.

[9] Utterance: The train to Liverpool will depart at 11:00.
a. *Predictive scenario*: the man-in-the-street.
b. *Non-predictive scenario*: the man-in-the station (reading the timetable).

This fact motivated not only the consideration of possible amendments for SD, so as to effectively rule out cases such as [9b], but also the methodological suggestion that an approach in terms of what is accepted into the informational background of the participants may well capture the illocutionary difference between [9a] and [9b].

Before we proceed with such an approach, a preliminary clarification about the taxonomy of these different types of illocutions is in order. More specifically, our query at this stage can be formulated in very simple terms: if not a prediction, what kind of speech act does [9b] represent? Until now, I have referred to it, somewhat informally, as a simple informative future statement. However, this simple nominal operation, as naïve as it may seem, conflicts with both SD and SV, given certain tacit assumptions of the latter. One of such assumptions is that most, if not every, justified future assertion is a prediction. In effect, although it is true that SD is not formulated in a bi-conditional form, there seems to be too narrow conceptual space in the descriptive taxonomy of SV for a justified future assertion that is not meant as a prediction. The outcome, as I will show, is an unfortunate misconception of future oriented speech acts in general and predictions in particular. My proposal consists in replacing this misconception by incorporating into our taxonomy the subclass speech act of *prospections*.

One useful way of executing the task is to invoke Searle's notion of *illocutionary point* (i.e., the purpose of a speaker in making an utterance) and contrast [9b] with the case of promises. In effect, if the illocutionary point of making a promise is the "undertaking of an obligation by the speaker to do something" (1979: 2), an interesting point of contrast to the case of non-predictive [9b] is that only in the latter case, but not in the former, the referred course of events does *not* tend to be within the reach of speaker's agency (in the sense that the speaker is not to decide at which time the train at issue will depart). Simply put: by uttering [9b], the speaker is not committing to a course of action, he is only saying how things are going to turn out. I think this point is simply captured by the claim that the illocutionary point of uttering [9b] is to *report* a future event or state of affairs. However, this rather obvious claim is tackled as soon as we attempt to integrate it into SV's standard taxonomy, as there seems to be not the slightest suggestion in its categorization of an illocutionary point that reports a future event or state of affairs *and* is not a prediction. The effect of this rather arbitrary restriction is already clear: the traditional notion of prediction seems to be mistakenly broad as to include utterances such as [9b], and as soon as an utterance of this type is classed as a *prediction*, it tends not to be considered a *report*. As a matter of fact, Searle's claim strongly suggests that any future statement for which the speaker holds supporting evidence is a prediction *and not a report*:

> The differences, for example, between a report and a prediction involve the fact that a prediction must be about the future whereas a report can be about the past or present (1979: 6).

Again, it is true that the above does not preclude future reports from constituting a *sui generis* speech act on their own, as Searle only claims that reports *can be* (rather than *must be*) about the past and the present. But the fact that there is no characterization of what a future report might be raises the question as to whether this omission leaves too much open ground for predictions to cover. In effect, as far

as I can see, there is nothing contradictory in a report about the future that is not meant as a prediction.[13] Timetables in train stations all over the world are good examples. Annual fixtures of sport competitions are another. The information displayed in these prospective schemes is, in most cases, fully descriptive and accurate, and it can be quite misleading to describe the agents responsible for the delivery of this information as merely predicting. Intuitively, timetables are meant to inform, not to predict. And it is rather obscure how to account for their place in the natural taxonomy of future-oriented speech acts within SV's simplistic account.

Space prevents me to develop a full diagnosis of the source of SV's ungrounded assumption, but I suspect that a too heavily representational picture of assertion misreads the role of linguistic communication in general and predictions in particular. All in all, the only common aspect that one could trace as a continuum all along the wide range of speech acts called assertions, is representational in nature: to assert is, essentially, to represent the world's state of affairs. Asserting, in this view, establishes a distal relation to the world. And predicting, which is naturally an assertive subtype of speech act, establishes the same kind of relation, only with a non-actualized world that happens to be located in the future. My proposal in the following pages is that, instead of accounting for this rather large and uniform range of illocutionary acts, by means of an excessively broad and counterintuitive conception of prediction, one should better do two things: first, define *prospection* as a *sui generis* subtype of assertive speech act, and second, offer a more intuitive notion of prediction, by replacing SV's representational view with a framework that allows a more complete and dynamic account of linguistic communication and assertions in general.

The first task mentioned above can be easily carried out by stating the following (already familiar) definition:

[10] *Prospection* (Def.): An assertion with the propositional content condition that the propositional content is future with respect to the time of the utterance and the additional preparatory condition that the speaker has evidence in support of the proposition.

As expected, [10] is virtually identical to SD. This is explained by the fact that my proposal consists in replacing SV's two-fold distinction between assertions and predictions by a tripartite distinction between *assertions*, (what I refer to as) *prospections*, and (what are properly called) *predictions*. In this tripartite distinction, *prospections* are defined exactly as predictions (mistakenly) were, whereas predictions are tentatively redefined by adding the qualification on non-deferential evidence which I have introduced above.

Having reached a proper definition for prospections, then, our second task requires some justification. Why are we in the need of replacing SV's distal representational conception with another theoretical framework? A straight answer to this question is given by some authors in the field (Groenendijk et al., 1996; Kissine, 2013, *inter alia*) and points to the general fact that representing the world

is not an essential feature of asserting. There are other elements, concerning participants' knowledge of both context and conversational rules, that are also necessary for a successful assertion to be performed. As one author put it, "I am reluctant to say that I have performed a successful assertion by telling an eight-year-old child that most formal systems are incomplete (although I have represented how the world is)" (Kissine, 2013: 63).

Now, one particular framework that has been developed in the last decades, with interesting results within and beyond pragmatics, is what has become known as "dynamic approaches to meaning." By this I will refer to a selected group of theories that advocate the view that the meaning of a proposition amounts not to what it represents, but to its capacity to produce changes and effects on the world (or, more specifically, on what these theories conceive as "context"). At first sight, this idea does not seem to express any theoretical novelty: that the meaning of a proposition has effects on the world or context was explicitly acknowledged by SV. In effect, the notion of perlocutionary effect captures that particular idea to a great extent. Yet, what becomes revealing in the dynamic approaches to meaning is, first, a more abstract and systematic notion of context, and second, a more integral model of its interactions with content. To take a prototypical example, consider the dynamic view advocated by Stalnaker (1973, 1999, 2002), whereby context is defined as the body of information that is taken for granted or presupposed by participants in conversation (cf. 1973: 448; 1999: 6, 53, 84, 98). What such a conception basically does is to equate context to a set of propositions or, in more heuristic terms, to the set of possible worlds in which those propositions are true – what Stalnaker calls the *context set* (1999: 6, 84–85, 99). This definitional move from propositions to possible worlds not only makes available a more abstract and operational representation of propositions, but also a much more dynamic picture of linguistic communication. In effect, if a proposition is conceived as a function from possible worlds into truth-values, and the context set as the set of possible worlds which contains all propositions that are taken to be true by participants, what the expression of a proposition in a particular context at a time attains is, essentially, to reduce the context set from a prior to a subsequent set of possible worlds compatible with the content of that proposition (cf. 1999: 86). Furthermore, to the extent that context is characterized as a platform for an ever-changing process whereby participants distinguish "among alternative possible ways things may be" (1999: 85), the context-content interaction can be properly understood by a double order of influence: from context to content, and conversely, from content to context (cf. 1999: 4, 98). The first order of influence (context determines content) discloses context as a function from sentences to propositions, insofar as semantic rules for a natural language match sentences with propositions relative to a context (cf. Stalnaker, 1999: 34, 36). The second direction (content changes context) reveals how the resulting propositional content changes the context itself, by adding such content into what is mutually accepted (and eliminating what is incompatible). Thus, on Stalnaker's model of linguistic communication, assertion

is described not in terms of how content "reflects" or "represents" context, but in terms of how context and content determine each other functionally. And that is arguably a much more alive picture than the distal view advocated by SV.

Of course, a note of concern at this point may be that some sort of "distal representation" is still in play here, given the centrality of the concept of information in Stalnaker's and many other dynamic accounts. For, to convey information about some state of affairs involving *x* is, arguably, to represent *x* as being a constitutive element of that state of affairs. And indeed, one natural motivation in many of these approaches, the contribution of which is specially appealing to what has been called "dynamic semantics" (cf. Nouwen et al., 2016; Groenendijk and Stokhof, 1991, *inter alia*), is to confer the concept of information some central role. Thus, according to most views within this framework, what an assertion essentially does is to update the background informational states of participants (or, in functional terms: map one informational state into another). Needless to say, the idea can be exploited to a great potential, but one particular query that has arisen, as authors approached more pragmatic arenas, is whether the concept of information is actually essential to a correct abstract account of asserting. Invoking an instructive analogy between language and games, Max Kölbel has suggested that it is not: conveying information is only an ultimate aim of assertion (as having fun is for games) and should be distinguished from what are its immediate constitutive objectives (as, for language and games, changing the score is):

> […] there is in language a distinction analogous to the distinction between the *immediate objective* of a game – that is, changing the score – and the *ultimate aim* of that game – for example, having fun, entertaining, making money, impressing someone, and so on. […] Many people believe that the key to understanding language is that its central aim is the exchange of information. In my view, however, the exchange of information is only one among many ultimate purposes that linguistic exchanges can have. When we converse in pursuit of the aim of information exchange, we do so *by* pursuing the language-internal objective of changing the conversational score, an objective that can serve many other aims too. […] What is characteristic of assertion is the effect it has on the conversational score, and it is *through* this language-internal effect that we, sometimes, effect the transmission of information (Kölbel, 2011: 50–51).

According to Kölbel's view, then, what is characteristic of an assertion are the changes that it introduces into what he calls "conversational score." The notion, first introduced by Lewis' seminal paper (1979), is relatively equivalent to Stalnaker's "presupposition set" (1973: 450), "context set" (1978: 84), and "common ground" (2002: 701). In effect, inspired by Stalnaker's early motivations,[14] Kölbel characterizes the mentioned changes as comprising one single and abstract "essential effect": namely, the effect of adding the content of what is expressed by a proposition into the score. Interestingly, though, such an essential effect does not provide, as Stalnaker himself acknowledged (cf. 1999: 86–87), a definition: other

things that are not assertions (e.g., suppositions) can have the same effect. The natural conclusion being that the essential effect can only constitute a necessary, but not a sufficient condition of the notion. Kölbel takes this as an incentive to fill the gap and provide the remaining definitional components. Building on Brandom's work (1983, 1994), Kölbel relates the additional elements to the normative consequences an assertion imposes on participants, "such as the obligation to provide a justification if asked to give one" (2011: 66). Even though Kölbel's intention is to present a simplified account of such normative effects, for the purpose of our survey it is important to emphasize that the "dual structure of authority and responsibility" that Brandom's original account ascribes to assertional practices (1983: 643), consist in: (i) the right of authorizing or licensing further assertion of one's claim, and (ii) the justificatory responsibility of vindicating one's claim if challenged. This double structure suits nicely the different status that an assertion can display within an inferential frame, both as a premise or as a conclusion of inferences (1983: 646). On the one hand, in licensing others to assert her claim, an asserter licenses an inferential chain in which her original claim works as a premise. On the other hand, in justifying her claims, the asserter makes explicit the inferential chain in which the assertion appears as a conclusion. By this token, the other participants can react in many different ways to an assertion, two of which are especially relevant: either they can challenge a speaker's assertion and evaluate her justification for bestowal or deprivation of its social force, or they can re-assert the claim and defer to the original speaker its justificatory responsibility. The latter move entails that an assertion can be made on the basis of personal deference and make use of that fact in justifying one's claim.

All in all, on Kölbel's view, a satisfactory account of assertion should not only point to something more "immediate" than conveying information (for conveying information is only an ultimate aim of assertion), but *additionally* to something more normative in nature (for changing the conversational score is characteristic of many linguistic acts, not only of assertion). The upshot is an integrated conception of linguistic communication, whereby the notion of assertion is explained by a dual standard: rules of score (e.g., the essential effect on the score) and normative principles (e.g., the rights and obligations that participants undertake by being participants in conversation).

Before considering how this picture can be applied to the case of predictions, let us first examine how Kölbel's rules and principles are spelled out. To simplify, I will only reflect on a basic subset of his formulations (for full details, see Kölbel, 2011: 60–72). Consider, then, the following two rules and two principles: one basic rule of score for assertion, one basic rule of score for supposition, a general normative conversational principle and a specific normative principle for assertion (correspondingly, Kölbel's SC2, SC5, NC1 and NC2).

[KRS1] If a participant asserts that *p* and the assertion is not rejected by any participant, then *p* becomes accepted. (If not-*p* was accepted at the time of assertion,

then not-*p* is removed from the score together with propositions that obviously require not-*p*.)

[KRS2] If a participant proposes to suppose that *p* then, if no one objects, *p* is accepted temporarily. When the supposition is dropped again, all changes in the score that depend on the supposition that *p* will be reversed.

[KNP1] It is appropriate to make a linguistic move only if it is likely to change the score in ways that further the aim of the conversation.

[KNP2] If a participant asserts that *p*, then he or she thereby undertakes the obligation to justify* *p* upon request. (From Kölbel, 2011: 61–62, 68; my "*" in KNP2.)

Three brief comments are in place. First, the conditional qualification on both assertions and suppositions rules KRS1 and KRS2 (marked by expressions such as "if… not rejected" and "if no one objects") are of a different kind: while in the former rule the potential objection to *p* concerns, essentially, its truthfulness, the potential objection to *p* in the latter can only concern other related aspects, such as its utility, consistency or conceivability. This is given by the fact that a supposition does not, in principle, aim at truth, and consequently, any objection that a participant can make by not accepting its content into the score cannot concern truth itself. If you propose to suppose that animal species had never evolved, I cannot object to your supposition in terms of its (presupposed) falsehood, but only in terms of the utility and perhaps conceavibility of such a supposition.

Second, one important addendum to the dynamic tenet formulated in KRS1 is that the score's changes can be described not only in terms of the propositional contents added to (or eliminated from) the score, but also in terms of the overt linguistic act that is being recorded. In other words, if *p* is asserted by a participant *P*, not only *p* is added to the score (if not challenged), but also the fact that *P* asserted that *p* (Kölbel calls this the *conversational record*: p. 64; cf. also Stalnaker, 1999: 101–102). In effect, as we shall later see, this information is not only conceptually distinct, but the source of a temporarily distinguishable event. This will prove relevant, and I would say, essential, to cases such as betting and predicting.

Third, my insertion of "*" in KNP2 aims to distinguish a sense of "justify" that is far more general than the one I will introduce in a later stage for the case of predicting. For now, justify* includes, broadly, a wide variety of warrants (observational, inferential, deferential, etc.).

Let us now take a step forward, before assessing the case of predicting, and consider an interesting intermediate case: *placing bets*. Arguably, this particular speech act must share with predictions some relevant aspects, insofar as both types of illocutions are (prototypically) future oriented and, moreover, truth-assessable: I can not only predict that Manchester City will defeat Liverpool (against your own convictions), but we can place a bet on it, making the relevant events an objective

truth-assessable standard to determine who was right and who was wrong. And, in effect, as soon as one reflects on the rules of score that this might bring to the particular case of betting, a different variety of acceptance comes into play: as opposed to prototypical cases of assertion, it seems that participants in a bet can accept, in performing the very linguistic act of betting, each other's contradictory claims. To illustrate this simple point, let *C* stand for any conversation, *P1* and *P2* for participants, $t_1 \ldots t_2$ for subsequent temporal intervals in a $t_1 < t_2$ order, and "…" some elapsing time (conversation omitted). In the following examples, *C1* illustrates an odd and unacceptable assertional conversational frame, *C2* a simple case of supposing, and *C3* a simple case of betting.

#C1: asserting
[11] Paris is the capital of France (*P1* at t_1).
[12] Okay, Paris is not the capital of France (*P2* at t_2).

C2: *supposing*
[13] Let us suppose that Mary is a spy (*P1*, at t_1).
…
[14] Let us now suppose that Mary is not a spy (*P2*, at t_2).

C3: betting
[15] (I bet) Heads! (*P1* at t_1).
[16] Okay. (I bet) Tails! (*P2* at t_2).

As it is evident, *C1* is at odds with KNP1 and, more specifically, with Stalnaker's claim that a participant "will not (…) assert things incompatible with the common background" (1999: 49; cf. also 1973: 450). The constraint thus expressed supports the idea that, by asserting, participants want "to reduce the context set, but not to eliminate it altogether" (1999: 89). Thus, the consistency of the score imposes a rational constraint not only on asserting, but perhaps at a more abstract level, on every linguistic move that Stalnaker classes as "acceptance." When one considers *C2* and *C3*, though, this same constraint reveals a new guise, for both conversational frames are manifestly admissible despite its *prima facie* inconsistency: one participant proposes to suppose one thing, then the other proposes to suppose its contrary; one participant bets on one thing, then the other bets on the opposite. How can these admissible cases of linguistic exchange be accounted for within the framework of a consistent conversational score?

Conversations of the type *C*2 are easily explained away by the fact that a score is to be described and evaluated in terms of its synchronic states at a time. And in that sense, nothing like inconsistency is threatening *C2*: *p* is accepted at t_1, *then dropped*, and then not-*p* is accepted at t_2 (and then dropped). Insofar as "the state[s] of [the] context at any given moment" (1999: 86) are consistent, acceptance of the contents expressed by [13] and [14] comply with both KNP1 and KRS2. Intuitively, we can suppose that *p* (explore its consequences), and then drop it and suppose that

not-*p* (and explore its consequences). But we cannot rationally explore the consequences of the supposition that '*p* and not-*p*' at any single temporal stage.

When one considers *C3*, though, acceptance reveals yet another aspect, different from those exhibited in both assertional and suppositional frames. Let us reflect, first, on the putative rule of score. It seems clear that in betting that *p*, the alleged acceptance of [15] and [16]'s contents (in full: *the coin will turn heads/tails*), goes potentially beyond the limits of conversation (if, say, participants place a bet today for a flipping-the-coin kind of event taking place tomorrow). Moreover, the acceptance of the content will be assessed (or perhaps: retrospectively re-assessed) only relatively to the relevant facts *once* the coin is eventually flipped. In other words, there is a fact of the matter in respect to which the contents of [15] and [16] are to be truth-assessed. And this is clearly not the case of suppositions, as participants can indulge in counterfactual explorations (e.g., "Suppose that Napoleon never invaded Russia"). Thus, while the content of a supposition can in principle dispense with truth-assessment, the content of a bet must not, insofar as the relevant facts will determine correctness, and consequently, the rewarding effects that constitute the social and conceptual background of betting.

At this point, our current query can be reformulated in more technical terms: if the notion of betting is conceptually linked to truth-assessment, how can we make sense of the seeming inconsistency in conversational frames such as *C3*? The case raises some interest in that, as opposed to core cases of assertion (which, in turn, constitutes the paradigmatic case of truth-assessability), a conversational frame such as *C3* displays no "conversational crisis"[15] when one participant expresses a content that is manifestly incompatible with what has already been accepted into the score.

One crucial point that is worth to reflect on, at this stage, is that the so called "essential effect" might have slightly changed its stage-setting. For it seems to me that what is essential in *C3*, and in cases of betting in general, is not so much to accept *p* into the score, but to record that *this* particular participant bets on *p*. We have already pointed out that this information (namely, the *record*) is incorporated into the score at a conceptually distinct stage from that specifically related to content. In effect, in an interesting passage (1999: 101–102), Stalnaker suggests that this overt incorporation can, in principle, occupy an interval of time prior to the content being added:

> The prior context that is relevant to the interpretation of a speech act is the context as it is changed by the fact that the speech act was made, but prior to the acceptance or rejection of the speech act. A successful statement will thus change the context in two different ways that need to be distinguished. First, the fact that the statement was made is information that is added to the context simply as a result of the fact that it is a manifestly observable event that it was made. Second (assuming the statement is not rejected), the content of assertion will be added to the context. One might imagine a formal language game in which the two kinds of change takes place successively (1999: 101–102).

This seems to suggest that adding the record and adding the content are not merely two aspects of the same event but, potentially at least, two distinguishable events altogether. And my particular suggestion is that, in conversational frames that characteristically represent core cases of betting, it is the prior event that should be identified as the essential effect, not the latter.

It is important to stress that this claim (i.e., that content is not being added to the score in *C3*) does not rely on participant's P2 (reluctant) *beliefs* about what the first bettor envisages, but on both participants' overt public attitudes. This is not only aligned with Kölbel's motivation for treating the notions of acceptance and score non-reductively, in social or conventional terms, but also provides a better understanding of the actual linguistic moves in a betting conversational frame. For, independently of what her inner beliefs are, the second participant's public behavior is one of an entitled participant that treats the first participant's statement, *not* as true (nor *as if* she takes its truth for granted), but rather as one of a selected range of possibilities. And this is something that the different states of the score, all along the conversation, can account for. In effect, upon reflection, the presupposition set relevant for a flipping-the-coin type of bet must contain both modalised propositions "possibly heads" and "possibly tails," at any time during the conversation, and they remain to be in the set after the bets are placed. No reduction of the context set is effected by means of bettors statements (though perhaps only incidentally, as a collateral effect of specific internal regulations).[16] In pure pragmatic terms, the background presuppositions remain in the context set as true after the first bettor, and the second, have placed their bets, and their social behavior (despite what their true beliefs are) accounts for it.[17]

Now, does the above entail that acceptance plays no role in a betting conversational frame? Not entirely so. For first, the modalised presuppositions need not be part of the score prior the time of speech: they can be incorporated by the very act of betting (think of a bet on the lines of "I bet you that George will wear that yellow tie at his own funeral" to see more sharply the point).[18] Thus, it might be reasonable to recognize that in "accepting" someone's bet, even though one is not straightforwardly accepting the bettor's statement as if true, one accepts the set of possibilities that his statement brings along, to then bet on one element of that set ("I bet he will not," "I bet he will wear the red flowery one"), or refuse to participate in the bet for other reasons (cruelty, disrespect, inappropriateness, etc.).

Second, even if the contents expressed by both participants in *C3* are inert with respect to any "reductive effect" on the score, this innocuousness is only temporary: by being "stocked" in the record, the content themselves remain pending for a subsequent point of re-assessment, whereby the facts prove retrospectively whose statement was right and whose wrong. Only *then* the conversational score can be modified by reducing the score accordingly. Of course, this later effect takes place *independently*, and *in virtue of the facts*. In other words: it is the world that speaks at this subsequent point.[19] However, in some interesting cases, albeit not all, the very linguistic act that give rise to a bet stage-setting, can reasonably be taken to be

the responsible to trigger the chain of events that eventually determines truth (in the sense that if the first participant had never said "heads," the bet would have never taken place, and the coin would have never been flipped).

Having a clear picture of how the score is regulated in speech acts cases that are prototypical of betting, let me now turn briefly to its normative principles. The case makes immediately clear a difference between asserting, on one hand, and supposing and betting, on the other: while the asserter undertakes the obligation of justifying his claim (if challenged), no such constraint is imposed on supposing and betting. Certainly, there are *other* normative constraints of an even more social character (in betting, all the paying and rewarding commitments), but the crucial point is that none of these are of a *justificatory* kind: one cannot be obliged to justify *why* heads and not tails, for even a blind guess would be accepted as a sound bet.[20]

To sum up, then, betting is different from both asserting and supposing in that (i) it is the record, and not the content, what is essentially added to the score; and different from assertion (and similar to supposing) in that (ii) no justificatory constraints are imposed on participants.

With these sketchy notes on view, we are now in a position to address the case of predicting. In order to reach a clear understanding on its rules of score, let us first draw a conversational frame analogous with the ones we have been reflecting on:

C6: predicting
[17] (I predict that) Mr. Holmes will resign before Spring break (*P1* at t_1).

[18] (I predict that) Mr. Holmes will not resign before Spring break (*P2* at t_2).

The natural question arises as to whether: (i) participant *P2*, by uttering [18], is rejecting to accept [17]'s content into the score, or (ii) by analogy with the case of betting, none of the predictive contents are straightforwardly accepted (at least not until a subsequent point of truth-assessment settles the truth of the matter). To solve this query, I would like to suggest that, as "accepting" is conceptually linked to "agreeing" (in the trivial sense that if one accept *p* into the score, one agrees that *p*), a simple test initially suggests that the former picture, but not the later, is correct. In effect, this picture comes naturally when one reflects on the fact that a claim such as "I disagree" can naturally be placed ahead of [18] to render [20], whereas in (at least core) cases of betting the result is rather odd:

C7: *predicting*
[19] (I predict that) Mr. Holmes will resign before Easter break (*P1* at t_1).
…
[20] I disagree. (I predict that) Mr. Holmes will not resign before Easter break (*P2* at t_2).

C8: *betting*
[21] (I bet) Heads (*P1* at t_1).

…
[22] I disagree. (I bet) Tails (*P2* at t_2).

It seems that a natural description of *C7* would be to say that *P2* is refusing to accept [19]'s content into the score by issuing his own prediction. In contrast, the addition of "I disagree" in *C8* triggers an odd effect in the conversation. Moreover, it is reasonable to think that (judgment of taste and such notwithstanding), if disagreement is in place, so is the possibility of acceptance (in the sense that if there is a fact of the matter where participants objectively can disagree about, there is also a correct judgment to eventually accept into the score). This suggests that, *prima facie*, in predictive conversational frames acceptance has a regulatory role to play.

It is worth noticing, though, that we are looking for regulatory constraints, not merely descriptive generalizations. This means that we are interested not in what predictors usually do, but in what they can and cannot do. And it is a telling fact that predictive conversational frames such as *C7* are, if anything, only one shape the conversation can take, among many. In effect, more often than not, participants can and do remain neutral regarding the other participant's predictions, as the following conversation illustrates:

C9: *predicting*
[23] (I predict that) Mr. Holmes will resign before Spring break (*P1* at t_1).

[24] Is that so? / Interesting… (*P2*, at t_2).

Leaving aside possible cases of irony, what I think *P2* attains by such a neutral stance is neither to reject nor accept P1's expressed proposition (perhaps in the same way as a passive participant witnesses a bet).[21] In effect, such a neutrality can even be depicted in conversational frames in which the second participant makes his own predictions but expresses no intention whatsoever to "prove" his point or "discard" his opponents' claim (call this the "time will tell" attitude). What is crucial here is that despite the fact that disagreement is sometimes expressed, participants *can* in principle remain neutral and adopt a "time will tell" attitude. And, in a reasonable analogy to the case of betting, the effect of this potential neutrality relies not on the addition of the propositional content into the score, but on leaving trace of the record.[22]

Naturally, this neutrality will not last forever: time *will* tell. Specifically, the future events that are the very subject matter of the prediction's propositional content, will eventually supply an objective standard for truth-assessment, and not only prove the truth or falsehood of the recorded statements, but change the score accordingly. Of course, as in the case of betting, this procrastinated change in the score constitutes the effect of facts that are independent of participants' claims. Notice, however, that truth-assessment not only creates a normative channel between the relevant facts and the score (Brandom's *world asserter*), *but also between the*

relevant facts and participants: in tracking the record and truth-assessing the proposition stocked, a linguistic community not only proves that the asserted contents expressed by the predictor were true or false – it also proves *him* right or wrong.

All of which supplies substantial matter for a simple formulation of a rule of score for predicting:

[PRS] If a participant predicts that *p*, the record that he predicted *p* is added to the score, and a subsequent point of truth-assessment will prove *him* right or wrong.

There are varying conceptual modes to describe the ways of a linguistic community to an individual (cf. Brandom, 1983; Kripke, 2004, for some suggestive ideas). Space prevents me from developing a full-blown picture. Instead, I would like to focus on one normative corollary of PRS. For, if keeping a record serves for the retrospective *personal* valuation of the predictor, the justificatory responsibilities that he is committed to, *as* a predictor *by* issuing his prediction, must not defer the content of his statement to another asserter's assertion. And, in effect, as soon as one reflects on a normative principle for predicting, the need to stipulate a contrasting point to the case of standard assertion immediately arises: as it has been suggested all along in this paper, it seems evident that predicting (unlike suppositions and bets) does require justification (so as not to turn a statement into a blind guess), but *not any* type of justification. Unlike standard assertions *and prospections* (to recall: the man in the station), the predictor cannot defer his assertion to another asserter. It is his own, genuine and personal commitment what is being essentially accepted into the record. By contrast, insofar as the man in the station justifies his claim by pointing to a timetable, he would be justified in issuing a common assertion, but we would not consider him as issuing a prediction. This could be easily captured in the following normative constraint:

[PNP] If a participant predicts that *p*, then he or she thereby undertakes the obligation to justify** *p* upon request (where justify** means "justify on the base of a restricted type of warrants, *non-deferential* in kind").

Interestingly, applied to our main example, the principle suggests that justification unveils illocutionary force. And it seems reasonable, indeed, that in justifying her claims a speaker clarifies how she meant what she said. The whole point of our example was that a statement like "The train to Liverpool will depart at 11:00" can be meant alternatively as a prospection or as a prediction, perhaps even as a promise, depending on the speaker's circumstances. In case the context does not make it clear what her intentions were (how she meant what she said), justification can be a telling factor. In effect, one way, among others, to clarify the illocutionary point of an utterance (and consequently, its force) is to be responsive to a question such as "Why do you say so?" issued by the challenger (who might not be interested in revealing how true the statement is likely to be, but simply in how it

was meant). By pointing to the timetable, the man on the station would make clear that he is not making any prediction, but just conveying information from one reputable source: that he is committed to the content by being licensed by the timetable. But if the man on the street were similarly asked to justify his prediction, he would have to reformulate his pondering, perhaps the whole inferential chain that led him to his personal conclusion. And that, of course, is a prototypical example of what a prediction is, what a prediction demand and what a predictor does.

The approach proposed in the above has also a clarifying effect on our second set of examples – the ones related to obligations, repeated here:

[25] *Predictive scenario*: John's manager is deciding tonight's repertoire but has not issued an order yet. Participants speculate and make their predictions.
a. John will have to sing boleros (tonight). OK
b. ?? John has to sing boleros (tonight).

[26] *Prospective scenario*: John's manager has reached a decision and ordered him to sing boleros tonight. Speaker informs the addressee about this.
a. John will have to sing boleros (tonight). OK
b. John has to sing boleros (tonight). OK

To recall, only [25a] is fully predicting an obligation, as the triggering fact of the obligation (the manager's order) is asserted to occur to the future of utterance time. In contrast, the prospective scenario is by hypothesis one in which the order has already been issued, and the speaker is therefore reporting a current obligational state of John (which is confirmed by the present simple alternation).

Now, let's add a further assumption. Let's suppose that in none of these scenarios John ends up singing boleros, but rancheras instead. Let's further assume that in the predictive scenario, he receives a different order than the predicted one, whereas in the prospective one, John simply *disobeyed* the reported order (that, recall, was already issued at speech time). Now, it is interesting how the different factors can be accounted for in our proposal. Let's first examine the predictive case. According to PRS, by adding the record to the score, participants leave an illocutionary trace that is retrospectively assessed once the relevant facts become a standard of truth assessment. Thus, in our example, future facts about John prove the predictor wrong: it turned out that John's manager ordered him to sing rancheras, so the predictor's dictum about John's future obligations was mistaken. If asked to justify his initial prediction, the speaker can spell out all the inferential chain that led him to conclude that John's manager was going to order him to sing boleros, and acknowledge that he was wrong. Depending on his justification (*inter alia*), his reputation as a predictor is more or less affected.

What about the speaker in the prospective scenario? Was *he* wrong? I think the correct answer to this question is that he wasn't: John *had* to sing boleros at some temporal point (and that is why we say that he eventually *disobeyed*). This simple fact supports the consistency of our illocutionary distinction: what was essentially

added into the prospective score (but wasn't for the predictive one) was an obligational ascription (which, recall, could have also been expressed with the present simple alternation "John *has* to sing boleros"). This is why the prospector's justification is deferential: he was told from a reputable source (John himself) that there *was* a deontic/commissive state of affairs in force, and what the speaker did by uttering [26a] was simply to *report* about it. Thus, what superficially seemed to be (by SD standards) a pure predictive assertion, was not: the primitive future semantics of [26a] triggered other illocutionary force, different from prediction. Crucially, in virtue of an analysis sensitive to what is (and what is not) added into a conversational score, we can account for these illocutionary differences.

4. Conclusion

The following table summarizes the results of my examination. For clarity, non-essential effects appear in square brackets (CS stands for conversational score):[23]

Force	Essential Effect	Normative Constraint
Assert *p*	Add *p* to CS [and add record to CS]	Justify* *p*
Prospect *p*	Add *p* to CS [and add record to CS]	Justify* *p*
Suppose *p*	Add *p* temporarily to C [and add record to CS]	No justificatory responsibility
Bet *p*	Add record to CS	No justificatory responsibility
Predict *p*	Add record to CS	Justify** *p*

One final query, if only to suggest a discussion: if adding the record (rather than accepting the content) is a prediction's essential effect, to what extent are predictions a subtype of assertions? One possibility is to assume that predictions are not assertions simply on the basis of Stalnaker and Kölbel's claim that adding content to the score is essential to assertion. However, this would be highly counterintuitive, given the two other components of predicting: its truth-assessability and the justificatory responsibilities. A second alternative is to claim that predictions are a subtype of assertions only in virtue of their truth-assessability. This would allow, among other things, that bets qualify as assertions (something not entirely intuitive, as the disagreement test shows). I would like to suggest, then, a third possibility: what is an essential aspect of assertions in general, and predictions, in particular, relies in its justificatory responsibilities. This entails that the essential effect of assertions, in general, relies not on adding content to the score (although, of course, this might be the case), but on imposing normative (and specifically: justificatory) constraints on the asserters. This would allow prospections and predictions (but not bets) as assertion subtypes, an arguably desirable result. It seems to me that this simple move is akin to a basic intuition: to assert (in a broad sense, including predictions and prospections) that *p*, is to be committed to justify *p*, independently if the content is added or meant to be added to the score.[24]

Author Contributions
The author confirms being the sole contributor of this work and approved it for publication.

Conflict of Interest Statement
The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

NOTES

1. See for example Enç (1996) and, more recently, Giannakidou and Mari (2017).

2. SV will refer, then, to classical Speech Act Theory, which is epitomized by Searle's seminal 1969, reviewed in his 1975a and 1975b, and formally refurnished in his collaborative work with Vanderveken (Searle and Vanderveken, 1985). As the principles of SV are widely known, I will only develop a sketchy outline, as I go along with the main discussion. This will bring into focus only those aspects of the theory that have a substantial bearing on our subject matter and that are particularly relevant for the critical review of SD in this section.

3. In the strict sense, Searle's analysis of illocutionary acts first spells out a set of necessary and sufficient conditions, and subsequently extracts from those conditions a set of semantic rules. While the former are conditions for the performance of the defined speech acts, the latter are rules for the use of the linguistic device responsible for making a particular utterance a special kind of speech act (cf. 1969: 22).

4. I thank two anonymous reviewers for pointing out to me this particular problem. I am inclined to think that some subclass of scientific predictions can also be referred to to illustrate the point. In effect, a linguistic theory can be said to predict some feature of an extinct language in more or less the same way as a natural science theory can be said to predict past events about dinosaurs. Arguably, past tensed sentences would be easily construable to report on the predictions being made. For the sake of concreteness, though, scientific predictions (and non-future tensed constructions more generally), will be set aside in this paper for the reason I explain above.

5. It is, of course, a totally different scenario when people predict whether (and if so, for when) a sitting government will call a snap election, for the simple reason that the prediction would be made before the election has actually been scheduled.

6. For the confined purpose of this paper, I assume that events are particulars (rather than universals, cf. Montague, 1969: 149–150; and Chisholm, 1970: 20; and Pianesi & Varzi, 2000, for an instructive synthesis), but remain neutral on other metaphysical issues, such as individuation criteria and ontological thickness. I am sympathetic to the idea of inertiality and non-inertiality as instantiated aspects of one and the same event token. As far as I can see, there is nothing contradictory in the idea that these opposite properties emerge during the event denoument ("an event may come to acquire new properties as the result of later happenings," Pianesi & Varzi, 2000: 16). All in all, the fine-grained metaphysics of events (whether we think of inertiality and non-inertiality either as discerning properties of distinct events or as emerging aspects of one and the same event), does not affect the central point of my insight.

7. As already mentioned, a rule like this is meant to guide the use of what Searle calls "illocutionary force indicating device" (sometimes called "a function indicating device," cf. 1965: 6; 1969: 30; 1985: 2), referred here as *PRO*, where *PRO* (p) represents the illocutionary

force indicating device (for promising) having scope over a proposition. A proposition is taken to be, in an uncontroversial fashion, what is expressed by the speaker in a context when he utters a sentence.

8. It is worth noticing that this point raises an interesting temporal constraint regarding the ascribability of an undetermined range of speech acts, presumably future oriented ones. Take a preparatory condition that defines an illocutionary force F in terms of how an aspect A of a referred event E is recognized by participants at speech time T. The constraint relates to cases in which the ultimate objective nature of E reveals to be non-A at T' (where T < T'), and stipulates that this shall not force a reassessment of the original ascription (and "backtrack" from F to non-F). To put a concrete example, consider threats. Arguably, one preparatory condition on such speech act is that the propositional content of the threat is undesirable for the addressee at T. Now, it might turn out that what was undesirable at T becomes strongly wished for by the same addressee at T'. But it seems clear that this does not impose any reassessment of the ascription of the original speech act, which was meant and recorded as a threat.

9. Cf. Brandom (1983) for a detailed account of the authorizing processes in assertional practices.

10. I thank an anonymous reviewer for pointing out to me that the clarification in italics was essential: if what Cristina reported to the speaker were that she *predicts* that she will ultimately choose Paris as a summer destination (not that she has already decided that and, say, scheduled a flight), then perhaps we should qualify the asserter claim as a prediction after all.

11. I used the *second-order* terminology instead of the *higher-order* one that has come to the fore in recent epistemological discussions (Christensen, 2010; Kelly, 2010), only because the evidence that is relevant for determining illocutionary force does not necessarily reveals the *defeasibility* of first-order evidence, but more precisely its origin or "source-route".

12. Interesting semantic questions arise at this juncture: what is precisely the semantic contribution of the future marker *will* in the non-predictive scenario? How can we account for the fact that the deontic semi-modal *have to* is under the scope of the future morpheme in the non-predictive reading of [6]? Prima facie, the future marker seems not only innocuous to the temporal location of the enforcing circumstances in the relevant scenario: it also leaves completely underspecified the temporal range of the subject's obligational state. I offer a full semantically-driven analysis of this and other technical issues regarding the semantics of future obligations in Fuentes (*in prep.*).

13. As this might be a controversial remark, and it is likely to be rejected on the base that one cannot report an inexistent state of affairs, I would like to point out that it may be worth reflecting on how tense shapes our judgments on the matter. For certainly I concede that one cannot possibly report how the future *is* (unless, of course, one holds a deterministic view of the universe). However, notice that there is nothing in the notion of report that precludes the idea of reporting how, in view of the inertial course of events, the future *will* be. If it is further argued that this cannot be a report on the more epistemological ground that the alluded inertial course of events is fallible (and hence, that future is uncertain), it should be born in mind that many reports about past and current state of affairs may also be subject of uncertainty. Arguably, there is nothing unconceivable in the idea that a reporter on a civil war delivers more uncertain data than a reliable timetable, from a reputable railway company, does. One further point to reflect on is the pragmatic acceptability of orders such as "Jones, I need a report of what possible scenarios Chinese

economy will confront next year," in comparison to the also acceptable "Jones, I need a report of what possible scenarios Chinese economy would have confronted today, had Mr. Chung been elected last year." As far as I can see, there is nothing contradictory in the idea that reporting about a (possible, unrealized) future parallels reporting about a (possible, unrealized) past. Further research is needed at this point. I thank two anonymous reviewers for useful comments and discussion on this contentious issue.

14. Kölbel interpretation of Stalnaker's work compellingly suggest that, despite the fact that his early work made use of propositional attitudes terminology, his attempts of reaching a non-reductive definition of speaker presupposition point to a conceptual link between this notion and the rules of score that govern linguistic exchange. This is what motivates Kölbel to present a simplified account of linguistic communication and assertion in particular. One advantage of the non-reductive account that he recommends is, thus, that it raises no need of referring to iterated beliefs, an issue about which Stalnaker himself has been somewhat ambivalent. In this regard, it is of considerable theoretical interest (although beyond the specific purpose of this article) to determine the extent to which Kölbel's non-reductive approach copes with the difficulties ascribed to cognitive conceptions of context, and especially with the demand of a more objective notion of it (see Sbisà, 2002). I thank an anonymous reviewer for bringing up this point.

15. The term is taken from Farkas & Bruce (2010).

16. In the case of a flipping-the-coin kind of bet, the first participant's bet determines a reduced set of available choices for the second participant, in the sense that if the first bettor bets on heads, the second participant must bet on tails. This, however, seems to be an idiosyncratic rule, not a linguistic one, and let alone a constitutive constraint on the speech act of betting. One reviewer pointed out that this might suggest that a more productive way to characterize bets would be to class them as games, and *not* as sui generis speech act. I leave the point for further research.

17. A simple example to illustrate: a mini-roulette that only contains three possibilities, say, Black, White and Red. One participant bets Black. A second participant bets White. No participant bets on Red. Turns out red. Now, participants wouldn't be surprised. They wouldn't say: "we didn't expect that one coming," "how queer," or "something went awry, let's do it again." This can only be explained by the fact that at the time their statements were made, the three possibilities were part of background assumptions and they *continued to be* after the bets were placed. This innocuousness shows that what was essentially added to the score, by the linguistic act of both bettors, was the record, not the content.

18. To clarify: a bet that points to a set of possibilities that were largely ignored, or not considered by participants, prior to the bettor's statement. Interestingly, and commenting on Stalnaker's idea of reductive effects on the set, Kölbel manifest the belief that the objective of a non-defective conversation is, less specifically, merely changing the set, which may involve widening it, "i.e. *adding possibilities* that had previously been discarded" (p. 50, note 2, my italics).

19. Cf. Brandom (1983: 649, note 12) on the idea of a *world assertor*.

20. Of course, one *can* supply a justification, or even adopt the practical principle of placing bets only when justified, but this is not a necessary condition for the communicative act of betting. Related to this same point, a reviewer has pointed out that one can bet on what one thinks (=predicts) about the future. I do not argue against this possibility. I am only making the point that this is not essential for the act of betting: I can bet on something I don't have the slightest idea how it will turn out, or even on something that I think it will *not* happen (say, for the sake of gaining a worthy profit, in case events turns as *nobody*

thinks will turn, *including me*). More generally, there seems to be a lack of justificatory mechanism in bets which seems constitutive of predictions, as the following contrasting conversations show:

C: ??

A: I predict that Huddersfield will defeat Chelsea.
B: Do you really think so?
A: No. Not really. But I predict so.

C: OK.

A: I bet that Huddersfield will defeat Chelsea.
B: Do you really think so?
A: No. Not really. But I am betting on it just in case I get a worthy award.

21. It is of great empirical interest which linguistic constructions can express, in virtue of their meaning, a neutral stance such as the one I aim to illustrate with this simple example. Needless to say: as there is relevant linguistic data to infer what types of expression count as assertions and what as challenges, there is every reason to think that concrete languages allow constructions that can count as expression of a neutral stance, and perhaps more specifically, as a neutral stance regarding future contingencies.

22. Note that, at least in some common cases, these replies would not have the same attitudinal effect for present and past assertions: "is that so?" commonly manifests doubt (or at least resistance to the incorporation of the content into the score); while "interesting…" concedes credit to the speaker (and accepts to incorporate the content). These observations are not meant as strict generalizations, though, and are subject to contextual factors. Further research is necessary to determine whether a dynamic approach is suitable for the analysis of linguistic constructions that (potentially) express acceptance, rejection and the neutral stance alluded in the previous note.

23. The reader may notice that, according to the table above, prospections come out as no different from assertions. This underspecification indicates that the defining element for taking the former as a subclass of the latter can only be captured in terms of tensed propositional content, as in the definition on p. 21. What is shown in the table, instead, are the distinctive elements between assertions and predictions, none of which involve temporal specifications. This is the driving factor to allow future assertions (=prospection) that are not predictions.

24. I am grateful to Martina Faller, Delia Bentley, Graham Stevens, and three anonymous reviewers for useful comments and discussion. This research has been supported by a CONICYT Chile grant.

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ON LANGUAGE AND THOUGHT: A QUESTION OF FORM

DAVID J. LOBINA
dj.lobina@gmail.com
LOGOS/Faculty of Philosophy,
University of Barcelona, Spain

ABSTRACT. The literature on the relationship between language and thought is immense, but it is not always clear what phenomenon exactly most publications are in fact examining – or whether the various studies are even compatible. This is mainly due to two interrelated reasons: the interested scholars seldom offer clear definitions for language and thought, and the terms of comparison between these two phenomena are hardly ever specified. The aim of this paper is twofold: a) to showcase the perils of this state of affairs by analyzing a particular but little considered type of mismatch between linguistic and conceptual representations, thus providing the primer for a competence-like analysis of thought, and in so doing b) defend a specific way to approach the language and thought nexus, prior to and above all others. In particular, I argue that the study of *the relationship* should give priority to a comparative analysis of the representational vehicles language and thought exhibit in order to work out what thought representations are actually like.

Keywords: language; thought; representational vehicle; level of explanation; question

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1. The Question Now Being Put

The question of how language and thought relate is possibly time immemorial, and the extant literature too large to review satisfactorily in a single paper. Such a description of the general state of affairs won't surprise anyone; what may raise a few eyebrows, perhaps, is the claim that large tracts of the modern literature are afflicted by two rather important problems. Firstly, scholars focused on this relationship are hardly ever clear as to what they take language and thought to be exactly, as definitions are rarely put forward; and complementing this, the very same scholars are usually rather vague regarding how language and thought are supposed to relate at all.

Myriad possibilities can be imagined in either respect, but identifying the different prospects necessitates significant exegetical effort and the rewards are to be found outside the language-and-thought literature. Natural language, to begin here, may be defined in many different ways: as a computational system of the mind, along with its connection to other mental systems (Chomsky, 2013); as a set of mental representations, perhaps in terms of *propositional attitudes* (Fodor, 1979, 2001a); as a purely communicative system, thereby closely connected to *mind reading* and *joint attention* abilities (Tomasello, 2003); as an exclusively real-time processing phenomenon (Frank, Bod, & Christiansen, 2012); as a symbolic system (Deacon, 1997); etc.

Whatever perspective one adopts, the particular choice will surely have a significant effect on what sort of issues are considered in the study of how language and thought are actually related. In fact, it is not an uncommon feature of the language-and-thought literature that the eventual terms of comparison employed in many a study are in fact the result of the conclusion to an argument on how to relate the two phenomena rather than a principled way to approach the problem at hand. Among the different possibilities, we find the following, *prima facie* incompatible options: linguistic (viz., syntactic) representations may be the actual vehicles of the main *medium of thought* humans employ (Hinzen, 2013); thought may be in fact impossible without language, this capacity necessitating the representation of the propositional attitudes, an ability some scholars have argued to be only achievable by employing language (Davidson, 1997, 2001; Millikan, 2001); language may connect different conceptual systems of the mind via the (syntactic) level of what used to be called *logical form*, these systems otherwise unconnected in the absence of a fully formed language faculty (Carruthers, 2002); the employment of language in speech (either inner or outer) may augment one's computational powers during explicit mental processes, language therefore at least enhancing (but probably not replacing) thought (see Clark's contribution in Carruthers & Boucher, 1998); natural language may be in fact inadequate as a system of thought, its main function being the *communication* of thoughts rather than its *representation*, thought therefore constituting a (perhaps slightly) different mental phenomenon altogether (Fodor, 1975, 2001b, among others); etc.

The result is that scholars are seemingly talking about very different phenomena when discussing the reputed relationship, from representational and architectural issues to processing phenomena. What's more, these scholars also differ in terms of how central they take language to be for thought, from those who defend that the most sophisticated forms of thought are conducted in natural language (Davidson, Carruthers), in some cases concluding that there is no *medium of thought* other than language, thus cutting the distinction very loose indeed (Hinzen), to those who believe that thought is instead conducted in a medium *other than* natural language, language and thought thus (again, perhaps slightly) different domains of the mind (Fodor).

It would certainly be a good thing to catalogue the different arguments (and data) to make sense of what they tell us about human thought *tout court*, but my objectives are focused elsewhere here. I am most interested in analyzing the *format* properties of linguistic and conceptual representations in order to work out whether language can be regarded as being constitutive of thought – to work out, that is, if language exhibits the right features to be regarded as the (main) medium of thought. To that end, I will analyze a specific type of mismatch between language and thought, and in so doing, provide the internal structure of a specific conceptual representation: the thought representation underlying an interestingly deviant English sentence. Naturally, it will be necessary to be rather clear as to what *language*, *thought*, and indeed *being a medium of thought* are supposed to mean in all this, and ample space shall be devoted to that in what follows. Assuming I have done all this right, I should have developed the following objectives: a) to argue in favor of both a certain way of defining language and thought and a certain way of relating them; b) to provide a primer as to what sort of structure, or shape, thought representations exhibit; and, c) to show that when one focuses on the deceptively simple question of figuring out what thought underlies a given sentence, a number of rather different issues unexpectedly surface, oftentimes pointing to different aspects of mental architecture.

I shall proceed in two stages. Firstly, I shall put together the machinery needed to relate language and thought; that is, I will define what I will take language and thought to be and I will claim that these two phenomena apparently involve slightly different mental systems. After that, I will propose a specific way to relate language and thought directly and I will exemplify the overall framework by discussing the aforementioned English sentence. According to this layout, the essay is thematically divided into two sections, neither more central than the other, but they certainly form a progression: the next section sets the stage for the second half. The essay ends by mentioning some additional linguistic data that further suggest that language and thought are indeed underlain by slightly different mental systems, and a reference is made to future work along these lines.

2. On Language and Thought

By a natural language I will here understand, following the line defended by the generative grammar enterprise in the last 60 or so years, a *state* of the faculty of language (FoL, in short), an architectural system of the mind composed of the following components: a combinatorial operation (recently termed *merge*); a set of lexical items (bundles of syntactic, phonological/morpho-phonemic, and, perhaps, semantic features); and two interfaces that connect the faculty with other systems of the mind, namely the sensorimotor (SM; roughly, the sound system) and the conceptual-intentional (C/I; even more roughly, the thought/meaning systems). The FoL is said to be in an *initial state* at birth, only to change during the language acquisition process in reaction to the input, ending in a *mature state*, the result of a

one-time selection of lexical items and how this particular selection interacts with a number of computational principles and interface conditions (see Chomsky, 2008, for a succinct description, and Yang, 2002, for how language acquisition might actually proceed).[1]

Thus, to know a natural language, say English, is to be in possession of a particular state of the FoL that more or less matches the mature FoL states of other English speakers. It is possibly the case that no two English speakers possess the exact same system of rules and representations (another way to refer to the *states* of the FoL), and the faculty clearly does not cease to change during one's lifetime – by mature we certainly do not mean *final*. Nevertheless, the description just given appropriately characterizes what is usually meant by the phrase "knowing a language," and that will suffice for the purposes of this paper (see, for some discussion and relevant references, Collins, 2008).

Such a conception, moreover, captures the fact that there are different aspects to language – syntactic, phonological, or at the interface with external systems – and whilst the full richness of language may require we look at the faculty in its entirety, many linguistic properties will be evident in some of its sub-systems. In fact, the different definitions of language advanced in the previous section – as a communicative system, as a set of propositional attitudes, etc. – implicate some of the sub-systems and not always necessarily the overall language faculty. In this sense, what we call Language, the overall linguistic capacity, may simply be the combination of its various components.

Language so described, what are the products of such a mental system? The language faculty generates a number of rather different sort of representations, two being the most central: one for the SM system, termed a PHONetic representation (a flat and linear object ready for externalisation, be in speech or any other modality), and one for the C/I systems, this one called SEMantic (a hierarchical object encompassing the containment relations inherent in a syntactic object; despite its name, a SEM representation is a syntactic object and thus it is not to be confused with the sort of representations semanticists postulate and work with; see footnote 2). These two representations are compiled from different sets of lexical features (morpho-phonemic features in one case, syntactic in the other), thereby yielding different types of representations and computations (or derivations, as linguists typically call them), the latter possibly the result of the different constraints the SM and C/I systems impose upon the underlying generative procedure. What are these constraints precisely? The very nature of the physical channel in which we communicate accounts for why the SM systems require a flat and linear representation for externalization (in either inner or outer speech, and in fact in other modalities too), whilst the C/I systems demand a structured object, given that syntactic structure goes a long way towards establishing the meaning and interpretation of a sentence (in addition, one would need to take into account the surrounding context, speakers intentions, and other such things, but I won't get into any of this here).[2]

In describing the language faculty in such manner, one is naturally pointing to the computational-representational paradigm so dominant in studies of the mind. According to this perspective, most of cognition involves computational processes over mental representations (or mental symbols), a view of the mind that linguists have actively elaborated, albeit in their own way. Indeed, the computations linguists have postulated are not meant to take place in real time, the focus of much of cognitive science; rather, linguistic derivations constitute abstract specifications of the principles and constraints underlying linguistic structure. The linguist's is a study of *competence*, whereas most of cognitive science presumably focuses on the actual processing mechanisms operative in behavior, the study of *performance* (these terms, as is well known, were introduced by Chomsky, 1965, but I will employ them somewhat differently here; Chomsky himself has moved on from the particular description given in his 1965 book). Fodor (1983), a foundational work of the computational and representational theories of mind, is a study of some of the processing mechanisms the mind employs in behavior, and has little to say about architectural/representational systems such as the language faculty (the relevant interconnections notwithstanding) and many a textbook in cognitive science paint a similar picture (e.g., Gallistel & King, 2009).

The distinction between abstract computations and real-time processes can be found in the formal sciences as well (viz., in mathematical logic and computer science); it is not an exotic curiosity of cognitive science. The computations the language faculty is said to effect are closer in nature to a logical proof, or to what some mathematicians call a *theory of the computation* (McCarthy, 1963), an "abstract formulation of *what* is being computed and *why*" (Marr, 1977: 37), to quote a scholar who was greatly influenced by the formal sciences (much like Chomsky, in fact; see Tomalin, 2006, and Lobina, 2017, for some details). Such a perspective would appear to fit well with the study of linguistic competence, with its focus on *what* language qua systematic body of knowledge is like, a study that is conducted in generative (i.e., computational) terms in order to capture language's open-ended nature. The processes that engage most of cognitive science are instead closer to what computer scientists call *models of computations* (Moschovakis, 2001), step-by-step computations that typically proceed in real time, as when a particular process is executed. As I shall explain below, I will keep to the more abstract computational theory to connect language and thought, even if some processing/behavioral factors will have to be discussed too.

The notion of a representation is also treated inconsistently among the disciplines encompassing cognitive science; in particular, this term means something rather different to a philosopher than it does to a linguist. For the former, a mental representation depicts an aspect of the world, and thus it must be veridical and accurate if it is to play a role in thinking – indeed, if it is be considered a mental reality at all. Linguists, however, treat representations as nothing more than internal data structures that play specific roles within linguistic derivations. A linguistic representation is simply either the input or the output of a linguistic operation and

they are composed of lexical features that cannot be analyzed relationally to externalia (Collins, 2004). Indeed, the lexical features, or combinations thereof, that linguistic derivations manipulate cannot be said to represent any external reality; there is no *wh* anything out there, to point to the ubiquitous *wh*-feature of linguists; thus, there can be no question as to a lexical feature's accuracy or veridicality. In this case too, I shall adopt the linguist's usage when talking of representations, but the actual points to be discussed will be very central to the philosopher.

Representational and computational theories of mind have much going on in their favor. It has been a cornerstone of cognitive science that human behavior is to be explained in terms of the internal representations that mediate between environmental stimuli and behavioral responses (including how these internal representations combine with each other), a sort of mentalism that is meant to account for the degree of freedom there often is between stimuli and responses (Fodor, 1975: 157; Laurence and Margolis, 1997: 65). According to this reasoning, the key to explaining human cognition lies on the internal properties of the mind's medium of computation and not on the stimulus-response pairs themselves, the units of explanation that once-upon-a-time behaviorism would have us focused on. Crucially, this sort of story provides the appropriate basis for a definition of thought (and thinking); and in turn for relating language and thought.

I wouldn't want to suggest, however, that all of cognition can be explained in these terms. In particular, I am conscious of Fodor's argument, which I take to go some way, that if a system of the mind is not modular, then it is very likely that we will not be able to scientifically study it at all (Fodor, 1983). This is especially true for what I take the *activity* of thought to be about primarily – namely, the fixation of belief that constantly goes on in mental life – the very process Fodor has argued to be non-modular and non-computational (Fodor, 2000). That may be so; my interest, however, does not lie on the *activity* of thinking per se (a study of *performance*, effectively), which is what I take Fodor to have been talking about anyway, but on the sort of representations that support thinking (in a way, a *competence* matter). That is, I'm interested in the sort of *format* and *form* that thought representations must have in order to support the fixation of belief. Thus, I'm proposing to characterize *thought* in terms of its representational vehicles along with the contents these vehicles typify, this in itself a line Fodor has argued for extensively. The famed relationship, therefore, will be here framed in terms of the types of representations language and thought exhibit, and thus the focus will fall upon the format, or shape, of mental representations (the actual details will be provided in the next section).

Thought, then, is to be regarded as being closely connected to what philosophers usually call content, or a proposition, the kind of objects over which propositional attitudes range, and the objects of beliefs themselves. To have a thought, according to this view, is to entertain a proposition (or a group of propositions), while to think is to combine propositions in various ways, from embeddings and combinations of various kinds (via connectives, for instance) to the premises-and-conclusion organi-

zation typical of reasoned thought. To this end, a proposition must be fully explicit and complete, bear truth values, and (to my mind) exhibit a constituent structure (viz., a predicate with its arguments).[3]

A proposition's predicate-argument structure will be the crucial issue here; consider the following two examples in order to clarify (the first typical of introductions to formal logic, the second due to Steinthal, as quoted in Seuren, 2009).

(1) Caesar invaded Gaul.
(2) Coffee grows in Africa.

From the point of view of what proposition underlies (1), the sentence ascribes the property *having been invaded to Gaul*, and thus the predicate would be *having invaded* (or something like that), with *Cesar* and *Gaul* as the arguments – in schematic form: < having invaded < caesar, gaul >> (I use angle brackets to represent propositions and Polish notation to mark the predication). It is quite immaterial how this fact is grammatically expressed (in the active or passive voice, with a cleft construction, etc.), as the state of affairs would be the same in every case: the proposition *Caesar's invasion of Gaul*. Following Seuren (2009), but paraphrasing a bit, a proposition is the act of ascribing a property to a mental representation. Regarding (2), and again, from the point of view of the underlying proposition, we find the property of *being in Africa*, the predicate, being ascribed to the argument *the growing of coffee*. This certainly contrasts with the sentence's syntactic structure, where *coffee* would be the subject of the sentence and *grows in Africa* the predicate along with its argument. Instead, the structure of the proposition would have to be something like this: < being in Africa < the growing of coffee >>. Thus, predicates and their arguments (or subjects) would apply rather differently in each domain.[4]

A rather apposite way to highlight the mismatch is in terms of the two-layered structural analysis described in Seuren (2009). According to Seuren, sentences exhibit two layers of structure, corresponding, I add, to two different types of analysis. The analysis of the first layer would be focused on outlining the grammatical subject-predicate structure of a sentence, whilst the analysis of the second layer would instead identify the *logic-like* subject-predicate structure of the underlying proposition. The first analysis would be presumably syntactic in nature and the second more conceptual and thus logic-like; a sort of progression from a sentence's syntactic structure to the corresponding (logical) structure in thought. We would have to add a semantic level to this picture in order to mediate between the two layers, especially for the purposes of this paper. Indeed, it is customary in semantics to run meaning composition off the syntactic structure of sentences, and I submit that the information yielded at this particular juncture – the syntax-semantics interface – ought to be particularly useful in order to characterize conceptual representations properly. What I am suggesting is that differences in meaning point to specific differences in conceptual representations, and this is precisely the theoretical space I am keen to explore here, which I shall approach by paying particular

attention to the different structural relations each domain exhibits – syntax and semantics, on the one hand, the conceptual and logic-like on the other (the study of pragmatics is also relevant, and I will say something about it later on).[5]

Accordingly, the example in (2) suggests that the theoretical modeling required to account for thought representations seems to be quite different from the model that is required to account for linguistic representations – or more accurately, that the structure you have to postulate in one case is rather different from the structure you postulate in the other. One could use a different notation to describe thought representations, but the difference in structure would have to be accounted for either way. Note, also, that the fact that in (1) there is a post-verbal noun phrase complement and in (2) a post-verbal prepositional phrase adjunct is quite immaterial to the point I am making – different grammatical structures for different thought representations does not establish a constitutive relationship between language and thought, given that thought representations are such regardless of much grammatical detail.

Crucially, these two examples point to some of the mismatches between linguistic and, what I take to be, conceptual representations, with the internal structure of propositions qua mental representations constituting the key issue here. Propositional constituents must allow for the flexibility and creativity involved in belief fixation, this flexibility no more evident than in the very common phenomenon in which different types of perceptual inputs can be combined with each other and with pre-existent beliefs during the construction of a thought. An explanation for cognitive flexibility may be approached by taking thought constituents to be what some philosophers and psychologists call concepts, the mental particulars that underlie propositions (Fodor, 1998). Concepts are abstract thus amodal, but also pretty stable and as a result re-usable, two general properties that ought to allow for the combination of mental representations of various kinds into ever more complex representations of a general type.[6]

The sort of mental reality I envision for propositions and concepts is a steady and permanent one; namely, they must constitute some sort of structure in long-term memory, a *type* of mental representation rather than a *token*, even though these representations would certainly be causally tokened in mental processes, belief fixation being the most general case. In this sense, by the phrase mental particular I do not mean *particular* tokenings of concepts, but simply the much more general fact that the concept SAINT, for instance, is a different mental particular to the concept SAGE. Naturally enough, these concepts can be combined into more complex mental representations, such as THE ISLAND OF SAGES AND SAINTS, but the *particular* tokening of the complex concept THE ISLAND OF SAGES AND SAINTS would remain distinct from the mental particular of the corresponding concept *type*.[7] I also do not mean to suggest that all possible concepts and propositions are stored in long-term memory, even though many of them would certainly be; all we need here is a set of concepts and some sort of combinatory/compositional system that creates complex concepts out of primitive concepts, much as is the case

in linguistic cognition. Thus, conceptual structure is a bit like natural language – thought has a syntactic structure and a compositional semantics – and it is for this very reason that the question of whether natural language can be regarded as the main medium of thought arises at all. Also, it will have been noticed that the overall picture is very similar to Fodor's (1975) *language of thought* story (LoT, *postea*), and I shall indeed keep referring to the LoT in what follows, at least in the narrower sense of it being a conceptual, representational system of some kind. So what sort of structure must thought representations exhibit?

Consider Gareth Evans's Generality Constraint, according to which thoughts must be structured (Evans, 1982: 100), not in terms of their internal elements, something Evans in fact rejects, but in terms of "their being a complex of the exercise of several distinct conceptual *abilities*" (101; his emphasis). Evans is here drawing attention to the apparent fact that if one can entertain a thought in which a given property, call it *F*, can be ascribed to one individual, *a*, this is the result of two abilities: understanding *F*, understanding *a*, and applying the predicate *F* to the argument *a*. Consequently, if one also understands property *G* and individual *b* – that is, one understands the two sentences/thoughts, *Fa* and *Gb* – then there are "no conceptual barriers" (101) to entertain the sentences/thoughts *Fb* and *Ga*.

Ultimately, this is an ability "to think of an object in a series of indefinitely many thoughts" (104). The Generality Constraint is related to, but is not quite the same as, what Fodor has come to call the systematicity of thought (Fodor, 1987), the claim that our ability to entertain some thoughts is intrinsically connected to our ability to entertain similar thoughts (Fodor & Pylyshyn, 1988). According to Fodor and McLaughlin (1990), this property is a reflection of constituent structure, given that the stated similarity amongst thoughts is a matter of the form these thoughts have, their internal structure (this is precisely the aspect of systematicity Evans would not have accepted). Thus, if one can entertain the thought that $P \rightarrow (Q \rightarrow R)$, one should also *ipso facto* be able to entertain the thought that $(P \rightarrow Q) \rightarrow R$; clustered thoughts, as it were (McLaughlin, 2009: 253).[8]

From Evans's structured cognitive abilities to Fodor's structured propositions, but what does *all this* yield exactly? The above description provides the desiderata that a medium of thought must meet; namely, a *language of thought* must be able to: a) appropriately represent the contents of thoughts; b) accurately distinguish the contents of different thoughts; c) faithfully represent the propositional attitudes; and d) play a causal role in mental processes.[9] Critically, these four requirements can provide the yardstick against which linguistic representations can be measured as a potential medium of thought, and in various ways. Indeed, the first three desiderata are related to matters of competence, whereas the last one involves the study of performance, and as I shall show in the next section, what one says about language-and-thought at the level of competence may well be very different from what one says about it at the level of performance.

The analyses I shall provide in the following section ought to bring this point home, but before sallying forth, it is important to note that the conception of thought

I have put together is based on a logic-like notion of what thought must be like, as discussed in reference to the sentences in (1–2). That is, I have offered a characterization of thought that is meant to be independent from what we know about language. After all, I have intimated that the most central issue of thought representations is predication – i.e., the ascription of a property to a mental object (a concept or mental representation) – and this property is certainly independent of much grammatical detail. This is rather important, for at the very least shows that it is possible to characterize thought independently of language, allowing us to then evaluate whether natural language can be regarded as *the* language of thought – an empirical issue, surely.[10]

I now turn to outlining how language and thought are to be connected in order to approach this question. I will analyze a deviant English sentence and focus on the first two desiderata I have listed (content representation and differentiation), the overall discussion framed in terms of representations and computations as the linguist understands these notions. As will be increasingly clear, I will eventually come to frame *the relationship* in terms of how the *language of thought* (LoT) and the *faculty of language* (FoL) interrelate qua architectural systems of the mind, but some other factors will have to be clarified along the way, as announced at the beginning.

3. On Relating Language and Thought

According to the two conceptions of a computation outlined in the previous section, there are at first sight two main ways in which to relate language and thought: at the level of competence and at the level of performance. Much as has been the case in linguistics, I will argue that the first of these can be regarded as taking precedence over the other, and I shall present them in this very order below (complicating things somewhat, the two perspectives point to yet other ways of relating language and thought, as I will show).

This more primordial way involves what Pylyshyn (1984) calls the symbolic (or syntactic) level, a level of description of cognition that mandates focusing on two interconnected issues: a) the shape, or form, of mental representations, thereby abstracting away from such questions as intentionality or truth, quintessential philosophical issues to be studied at the semantic level, as Pylyshyn calls that other plane of cognitive studies; and b) the (formal) properties that specify how symbolic primitives combine into more complex mental representations (the rules of composition, say). At Pylyshyn's syntactic level, then, the only features that matter are the abstract and formal properties of computations and representations.

Pylyshyn's syntactic level accords well with what generative linguists themselves claim to be studying; Chomsky (1986) explicitly states that it is precisely at Pylyshyn's symbolic level that the linguist proposes "a system of rules, representations, and computations" (262), the perspective that Chomsky called competence and which locates the language faculty within what Pylyshyn (1984) denominates

the "functional (or cognitive) architecture" of the mind, the conglomerate of the most basic and primitive systems of cognition. As stated in the previous section, the FoL may simply be a specific complex of some of the invariant components of mental architecture, one that would not include memory systems, the parser, and other components (these being part of a study of performance), but lexical features, *merge*, and the interfaces instead. Given the centrality of both language and thought in human cognition, it is precisely at the level of the cognitive architecture where language and thought would relate to begin with, and that shall be my remit here – an FoL-LoT interrelation. Adopting this perspective allow us to study the way language relates to other systems of the mind, including those subsuming thought, from the point of view of whether these other cognitive systems share the exact same components as language, a subset of these, or instead none at all.

The language-and-thought literature has so far neglected this viewpoint, and yet it would seem to be the principal way to relate the two phenomena. Every product of cognition is the result of how the internal mental machinery functions, and it would be just natural to focus on such machinery as our object of study. Further, focusing on mental architecture is a fairly straightforward strategy to follow: figure out what sort of mental structure supports language and then compare it to the sort of mental structure that supports thought. If they are not more or less the same, then we are likely to be talking about different mental phenomena. Naturally, the requisite mental structures cannot be directly observed in the brain and cognitive psychology certainly does not provide a clear picture (see Lobina & García-Albea, 2017, for some examples), but we could do worse than to concentrate on the outputs of each phenomenon – i.e., the representations language and thought generate – in order to tease out what type of mental structure supports each.

The focus will fall on the shape of the representations supporting language and thought as well as on the computational theories that bring about such representations. To conduct, that is, a competence-like analysis of language-and-thought as a way to unearth the relevant parts of mental architecture. To this end, I shall understand the locution *being a medium of thought* to refer to the mental code (representational vehicle) required for belief fixation, its study a question of working out what sort of format this internal code has, and not an investigation of the real-time processes at play during the activity of belief fixation. From this perspective, then, in studying the language-and-thought nexus one would want to determine, first of all, what sort of representations thought subsumes in order to then move on to an evaluation of whether language exhibits the appropriate features – the latter being the *sine qua non* condition on natural language being *the* language of thought.

The second main way to relate the LoT and the FoL is at the level of what Chomsky calls performance, which for our purposes is the level of explanation that concerns the real-time processes that a good part of cognitive science, and certainly most of cognitive psychology, focus on. This is a level of analysis that goes beyond the mental components outlined for a competence-like study, a peculiarity that is

true for both language and thought. Language behavior, including comprehension and production, would plausibly involve, *inter alia*, the FoL (at the very least as a knowledge base specifying what sort of representations are licit), a parser that chunks the input into constituents of various kinds (for language comprehension), a formulator that puts together the words and phrases to be outputted (for language production), and whatever perceptual and other cognitive systems participate in either process (such as attention and memory resources, the pragmatic component, joint attention, etc.). The act of thinking, on the other hand, would engage mental processes such as categorization and reasoning – but more generally belief fixation – and mental states such as propositions and propositional attitudes, an overall (mental) activity that is obviously also a real-time phenomenon and thus would also make use of memory, attention, etc.

Importantly, it is only when the different elements underlying competence and performance are laid out that it is possible to evaluate the supporting mental architecture for each phenomenon (the strategy I have defended we should follow). That is, if language and thought are studied at the level of competence, then the investigation will implicate a very different mental reality from what one might expect in a study of performance – *a fortiori*, rather different cognitive theories stemming from different methodologies would be constructed at each level. It seems to me, in fact, that most of the literature on the relationship between language and thought centers on the level of performance, as evidenced by the numerous accounts on offer on how language influences thought during actual behavior (or real-time processing), some of which were referenced earlier on. That this is so muddies the issues at hand a great deal, for many a datum from performance may not bear a transparent relationship to architectural/representational properties (see *infra* in relation to spatial reorientation data).

More importantly, the question of how language and thought relate at the level of competence must take precedence over how they interact during actual behavior. We need to first resolve the question of whether language really is constitutive of thought – that is, whether the mental representations thought uses are provided by the language faculty – before considering how language is employed during actual bouts of thinking, as the behavioral data will look very different depending on how this prior question is answered. This general point applies to the architectural perspective as well as to some of the other ways in which language and thought can relate, such as the general effect acquiring a language has on thought and cognition, the physical representation and implementation of language and thought in the brain, or the evolution of language and thought. Much as is the case with the level of performance, I would argue that these other ways of relating language and thought are also dependent on the results of a competence-like study of *the relationship*.

In order to bring this point home, I now finally turn to analyzing a type of mismatch between linguistic and conceptual representations that has received little attention. I aim to accomplish two things with this analysis: a) highlight that it is imperative to employ appropriate definitions for language and thought, and appro-

priate ways to relate these two phenomena; and b) (re-)establish the position that language and thought *do* constitute different phenomena, against the recent efforts of Hinzen, Carruthers, & Pietroski to conclude otherwise (we would have to add Chomsky to this bunch, at least in some of his recent moods).

Let us discuss the sentence in (3) below, which was once employed by a journalist to describe a particular event in the British Parliament:[11]

(3) Pete Wishart, the SNP MP, says he wants to put the question that the question not be put be now be put.

This sentence, a convoluted example no doubt, but somewhat typical of British political discourse, may pose great difficulty upon first encounter, and probably because of its repetitive nature: one too many *question*, clearly too many *bes* and *puts*. An account for what the sentence means (and what thought it expresses) can be sought both at the level of competence and at the level of performance, and each will yield a different sort of explanation (or set of concerns). The importance of this particular example, however, rests on the mismatch it highlights between the way things need to be phrased in Parliament and the corresponding thoughts speakers intend to communicate under and, as we shall see, beyond such constraints. The mismatch, moreover, provides some criteria as to what a competence theory of thought will look like vis-à-vis a fully developed competence theory of language, and that is precisely what I am after in this paper (at least in the form of a primer).

Let us consider the level of performance first; this is not an unnatural place to start from, considering that most people are first exposed to such sentences in settings that involve some sort of behavior (e.g., during a verbal exchange, listening to a parliamentary debate or, indeed, reading a philosophy paper). I'll then move on to the question of what thought underlies the sentence, at which point I shall argue that there is a rather interesting mismatch between the sentence's linguistic structure and the structure of the corresponding thought. Such a take on things will give me the opportunity to provide a competence-like analysis of the underlying thought representation, and I will end the discussion of this sentence by offering a few remarks regarding the first two representational desiderata established earlier on for a *language of thought*.

From the perspective of language comprehension, upon reading or hearing a sentence the linguistic parser is receiving one element after another in a linear fashion, and as it does so builds a syntactic structure for the sentence, which may or may not be the actual structure intended by the speaker/writer. At the same time (or rather, concurrently to that), the overall comprehension system is attempting to assign a meaning to the sentence – that is, building a semantic representation – and does so at every opportunity it has (say, after every word or phrase); much as in the case of syntactic processing, and very commonly because of the operations of it, this interpretation may not be the intended one.

Keeping to the syntactic side of things, the parser operates in an incremental fashion, both building a hierarchical structure *and* predicting the next type of

linguistic item to be parsed at each stage of the comprehension process. Thus, upon having processed, say, a noun, the processor would both build up a noun phrase structure for it and predict/expect, typically, a verb phrase to come next, the sentence's predicate for the sentence's subject (all this *ceteris paribus*, of course). In the case at hand, the parser would process *Pete Wishart* as the subject of the sentence and *says* as the main verb, and then predict/expect a direct object argument. The parser is instead inputted the pronoun *he* after *says*, indicating an internal, embedded clause, forcing the parser to re-evaluate its operations. The pronoun is followed by a verb, in this case an infinitival construction, *wants to*, another verb, *put*, and finally a direct object, the *question*. So far, so straightforward for the parser, but what follows introduces another internal phrase (this time marked by the complementiser *that*) and much repetition: another *question*, three *bes*, and two *puts*, the whole eventuality possibly driving the parser into a bottleneck.

There is, of course, more to language comprehension than the operations of the parser, as the overall system can access and make use of a number of different sources of information to process a sentence, sometimes to the rescue of the parser. Central amongst these is prosodic information, as it provides information on the sentence's syntactic structure, but how do the syntactic and prosodic phrases of the sentence in (3) match up? It may take a couple of passes before the reader is able to link the right syntactic structure to the right prosodic structure – one of the crucial steps to understand the sentence in – but once this is done, computing the sentence's intended syntactic structure should pose no great effort, even if the actual meaning could still be elusive (as we shall see). That is, if one were to utter the sentence in (3), and did so correctly – that is, with the right intonation – that would prove to be a very strong cue for a hearer, allowing them to work out the underlying syntactic structure with not too much difficulty.

As it happens, working out the right prosody and the corresponding syntactic structure required quizzing the SNP MP, but he complied. At first sight, the Wishart sentence can be understood in one of two ways. According to the first possibility, Wishart has a particular question in mind, namely *the question that the question not be put*, and with that question in mind, he then moves that this question be now be put (whatever this means; I will come to this soon enough). According to the second possibility, Wishart has a different question in mind, namely *the question that the question not be put be now be put*, and with that question in mind he then moves this question (again, and for the time being, whatever this means exactly). So which one is the right interpretation?

(4) below uses the | symbol to mark where the prosodic phrases would roughly end, according to the reputed MP, with (5) showing the sentence's simplified and lightly annotated syntactic structure. The syntactic structure in (5) establishes that the string *that the question not be put* is a relative clause (RC) modifying the previous noun phrase (NP) *the question*, and that after this internal clause there is a verbal phrase (VP) followed by what looks like another verbal phrase. According

to the prosodic and syntactic structures in (4–5), then, Wishart had the first meaning in mind when uttering (3).

(4) Pete Wishart says he wants to put the question | that the question not be put | be now | be put.
(5) Pete Wishart says he wants to put [NP the question [RC that the question not be put]] [VP be now [VP? be put]].

I expect that this will not have helped matters all that much, though. Indeed, the prosodic and syntactic structures may be well matched-up now, but the sentence would still be rejected as meaningless or incomprehensible, and not only because its repetitive nature may prove to be too great a burden. That is, the sentence may be regarded as being well-formed once the intended structure has been ascertained (maybe), but remain meaningless nonetheless. Further parses and some concentrated reflection upon what the sentence is trying to convey could help, but proper comprehension necessitates knowledge of what some of the sentence's units actually mean (or stand for). Pronouncing and perceiving the sentence correctly does not settle the issue; what we need to do is pronounce and perceive the sentence with the right *competence*.

A rather central factor here is the idiomatic or formulaic nature of British parliamentary discourse. As it happens, the phrase *that the question be now put* is usually employed in Parliament to request a "closure motion," that is, a closing of the debate at hand so that the question under consideration can *be put* to a vote. Thus, in order to know what the sentence means one would have to be privy of this knowledge; one would have to be acquainted with this particular idiom. What the sentence amounts to, then, is a situation in which there is at present a question under discussion that is not currently being considered for a vote (i.e., the question not put, or in parliamentary terms, the question not be put) and Mr Wishart wants to put this very question to a vote (viz., that the question now be put, or in Wishart's terms, that the question be now be put). The linguistic processor can't patently return the meaning of the sentence if the parliamentary idiom isn't part of one's linguistic knowledge.

Interestingly, Wishart seems to have gone beyond the parliamentary formula, creating his own idiom in (4–5). In particular, Wishart is playing with the standard wording a little bit and appears to have taken the phrase *be put* to be sort of detachable from the whole, *that the question be now put* expression. That is, he is closing the motion in a slightly different way; namely, in putting the question to a vote, Wishart takes it that one might want to request that the question *be put* to a vote. Accordingly, the *be put* within the *that the question be now put* would be part of Wishart's own idiom in addition to being the subjunctive verbal form within the more conventional parliamentary idiom. This would explain the presence of what seems to be an extra *be* (and thus an extra VP), the second last in (4). Indeed, the sentence sounds much better without this extra *be*, as shown in (6) below, and I

gather that most people would consider the sentence unquestionably grammatical in this case.[12]

(6) Pete Wishart says he wants to put the question [that the question not be put [now [be put]]].
(7) *? Pete Wishart says he wants to put the question [that the question not be put [now [be [be put]]]].

In the original example, then, Wishart seems to have thought that, in addition to the subjunctive *be*, which the sentence must obviously have, the sentence must also exhibit a *be put* as a unit, given that, for Wishart at least, in order to close a motion in parliament one must *be putting* the question to do so. If so, the word *be* appears in two different guises at the end of (3): as part of a common parliamentary expression – the original idiom – and as a subjunctive. Thus, Wishart could have conceivably uttered (7) instead, considering that the adverb *now* can appear on either side of the subjunctive. Needless to say, it would be very hard to convince anyone that the latter version ought to be regarded as grammatical too.[13]

The extra *be* is key to the point I aim to make here, but we need to consider the question of how the productivity of natural language syntax relates to the productivity of thought in order to show why. In particular, we need to evaluate whether the match between the productivity of language and the productivity of thought is one-to-one. The productivity of each domain has been stressed before in the literature (and in this very paper), and so has the point that they must be somehow related. Searle (1969), for instance, has argued in favor of a *principle of expressibility*, according to which whatever can be meant (thought, in my terms) can be said (16), a principle that is closely related to what Katz (1978) has called *effability*, namely, the inter-translatibility of whatever content one might be able entertain (in a conceptual system, in my imitable terms). I think that both principles, properly hinged, must be true, but we must nonetheless allow for greater flexibility at the "what can be said" side of the relationship. After all, there are many different ways in which one may wish to linguistically communicate the very same content, and these different ways are not always the result of conceptual differences.

In fact, the match between linguistic and conceptual representations is very unlikely to ever be, strictly speaking, one-to-one. This is clearest in the case of (3), where the idiomatic nature of the sentence results in the matching-up of rather disparate units. After all, an idiom involves, by definition, a match between a constructed syntactic structure and an unequivocal meaning (or conceptual representation). More importantly, a closer look at the internal structure of the sentence in (3) will show how transparent the relationship between language and thought is in this case.

The field of generative grammar is particularly useful in this respect, with its focus on the hierarchical relations among different lexical items within a sentence and how these are formed (or derived). As explained earlier, a generative grammar employs a combinatorial operation (i.e., *merge*) that manipulates the syntactic

features of lexical items in order to generate representations that interact with the sound and meaning/thought systems, and it does so in stages, or *phases* (these are points in a derivation where specific sets of operations are completed and the resultant representations are closed off from further manipulation). According to this theoretical perspective, *merge* takes two lexical items at each time and combines them into a unit, starting the overall derivation with what looks like the most embedded material. In the case of (3), repeated once again below, *merge* would presumably start by taking the final *be* and *put* and form the unit *be put* (as we shall see, this is not quite what happens, though).

(8) Pete Wishart, the SNP MP, says he wants to put the question *that the question not be put be now be put*.

I will not quite run the entire derivation of the sentence; some steps will only be described and I will also omit the very first step I have just mentioned and simply assume that *be put* is a single unit throughout (I do this to ease the exposition). We need to concentrate on the derivation of *that the question not be put be now be put*, the *content* that needs to be accounted for, and thus I will ignore the rest of the sentence (note that I have highlighted this content in (8)). The sentence actually exhibits an internal, embedded clause, and this results in a rather intricate derivation, which may create some confusion. (9) outlines such a derivation, which I shall describe in some detail.[14]

(9) (1) [be put] [the question]
(2) [not] [be put the question]
(3) [the question]i [not be put ____i]
(4) [be put] [[the question]i not be put ____i]
(5) [now] [be put [the question]i not be put ____i]
(6) [(be)] [now be put [the question]i not be put ____i]
(7) [[[the question]i not be put] j ____i] [(be) now be put ____j]

The derivation outlines the formal properties of the sentence and manifests a number of peculiarities. One of these is that the initial stages of a derivation involve the argument structure of the overall sentence. Thus, instead than generating a sentence from left to right, as linguistic production and comprehension would presumably mandate, modern generative grammar proceeds from the bottom upwards. The argument structure of the fragment I am analyzing is composed of the predicate *(be) now be put* and the argument *the question not be put*, and thus we start with the derivation of the latter, a complex syntactic structure in its own right. Steps 1–3 outline the derivation of *the question not be put*; an argument structure itself, the derivation starts by combining the predicate *be put* and its argument *the question* side by side (step 1), the negation is then introduced in step 2, and the phrase the question moves in step 3 to its final position (a case of displacement, in this case fronting). The underlining and the subscripts mark the relevant co-dependencies

between the starting position of the question and the position where it moves to; an old-fashioned, and not entirely correct, way of marking the movement operation, but let it stand for now. The phrase *the question* is introduced adjacent to *be put* in step 1 in order to receive thematic interpretation from the predicate (be theta-marked, that is) and so that when *not* is introduced in step 2 the negation takes scope over the whole *be put the question*, accounting for the sentence's syntactic and semantic facts. Steps 4–6 show the introduction of the sentence's main predicate (along with the theta-marking) and in step 7 the whole phrase *the question not be put* moves from its original position vis-à-vis *(be) now be put* to its final position, where it is in fact pronounced (note the new underlining and subscripts, and the fact that the scope of the negation remains within the internal, embedded phrase).

The one major peculiarity in all this for our purposes is the derivation of Wishart's own idiomatic creation, as shown in the presence of the extra *be* in step 6 (thus also introducing an extra VP, as mentioned), which the parliamentary idiom would not have (it would have been noticed that I have marked this contrast with a parenthesis throughout). The result is the self-contained unit that is put together in steps 4–6: *be now be put*. Naturally, both the *be now* and the *be put* refer to *the question not be put*, even if this is not entirely clear in Wishart's formulation, this partly on account of Wishart's apparent word play, where *be put* is taken to be detachable from the whole idiom, as stressed earlier. Significantly, even if we were to regard Wishart's sentence as ungrammatical, its derivation actually employs the same sort of operations and constraints than the grammatical, parliamentary version would – all that is needed in this case is the dispensation of an extra *be* along with the corresponding steps in the derivation.[15]

Be that as the syntactic facts may be, in simple terms the meaning of the sentence is that there is a question that has not been put to a vote and Wishart wants to now put it to a vote (as noted, I'm ignoring the rest of the sentence, including the indirect speech verb says and the propositional attitude verb wants, but this matters not). In parliamentary terms, that there is *a question not be put* and that someone wants to have it *now be put*. Or, in Wishart's terms, that the question *be now be put*. So what does this all mean for the conceptual representation underlying the sentence?

The differences in meaning, which point to the relevant conceptual differences, as argued earlier, are really key to understanding how the linguistic and conceptual representations match up. The phrase *be put* is understood to be short for "put something to a vote"; or better, it means something like "to ask people to vote on a proposal." Thus, we can take PUT THE QUESTION TO A VOTE as the relevant conceptual representation here (I will revert to using angle brackets for the underlying predicate-argument proposition), with *the question be put* a paraphrase in parliamentary language. Thus, moreover, *the question not be put* would have to be translated into conceptual representation as something like THERE IS NO VOTE ON THE QUESTION, and both the standard *now be put* and the non-standard *be now be put* as PUT THE (UNCONSIDERED) QUESTION TO A VOTE NOW (or

something like that). I'm playing fast and loose with the conceptual representations – how could it be otherwise? – but I think the point I'm trying to make is clear enough: there is some distance between how you put things in language – parliamentary or not, in Wishartian terms or not – and how this is in fact represented in conceptual terms.

More to *the point*, the content-bearing segment I am analyzing – *that the question not be put (be) now be put* – reveals two specific predications in the conceptual representation (again, I'm ignoring the rest of the sentence). The first relates to the question not being put to a vote – an unconsidered question, that is. This is the first internal structure the conceptual system must put together: the predication of < not being considered > to the argument < the question >. That is, the proposition < not being considered << the question >> (or simply *Fa*, say). This particular thought representation would interface with steps 1–2 in the linguistic derivation, as current generative theory dictates. However, and rather crucially, the conceptual representation would not interact with step 3, as the representation that obtains at such step plays no role in accounting for the requisite conceptual differences – that is, it has no analogue in thought. It would seem that the derivation in step 3 would be the result of some internal, linguistic requirement, and it is hard to see what need there might be for movement operations in thought at all. Displacement seems to have an exclusively linguistic function.

What function in particular is an interesting topic in itself, and I am but alluding to a rather contentious issue, actually; namely, whether movement phenomena are due to either the C/I interface or the SM interface. If movement operations were the result of the SM interface, my position would be strengthened, and this is the position defended in Moro (2000), in fact. I am more or less non-committal about this, though. My intention is simply to highlight the mismatch between linguistic representations (and operations) and the corresponding conceptual ones, as stressed throughout.[16]

After the initial predication, the conceptual system would have to construct a predication of the so-far constructed representation; namely, it would have to assign the predicate < being put to a vote > to the proposition < not being considered << the question >>, resulting in, simplifying somewhat, the conceptual representation < being put to a vote << unconsidered question >> (or simply *P(Fa)*). Again, the generation of this particular conceptual representation would interface with the steps 4–6 in the linguistic derivation (more about this soon enough), but not with step 7, where there is further movement. In any case, the derivation (or competence-like theory) of the conceptual representation would be, mostly, a two-stage affair, as shown below.

(10) (1) predicating < not being considered > of < the question >
(2) predicating < being put to a vote > of < not being considered << the question >>

So how does all this bode for the relationship between the linguistic and conceptual representations underlying (3)? A number of factors are worth discussing. First of all, even though I am using a similar vocabulary to the sentence's actual words to describe the conceptual representations (being put to a vote, the question, etc.), I very much doubt that the requisite concepts are all that similar to the relevant lexical items. That is, these concepts are likely to be very different indeed, and it is worth noting that I have had no need to employ so many *bes* and *be puts* in the conceptual representations and the corresponding derivations. Nevertheless, the employment of the copula *to be* plus a predicate is rather close to the conceptual facts, and that suffices for my purposes (recall the predicate-argument(s) structures provided in (1)–(2)).

In any case, the differences in vocabulary point to the different types of atoms at play in conceptual representations, above and beyond the fact that we are dealing with an idiom, as reflected in the rather different derivations I have proposed for each domain – different competence analyses, that is (cf. Higginbotham (1998) on what he calls conceptual competence, which is close to what I have in mind here). The two representations must obviously connect at some point if what is meant (or thought) is to be said, but it is not the case that the two derivations match up step-by-step. This, if anything, is simply a reflection of the mismatch I am delineating.

More importantly, there is the fact that the parliamentary idiom is manifestly more transparent as to its meaning – and, thus, as to how it relates to the underlying conceptual representation – than Wishart's own idiom. That is, given the relevant knowledge of parliamentary procedure, the sentence in (6), which does not have an extra *be*, is readily accepted as grammatical and its meaning easily computed in a way that the sentence in (8) clearly is not. Careful reflection may well help work out the actual meaning of (8), this being an interesting issue in itself, but the sentence could very easily be rejected as ungrammatical. The extra *be* in (8) is having an inordinate effect on the comprehension of the sentence, as anticipated earlier on, and in how the overall linguistic representation connects to the corresponding conceptual representation. There really aren't any extra *bes* and VPs in the conceptual representation, these are additions at the "what is said" side of the equation; the thought itself is something else altogether. This, in turn, highlights the actual mismatch between the linguistic and conceptual representations, which I suggest generalizes to many other sentences, the non-idiomatic included.

Putting it all together, then, the analysis of (8) indicates that its underlying syntactic representation does not respect the two main desiderata a language of thought must meet: content representation and content differentiation. Among some of the reasons adduced here, the various *bes* and *be puts* express, or are related to, rather different concepts – in at least one case *be put* forms a complex expression (or idiom), in another it is simply a verb form – and these *conceptual* differences are not explicitly codified in either the PHON or the SEM representation for the sentence. The underlying morphophonemic and syntactic features certainly license the respective linguistic representations, but they do not capture the differences in

meaning I have outlined. This is more dramatically demonstrated in the case of the extra *be*, which is entirely absent in the thought representation. Thus, the conceptual differences would appear to come from outside of language and in this case at least language appears to be *reflecting* rather than *constituting* the relevant conceptual differences.

Before closing this discussion, I should stress that what the linguist has to say about the sentence in (3), at the level of competence, is rather different from what the psycholinguist would have to say about it at the level of performance. In particular, the sort of mental architecture the linguist would have to postulate is very different from the sort of mental architecture that the psychology must, and this is likely to confuse matters a great deal. A case in point is the data on spatial reorientation, and the role of language therein, reported in Hermer-Vázquez, Spelke, & Katsnelson (1999) and Hermer-Vázquez, Moffet, & Munkholm (2001), as discussed by, *inter alia*, Carruthers (2002, 2012), Samuels (2002), and Lobina & García-Albea (2017). As argued in the latter two sources, those data point to the different ways in which various mental systems interact during a spatial cognition task, but they do not establish that natural language is in fact employed to connect different sources of information during such a task. In fact, there are reasons to believe that natural language does not play such a role at all (Lobina & García-Albea, 2017). As a matter of fact, psychology has no precedence in the study of thought (or thinking), even if psychologists usually have a more interesting and complicated story to tell, as is the case for (8). Instead, an analysis of the format properties of linguistic and conceptual representations must be undertaken before we venture into studying, *inter alia*, what effect acquiring a specific language has on cognition, how language is used in reasoning tasks, etc.

4. The Final Thought-in-Language

In this essay I have showcased some of the problems afflicting the literature on the relationship between language and thought, identifying two main problems. On the one hand, language and thought can be defined in various ways, and depending on which definition is employed the relationship will result in different and clearly incompatible sort of studies. On the other hand, the two phenomena can be related in various ways, and here too which way is selected will result in rather different but also ultimately incompatible studies. I have proposed well-established definitions for each domain and argued that priority should be given to an analysis of the representational vehicles each domain exhibits in order to work out what sort of structure thought representations have. To that end, I have offered but a primer of a competence-like analysis of the LoT as it pertains to a particular mismatch between linguistic and conceptual representations. Crucially, I have claimed, it is only when this question is more or less resolved that we can move on to such issues as the role of language in actual behavior, the interaction between language acquisition and cognitive development, the evolution of language and thought, and others.

Having said that, I do not wish to suggest that thoughts are generally not as convoluted as the syntactic structures they are related to, even if there may be some truth to that; nor would I want to claim that thought in general is structurally simpler than language. In the particular case I have discussed, I would argue that the sentence's convoluted structure points to the great *expressive* flexibility language confers to speakers, but this is a specific characteristic of linguistic cognition and there is no reason to believe that thought is like that too – after all, what may be meant need not ever be said. What I *do* claim is that there is a *particular* but widespread mismatch between the structure of a sentence's proposition and the syntactic structure of such a sentence. Namely, it is not only that the structures of thoughts and sentences are often not identical; my actual point is that they involve fundamentally distinct representational vehicles.

Other mismatches between linguistic and conceptual representations have been noted in the literature before, as mentioned earlier, but not quite in these terms. Fodor (2001b), for example, talks of language not being explicit enough to represent thought, as in a sentence such as *It's raining* – where, when, Fodor would ask. In such "Fodor cases," the relevant sentences do not seem to codify the thought one is having in full. Collins (2007), for his part, has pointed out that, when it comes to determining a sentence's proposition, language oftentimes offers either too much structure, as witnessed by the linguistic phenomena of raising/control pairs, ambiguity, passivization, etc., which find no analogue in thought representations, or too little, as the meaning of any given sentence typically needs to be enriched by specific pragmatic processes. My analysis exemplifies a different phenomenon altogether; it is not that there is too much or too little linguistic material in sentences such as (3) from the perspective of working out the sentence's proposition; rather, the point is that the *primitives* of linguistic and conceptual representations appear to be *fundamentally* different, and so are their respective structures and uses (cf. Segal, 2001).

What can we conclude regarding the underlying mental architectures of language and thought from all this, then? I submit the following final thoughts. An account of linguistic competence necessitates a computational operation (*merge*), lexical features, and two mechanisms to connect PHONs and SEMs to their respective interfaces, the sensorimotor and the conceptual/intentional. Thought, on the other hand, whilst also requiring a computational mechanism of some kind (perhaps even one like *merge*), would manipulate *concepts* rather than lexical items and a priori there would be no need for its mental representations to meet any of the interface conditions language has to respect. Consequently, *language* and *thought* appear to share fewer mental elements than what might at first be supposed. This is of course a tentative position, and the resolution of this issue is certainly an empirical question. What I have provided in this essay is a) a framework with which to approach such an investigation; and b) a discussion of the particular sort of mismatches that this framework brings to the fore.

There are many more cases of linguistic/conceptual misalignments – among others, grammatical illusions, ungrammatical but thinkable sentences, ellipsis phenomena, etc. – data that can be employed to firmly establish that language and thought *do* fall under different purviews, thereby requiring different types of theories. At the same time, however, we know a lot more about language than we know about thought, and this is reflected in the sophistication of our theories of language vis-à-vis our theories of thought (barren as the latter may currently be). This needs to be remedied if we are to settle the question at hand and I am hoping to provide some details anon, but first things first.

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The author confirms being the sole contributor of this work and approved it for publication.

Conflict of Interest Statement
The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

NOTES

1. This section draws from Lobina and García-Albea (2017), which it supersedes in some ways.

2. What are the other, less central representations the language faculty generates? Phonological representations, composed of phonological features and comprising hierarchical structures such as metrical and prosodic tiers, are plausibly compiled in tandem with, or right after, the generation of syntactic structures, but none of the phonological tiers would in principle be constitutive of thought (PHONs would emerge from these phonological representations, though, and since inner/outer speech is based on PHONs, they would supposedly play a role in the sort of story Clark, cited earlier on, envisions). The language faculty also generates properly semantic representations at the C/I interface in order to compute a sentence's interpretation (Pietroski, 2007), this time *paru passi* with syntactic derivations (Chomsky, 2008). Semantic representations are probably more relevant in a study of the language-thought relationship, but it is rarely argued that semantic representations are literally the representations employed in thought (Jackendoff, 1992, might be an exception), unlike the case of syntactic representations (see the references to Hinzen and Carruthers mentioned earlier).

3. I should add that I do not wish to hold the view that propositions are atemporal externalia, or possible worlds, or else. I here simply take a proposition to strictly refer to the *format* properties of mental representations, and I'm assuming that mental representations *are* indeed structured.

4. Despite the different structural relations, the actual notions of subjects (or arguments) and predicates would remain roughly the same in each domain (cf. Strawson, 1974, on this issue).

5. Seuren (2009) argues that logical subject-predicate structures are better described as topic-comment structures, but I shall employ the old-fashioned Aristotelian way of describing propositions as predicate-argument structures here.

6. That there is often a mismatch between linguistic and conceptual representations has certainly been noted in the literature before (e.g., in Collins, 2007; Fodor, 2001b). However, previous studies have not analyzed any mismatch in any detail, let alone from the perspective of what predicate-argument structure underlie particular sentences/thoughts, my approach here, as we shall see. Moreover, the discussion I shall conduct will expand upon previous studies in specific ways, thus providing a much more comprehensive take.

7. To my mind, entertaining a complex concept such as THE ISLAND OF SAGES AND SAINTS constitutes a case of having a thought too, but I shall focus on full propositions here.

8. Systematicity does not involve, as Johnson (2004) and Pullum and Scholz (2007) have it, the permutability of constituents across syntactic templates, which in many cases in fact fail (cf. *Alice showed Martha the book* vs. **Alice described Martha the book*, taken from Johnson's paper). As mentioned, systematicity is a matter of form and constituent structure, and certainly not of substituting constituents across sentence (or thought) types (see McLaughlin, 2009: 260–6, for further comments).

9. I am basing some of this characterization on Deirdre Wilson's 2004 lectures on the subject at UCL.

10. Even though I have used the works of Evans and Fodor to outline the internal structure of thought, my take on what thought must be like is not entirely compatible with their own. I won't spend any space drawing out the distinctions, though, and it is more productive to emphasize the similarities. In particular, the methodology they employed is certainly not foreign to my story; even though both Evans and Fodor employed linguistic examples to make their points, the phenomena they characterized is very often described in contrast to, or despite of, specific properties of language (Fodor, 2001b, is clearest in this respect, especially regarding the *compositionality* of thought vis-à-vis the compositionality of language).

11. A debate that was narrated by said journalist in the following web-link, where this sentence may be found: http://tinyurl.com/qgt6qa9. SNP and MP stand for Scottish National Party and Member of Parliament, respectively, but that's thankfully immaterial.

12. I am referring to the second last *be* as the extra *be* for convenience only, as I could instead refer to the last *be* as the extra *be*; indeed, both *be now put* and *now be put* are fine. We will have to keep this choice in mind in the discussion, especially as it relates to the question of which VP phrase exactly is actually the extra VP. The linguistic derivation of (3), which I will introduce presently, suggests that the extra VP is the second last instead than the last (as marked in 5), but I shall keep this specific, and somewhat secondary, issue to footnotes.

13. It is worth pointing out that the noted MP avoided the extra *be* when describing the event on his twitter account; *I tried to move – the question be not now put – now be put*, he tweeted at roughly the same time as he tried to close the motion in parliament (this can be found in the web-link provided in footnote 11). That is, in that communication Wishart doesn't seem to be taking *be put* to be idiomatic in itself, only the whole phrase, with no need for an extra *be*. The parliamentary report for the day (i.e., the Hansard) doesn't record

the actual words of Pete Wishart MP in "putting the question," only that he tried to close the motion twice (parliamentary protocol apparently establishes how such things are recorded in the official record). In any case, I assume the aforementioned journalist recorded the words of the MP faithfully; if not, it is the journalist who took the phrase *be put* to be a possible idiom within a common expression in British parliamentary discourse. It matters not; it was the output of someone's language faculty, either *a viva voce* or in writing. The standard phrase alongside the relevant procedure employed to close a motion can be found here: http://www.parliament.uk/site-information/glossary/closure-motion.

14. I depart from normal linguistic practice in that I do not employ the notation of set theory to describe the operations of *merge*. Instead, I use square brackets to mark the relevant syntactic units, two per line, this simply signaling that *merge* combines two such units each time it operates (each product will be evident in the very next line).

15. Given that a linguistic derivation establishes that predicates and arguments are generated side-by-side, the second last be in (3) is the extra be under my reading, but the correct extra VP would be the phrase headed by this be, contrary to what I had actually indicated in (5). Do note that the extra be and its accompanying VP phrase are both introduced in step 6. This is just one of the many mismatches between strings (or sentences) and their underlying syntactic structures, which I had to respect in the presentation as to not anticipate anything (and thus creating some more confusion).

16. This is entirely independent of the apparent fact that merge operates in basically the same way regardless of whether it puts two new lexical items together or moves an item from an already-built structure to a new position. And likewise regarding the more recent, and more accurate, description of movement operations as involving structures that contain two copies of the moved element; that is, [the questioni] [not be put [the questioni]] rather than [the question]i [not be put ____i].

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QUINE AND CHOMSKY: RULES AND DISPOSITIONS

DAVID KING
kingda@tcd.ie
Ph.D., Trinity College Dublin, Ireland

ABSTRACT. It has been 40 years since Quine has offered his critique of Chomskian Linguistics in his "Methodological Reflections on Current Linguistic Theory." The general consensus is that Quine's methodological arguments have failed and been adequately answered by Chomsky. In this paper I will review Quine's arguments and Chomsky's replies and demonstrate that Chomsky has not adequately answered Quine's criticisms. I will then argue that Devitt's methodological approach offers a third way which acknowledges Quine's criticisms but is not devastating to generative grammar.

Keywords: fitting and guiding; rules; processing rules; structure rules; competence and performance

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1. Chomsky and Quine: Fitting and Guiding

> My distinction between fitting and guiding is, you see, the obvious and flat-footed one. Fitting is a matter of true description; guiding is a matter of cause and effect. Behaviour fits a rule whenever it conforms to it; whenever the rule truly describes the behaviour. But the behaviour is not guided by the rule unless the behaver knows the rule and can state it. This behaver observes the rule (Quine, "Methodological Reflections on Current Linguistic Theory," 386).

Quine's methodological criticism of Chomsky's views on linguistics is over 40 years old and the consensus is that Quine's arguments have failed. In this paper I will demonstrate that Quine's arguments are much stronger than it is generally admitted and that Chomsky hasn't replied to these criticisms sufficiently. Quine begins his critique of Chomskian linguistics by distinguishing between two different types of rules: Fitting and Guiding. On Quine's picture a rule fits the behaviour

if the behaviour of the organism can be shown to conform to the rule. There may be many different rules which can be constructed that fit the behaviour of the organism. A rule guides an organism if the organism knows the rule and is able to state the rule. Quine claims that Chomsky uses a third intermediate type of rule; this is a type of rule which Quine argues is an implicitly guiding rule. Quine claims that Chomsky thinks that ordinary speakers of English are *guided* by rules even though these rules cannot be stated by the English speaker. According to this Chomskian picture, we can have two extensionally equivalent grammars, each of which *fits* the behaviour of the child, neither of which explicitly *guides* the child, and only one of which is *true* of the child. Quine claims that if this intermediate way of following a rule is to be made sense of, we need some type of evidence which will help us decide which grammar the child is implicitly following. He claims that a person's disposition to behave in determinate ways, in determinate circumstances, is the way to discover the rules that fit the organism's behaviour. If we want to discover the rules that the person is following then we need to question our speaking subjects. He speculates that such dispositions which may be relevant are those such as the disposition to make certain transformations and not others; or certain inferences and not others. Quine further notes that he has no problem with dispositions; and points out that a body has a disposition to obey the law of falling bodies, while a child has a disposition to obey any and all extensionally equivalent grammars. However, he can make no sense of Chomsky's intermediate notion of rule following. He alludes to the ironic fact that while Chomsky seems to have no difficulty with the obscure notion of implicit guidance by rules, he has serious difficulties with the humdrum notion of disposition.

Chomsky replied to this criticism by first questioning the analogy of a child following the rules of grammar with a body obeying the law of falling bodies (Chomsky, 1975: 189). He argued that this is a singularly misleading analogy because the rules of English grammar do not determine what a speaker will do in a given context in the same way that the law of falling bodies will determine, that if a person jumps from a building, he will hit the ground at a specified time. According to Chomsky, what the rules of English grammar tell us is that English speakers will *understand* and *analyse* certain sentences in certain ways, and not in other ways. In other words, the linguist in Chomsky's sense is trying to discover regularities in a person's linguistic competence; the linguist is not after a theory of performance. This reply of Chomsky's has two different strands to it: first, his distinction between competence and performance; second his claim that we can have no scientific theory of performance. His argument that by using idealisations, such as abstracting from memory and performance, we can gain some understanding of subjects like phonology etc. has something to recommend it. Idealisation plays a vital role in any science, and the appropriateness of an idealisation is to be judged by the success of the science which uses it. Given that generative linguistics has had some success, we can tentatively accept his idealisation. However, Chomsky's confident assertion that we cannot have a science of human performance/behaviour

has little to recommend it.[1] Quine's claim that people are obeying extensionally equivalent rules if their performance conforms to those rules is a perfectly legitimate claim. And Chomsky has offered us no reason to think otherwise.

Chomsky adds that even if we leave aside the purported disanalogy between the law of falling bodies and linguistic competence, Quine's formulation would still fail because he is guilty of treating physics and linguistics inconsistently. What Quine should have said if he wanted to remain consistent was: "English speakers obey any and all of the extensionally equivalent English grammars in just the sense in which bodies obey the law of falling bodies or the laws of some other system of physics that is extensionally equivalent" (Chomsky, 1975: 188).

Chomsky claims that when put in these terms, we see that linguistics is no more in need of a methodological cure than physics is. Chomsky's argument here is merely repeating the criticism which he made against Quine's Indeterminacy of translation argument. He is claiming that Quine is guilty of treating underdetermination as fatal in linguistics but as harmless in physics.

Chomsky notes that people are rarely, if ever, guided by rules in the sense of being able to state the rule they are following. Furthermore, he argues that linguists can go well beyond rules that merely fit the behaviour of people. He says that if we accept the same realistic attitude towards linguistics that we do with physics, then we can say that people are obeying rules which are really encoded in their brains, but of which they are usually not consciously aware. So we can use various different pieces of evidence to decide between extensionally equivalent grammars.

To make his criticism of Chomsky's conception of rules explicit, Quine discussed a toy example of two extensionally equivalent grammars which a person could obey. He asks us to imagine a string (abc) which can be divided up as extensionally equivalent grammars (ab) (c) versus (a) (bc). He notes that from a behavioural point of view, we could say that a person is following either of the grammars and that if we ask the native which is the correct grammar he will not be able to tell us. In this situation, he claims that Chomsky's view that the person can be said to be implicitly guided by rule (ab) (c) as opposed to (a) (bc) is senseless.

Chomsky argues that that there is no mystery in deciding whether the child is implicitly guided by rule system (a) as opposed to (b). In this situation, he argues all we have is a problem which can be solved by the ordinary methods of the natural sciences. Quine had argued that a natural solution to deciding whether (ab) (c) or (a) (bc) was the rule which implicitly guided the people, would be to ask them which rule they followed. He notes, of course, that the people will not be able to tell us. So he argues that since the natives cannot decide which rule they are implicitly following, and both rules are compatible with the dispositions of the ordinary language user, then the notion of one of the rules implicitly guiding the native is senseless. Chomsky agrees that asking the native will not get us far in deciding between rule (a) and rule (b), and he suggests a different way of dealing with the problem. He cites various different types of evidence which could theoretically bear on the problem. He discusses how the linguist could have evidence

which suggests that intonation patterns are determined by structure (Chomsky, 1975: 181). This evidence could be derived by studying our own language as well as other languages. He argues that such evidence might bear on the choice between the two proposed grammars. So we might discover that the rules needed for other cases give the correct intonation if we take the constituents to be those of (a) instead of (b). Whether this type of evidence really occurs or not is irrelevant. Chomsky's point is that Quine is incorrect to assume that no evidence on the topic is attainable beyond evidence gained by questioning the natives.

Chomsky cites a quote from Quine's paper "Linguistics and Philosophy" where Quine claims that there is much innate apparatus which will need to be discovered to tell us how the child gets over the great hump that lies beyond ostension. Quine further notes that if Chomsky's anti-empiricism says nothing more than that conditioning is not sufficient to explain language learning, then it is of a piece with his indeterminacy of translation argument. Chomsky notes that if Quine really believes that there is further innate apparatus waiting to be discovered by science, then this casts doubt on his claims in both his "Methodological Reflections" paper and in *Word and Object*. Chomsky asks us to consider the sentence: "ABC." Quine had claimed that we have no evidence which can help us determine whether a subject is implicitly following the rule (ab) (c) or (a) (bc). However, according to Chomsky, given that Quine has no problem with innate mechanisms of any sort, then surely it is possible we will discover an innate mechanism in our species which determines that we follow (ab) (c) as opposed to (a) (bc) or vice versa. So in this respect, he claims, Quine (1969) holds doctrines which run counter to the doctrines he accepts in (1960) and (1970).

Quine would deny this charge of Chomsky's. What Quine has said is that he has no problem with innate apparatus of any sort as long as such apparatus can be made sense of *behaviourally*. When he is discussing the notion of rule following, he is claiming that if two grammars both *equally* fit the behaviour of the subjects, and each subject is not consciously *guided* by these rules, then to claim that the person is implicitly guided by the rule is senseless. The postulation of innate apparatus which ensures that the child follows the rule (ab) (c) as opposed to rule (a) (bc) is pointless unless we have some behavioural evidence to justify such a postulation. The type of evidence which Chomsky claims could be useful to the linguist in deciding whether the subject is following rule A or B, i.e. perceived structure in intonation, *is behavioural evidence* so it does not bear on the type of considerations which Quine is concerned with.

A Chomskian could argue that if Quine would accept evidence such as structure intonation as a way of distinguishing between extensionally equivalent grammars, then he would be committed to accepting the Chomskian intermediate notion of a rule which implicitly guides the subject. Quine would of course rightly deny this. He would claim that, if we assume for the sake of argument that Chomsky's made-up example of structure in intonation pattern is correct, then it would follow that the two extensionally equivalent grammars do not fit the totality of linguistic

behaviour of the relevant subjects. He could argue that his flat-footed distinction between the two different types of rules can accommodate the type of example which Chomsky put forth. Quine could further claim that Chomsky has not fully explained his notion of the third intermediate notion of a rule.

This debate about the notion of a rule is a real point of contention between both thinkers. Chomsky has tried to explicate his intermediate notion of a rule as something in the brain which unconsciously guides the language user. This conception of a rule does not fit in neatly with Quine's two conceptions of a rule; the question is whether Chomsky's third notion captures something real which is missed by the two Quinean notions.

For simplicity's sake, let us consider a particular rule of English, the subject-auxiliary rule which states that when forming a question, one must move the main auxiliary to the front of the sentence. According to Chomsky, the subject auxiliary rule is a rule of English (and Spanish) though not of all languages; so it is a rule which requires some experience in order for acquisition of it to take place (Chomsky, 2006: 55–56). Children are only capable of learning this rule because they are genetically programmed to follow certain linguistic universal principles such as the following one: All languages are structure dependent.

On the Chomskian conception, the child is guided by certain rules which he does not know and cannot state (unless he has knowledge of linguistic theory). The question we now need to ask is why Quine would have difficulties with these rules, and can such rules be accommodated within his flat-footed conception of rules? Quine's emphasis on reinforcement and induction means that he would more than likely feel that the postulation of such innate rules is unnecessary. Nonetheless let us assume that Chomsky is correct that poverty of stimulus considerations dictate that rules such as structure dependence are known innately and that parametric variations of these universal rules result in particular languages being spoken.[2] The question which needs to be asked at this point is whether we can make sense of the notion of "rule" which Chomsky is postulating here?

When Quine wrote his "MRCLT" in the early 1970s Chomsky was operating with a rule-based conception of language. From about 1980 onwards, with the inception of his principles and parameters approach, Chomsky's conception of language changed. Though the change from a rule-based approach to a principles and parameters approach was a significant empirical advance, it does not have any effect on the criticisms which Quine brings to bear in his "MRCLT." So let us consider a question such as the following one: "Is the man who is happy over thirty?" which is derived from the statement "The man who is happy is over thirty." When forming this question, Chomsky claims the child begins with the statement and unconsciously applies the rule: move the main auxiliary to the front of the sentence. According to Chomsky, none of this is done consciously; rather, what happens is that a mechanism in the brain which is genetically programmed will interpret the data of experience and construct a model. The mechanism will determine what the rules of the language are, using the universal principles of the

language and having the parameters set through experience. When these parameters are set, we can say that the child is unconsciously following various different rules of English, such as the subject/auxiliary inversion.

Suppose we assume (falsely) that Quine would accept Chomsky's poverty of stimulus argument and agree that rules such as structure dependence are innate and that these rules determine that ordinary humans will derive rules such as auxiliary inversion when placed in certain linguistic environments. The question we now need to answer is how would Quine characterise these facts? The key point here is that Quine would focus on performance facts; he would ask whether people are disposed to form questions in ways consistent with these rules. Answering these questions would involve studying various different corpuses and seeing how people actually form questions when talking with others, or when writing various different texts. It would also involve constructing various different controlled experiments to see whether the manner in which questions are formed varies in the circumstances of speaking/writing. What Quine would object to is the reliance of Chomsky et al. on the intuitions of others as to what is or is not an acceptable way of forming questions. Quine would claim that the salient aspect of our studies should be the behaviour of the subject, not the intuitions of acceptability or unacceptability by the subjects of various constructions.

However, the next question to ask is what Quine's response would be if the behaviour of the subjects and the acceptability tests lined up perfectly. So Quine would have the following facts to account for[3]: poverty of stimulus considerations, subject's intuitions of the acceptability or unacceptability of certain constructions, and subject's behaviour in certain determinate circumstances. In this circumstance, Quine would claim that the person's behaviour fits with any and all extensionally equivalent grammars which capture the behaviour of the subject. He would say that we are justified in claiming that the person's behaviour conforms to a particular rule system (and other extensionally equivalent systems). He would have to object to any postulation of innate apparatus because there is no justification for postulating one rule system over another one. He would accept any innate apparatus if it was determined by behavioural facts; however, no behavioural facts (including the phonological tests suggested by Chomsky) will help us decide between attributing rule system (A) over rule system (B), if they are extensionally equivalent. So on this Quinean picture, the rules which we claim the behaviour of the child fits do so in the same way the behaviour of physical objects fits certain rules of physics. So rules discovered in this behaviourist manner would easily conform to Quine's flat-footed conception of rules fitting the behaviour of the subject. There would be no need for the Quinean to postulate an intermediate type of rule which implicitly guides the subject.

2. Problems with Normativity

There is, however a difficulty with this Quinean conception of the behaviour of the child fitting certain rules. The difficulty stems from normative issues. The Chomskian picture conforms to our pre-theoretical intuitions about language in one clear sense. It seems obvious that when I construct a new sentence, the sentence will be grammatical or ungrammatical according to the rules of the language. So, for example, most people would believe that if I construct a new sentence there will be a fact of the matter as to whether the sentence is grammatical or not. However, if we are deriving our rules of language by studying how people actually perform, then at best, all we can speak of is the probability of an utterance with a certain syntactic structure occurring or not. We will have no warrant to claim that the sentence is grammatical or ungrammatical. From a behavioural point of view, we can say that the sentence is atypical but not that it is incorrect. This seems like a serious difficulty with Quine's conception of the nature of rules. He could reply to this concern by claiming that we could test whether the sentence was grammatical by the lights of the linguistic community by asking its members. However, this reply does not solve our problem; rather, it reintroduces the problem in a different guise. If we ask people whether this or that construction is acceptable, we are testing their intuitions in the same manner that Chomsky recommends. If people's intuitions all agree that a certain construction is ungrammatical, but performance data indicates that the construction is used and accepted in ordinary speech, then we have arrived at an impasse. Furthermore, if people's intuitions of acceptability disagree with their actual performance, then Quine would argue that we would have to give preference to performance data over people's intuitions of acceptability. The problem with this is that if people's intuitions cannot be used to help us decide between a correct or an incorrect linguistic utterance, then we seem to have no way of doing so. All we have are linguistic regularities, and constructions which are irregular from that point of view.

To clarify the above difficulty let us consider a computer. From a performance point of view, the computer exhibits certain regularities. So, for example, if I press the caps lock key when typing in Microsoft Word it results in the words I type afterwards being capitalised. When I press the caps lock key again, the computer no longer types in capital letters. Now imagine if one day I press the caps lock key and the following symbol appears on my screen *. Imagine I continued pressing the key for a while and the symbol * kept appearing. You can be quite sure that if this happened, nobody would think to themselves "Strange, the probability of my letters being capitalised when I press the caps lock button has just been reduced." It is a safe bet that anybody who noticed that the caps lock key being pressed resulted in * being typed would assume that the computer was broken. This assumption would be based on the fact that we know that the computer was designed for a particular purpose which it is no longer achieving efficiently. So we would assume that some part of the computer was broken and set about getting it repaired.

Now in natural language such an approach is possible as well. Take, for example, people with severe schizophrenia, or with some form of aphasia. People with schizophrenia sometimes speak with what is known as word-salad. Such word-salad sentences sometimes exhibit syntactic, semantic and pragmatic deviance. People with some forms of aphasia are sometimes incapable of forming sentences into syntactic units. Analysing sentences from schizophrenics and aphasics is no trivial matter, and understanding the way such sentences go wrong is a flourishing field of psycholinguistics and neurolinguistics. Any theory which claimed that the speech of aphasics and schizophrenics was just statistically unlikely rather than incorrect seems to be seriously deficient. Furthermore, as opposed to the case of the computer, we cannot say in this case that such people are in error because they are behaving contrary to their designers' intentions. Who designed English that we would be sinning against if we speak ungrammatically? Chomsky would answer that people speaking in such a deviant manner are breaking the implicit rules of universal grammar and this explains our judgements that such people are speaking ungrammatically.[4] Quine, who rejects appeal to implicit rules which govern what sentences we accept as grammatical, will need to tell a different story of how such sentences are viewed as deviant.

In the rough and ready world of ordinary discourse, Quine recognises that intentional idioms are indispensable. It is only when we are trying to limn the true and ultimate scheme of reality that such idioms have no place (Quine, 1960: 216). It is also in the rough and ready world that people's behaviour (including their verbal behaviour) is viewed as deviant. It is from this rough and ready vantage point that people are judged to be suffering from schizophrenia and aphasia.[5] Quine would have no problem with using this pragmatic idiom in daily discourse while using the more precise discourse of neurology and behavioural science when trying to limn the ultimate nature of reality. So in this sense the schizophrenic and aphasic objection does not in any way affect Quine's argument.

To the objection that Quine's flat-footed conception of rule following cannot handle normative notions like correct and incorrect grammar the same reply as above will suffice. First, Quine can point out that in ordinary discourse, when applying the dramatic idiom of intentionality, we can judge that certain statements are unclear, badly structured, pragmatically deviant, etc. However when we are limning the true and ultimate structure of reality, we can do no better than say that people are following whatever extensionally equivalent grammars can be constructed to systematise their utterances. To people such as Chomsky who claim that people follow one true grammar as opposed to any and all extensionally equivalent grammars, Quine would reply that we have in-principle no behavioural evidence which can decide between them. And without such evidence, all we are justified in positing is Quine's flat-footed conception of rule following.

As we have already seen, Chomsky would greatly object to this characterisation because he does not think that syntactic rules can be studied in terms of performance. The important thing to note is that at this point we do not know whether

a theory of syntax, semantics, etc. is possible in terms of performance. We do not know whether people's grammatical intuitions match up with their actual linguistic behaviour, though from the empirical data to date they clearly don't (Sampson, 2002). A further difficulty stems from the fact that Chomsky does not typically offer statistical analysis of people's grammatical intuitions,[6] and when studies have been done[7] the result's have revealed much greater variety in people's intuitions than Chomsky would admit. So Chomsky's confident assertions aside, we do not know whether it is possible to construct a theory of performance yet, and discovering whether this is possible or not will require empirical research, not rhetoric. This bears on the debate between Chomsky and Quine on the nature of rules. If a science of behaviour is tractable then Quine's conception of the behaviour of various subjects fitting syntactic rules will be the most accurate way of conceiving the facts. However, if it is shown that Chomsky is correct that a science of human behaviour is impossible, then Chomsky's conception of a third intermediate type of rule will be the correct picture.

3. Devitt's Third Way

In the years since Chomsky and Quine have debated these issues some philosophers and scientists who are sympathetic to Generative Grammar have critiqued Chomsky in a manner similar to Quine (though not identical). Since these philosophers are not behaviourists like Quine it may be worth considering their work and the degree to which it can help us disentangle some of the issues between Chomsky and Quine.

Michael Devitt's 2006 book *Ignorance of Language* deals with some of the issues raised by Quine but his solution to the problems Quine raised are very different. Devitt thinks that while the theoretical discoveries made by linguists in Generative Grammar are interesting these discoveries are misdescribed. At least since Chomsky's *Aspects of a Theory of Syntax* in 1965, Chomsky has described linguistics as a branch of psychology. Over the last 50 years very little has changed except generative grammarians now like to call themselves biolinguists. Calling themselves biolinguists is not some move away from considering linguistics a branch of psychology. Chomsky's constant talk about the mind/brain being the same thing viewed at a different level of abstraction shows that for him the biological study of the brain and the psychological studying of the mind are the same thing at a different level of abstraction. Over the last 50 years, views within generative linguistics about the nature of its subject matter have remained consistent.

Nonetheless there have been some dissenters. Philosopher Jerrold Katz and linguist Paul Postal have argued that the subject matter of linguistics is not the psychological states of speaker/hearers, but rather linguists are studying abstract Platonic entities. In their "Realism vs Conceptualism in Linguistics" they claim that the arguments that Frege made against the psychologism in logic and mathematics are just as devastating when applied to psychologism about language. They go on

to note that while understanding the psychology and neuroscience of mathematical competence is an interesting topic it is a distinct subject than actually doing mathematics. Mathematics is concerned with the manipulation of abstract objects. They argued that the same situation should apply in linguistics. Understanding the psychological competence involved in language comprehension/production is an interesting subject but it is not the subject of linguistics; linguistics like mathematics is concerned with understanding the abstract entities that make up linguistic reality.

Devitt, like Katz and Postal, argues that linguistics is not a branch of psychology. However Devitt doesn't share their Platonism. Devitt claims that the subject matter of language is linguistic reality, not psychological reality. When he speaks of linguistic reality Devitt not referring to a realm of abstract objects; rather he is referring to spoken and written linguistic inscriptions. Katz and Postal's conception of linguistics has been attacked as being based on a flawed analogy with mathematics and linguistics while Devitt has been accused of misrepresenting Chomsky's views on linguistics.[8] In this author's opinion Devitt's arguments have been underestimated and his critics have not refuted his arguments against making a distinction between the processing rules we use when acquiring our language and the structural rules of language discovered by linguists.

Devitt asks us to make a clear distinction between the competence we have to produce linguistic outputs and the linguistic outputs themselves. There is no a priori reason to think that the structural rules of linguistic output are the same as the processing rules that is used to create output. On Devitt's conception it is the linguist's job to study the outputs of language and the psychologist's job to study the processing rules that create this output. Devitt uses a series of analogies to make his point: "In sum, to be a processing rule that governs the activities of a chess player, logic machine or dancing bee is one thing, to be a structure rule governing the outputs of such activities is another. And a structure rule of the outputs may have no place among the processing rules that produce these outputs" (Devitt, *Ignorance of Language*, 21).

Devitt's analogies are convincing ones. He is surely correct to argue that few theorists studying the Bee's waggle dance would argue that the structural rules they discover are the same as the processing rules that the bee uses when performing the dance. The question then becomes why is the study of language treated differently? Why do generative grammarians argue that the structural rules they uncover are identical to the processing rules used in acquiring a language?

Devitt links his argument to the dispute between Quine and Chomsky in the mid seventies about the nature of linguistic rules. As we saw above in Quine's "Methodological Reflections on Current Linguistic Theory" he argued against Chomsky's theory of people being implicitly guided by linguistic rules that they are not aware of. Quine had no problem with saying that the linguistic behaviour of people conformed with certain rules but that he could make no sense of people being implicitly guided by these rules. The reason Quine was sceptical about people being implicitly guided by rules was because it was possible to construct extensionally

equivalent grammars which differed from each other. And since on Chomsky's picture people did not know what rules they were following in language production it, for Quine there was no way to decide which extensionally equivalent grammar the person was following.

Overall Quine's criticism didn't really convince many linguists as they found his behaviourism too radical. One might see in Devitt's arguments a possible vindication for Quine's views. Devitt linked his views to Quine in the following manner:

> This bears on a popular criticism of the claim that a grammar's rules are psychologically real. The criticism is that we lack evidence as to which grammar's rules are psychologically real: 'If we can come up with one grammar for a language, we can come up with many which, though they posit different syntactic rules, are equivalent in their explanation of meaning: they are equally able to capture all syntactically determined facts about meaning. We need psycholinguistic evidence to show grammar's rules are in fact playing the role in linguistic processing, evidence we do not have.' This criticism is not quite right...We need evidence that the syntactic rules of any grammar are processing rules. These rules may simply be the wrong sort of rules to be processing rules, just as the rules of the bee's dance very likely are, and the rules of the logic machine's language certainly are. Suppose, as seems quite likely, that the human language capacity is an adaptation. Then nature faced the problem of designing this capacity out of pre-existing structures in our ancestors. We should not think, in advance of empirical discovery, that nature solved this problem by making humans go through processes governed by linguistic rules. We should not suppose a-priori that a correct account of linguistic reality will describe the psychological reality. A grammar may have nothing more to do with psychological reality than comes from its meeting the Respect Constraint (ibid., 37).

Devitt's analysis involves acknowledging that Quine's claim about extensionally equivalent grammars undermines Chomsky's claim that the structural features he discovers are necessarily the processing ruled governing linguistic competence. But Devitt goes further. He argues that given that we have no reason to follow Chomsky in thinking that the structural rules we discover when doing linguistics are the same as the processing rules used in linguistic competence then Quine's postulation of extensionally equivalent grammars is harmless. If as a matter of empirical fact we have multiple extensionally equivalent grammars so be it. This will have no consequences for the processing rules as long as the extensionally equivalent grammars respect the processing rules.

Devitt's distinction between processing rules and structure rules offer a way of dissolving a forty year old debate between Quine and Chomsky. While Devitt did not agree with Quine's behaviourism; Devitt's division of labour between psycholinguistics and the grammars discovered by generative grammarians, acknowledges Quine's point while showing that it is not as devastating to generative linguistics as

Quine may have believed. Nonetheless it must be admitted that since Devitt's arguments have failed to convince many generative grammarians the hope that his work can be used to bridge the divide between Chomsky and Quine is probably futile.

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The author confirms being the sole contributor of this work and approved it for publication.

Conflict of Interest Statement
The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

NOTES

1. Strictly speaking Quine doesn't even need a strong theory of performance to make his point of rule following. Quine noted in his reply to Chomsky that he didn't need a theory of performance in the sense of discovering the probability of a person having a disposition to utter a sentence outright. Rather Quine just needs to be able ascertain a person's disposition to assent or dissent to a sentence if asked. Nonetheless as Quine's Indeterminacy of Translation argument shows getting to the point of asking for yes or no answers requires intersubjective triangulation between subjects and the environment causing sensory impingements on the subjects. This process of interpretation requires a theory of performance (which Quine sketches in behaviouristic terms). So the issue of performance is vital in understanding the differences between Chomsky and Quine.

2. The evidence strongly indicates that Chomsky is incorrect on this point see King (2016a), "Poverty of Stimulus Arguments and Behaviourism."

3. In reality, Quine does not have this collection of facts to account for because as, Chomsky's poverty of stimulus argument is dubious (King, 2016a; Pullum and Schulz, 2002; Sampson, 2002), and performance data does not match up closely with competence data (Sampson, 2002).

4. Obviously, there is more to schizophrenic word-salad than ungrammatical sentences; however, I am just focusing on ungrammaticalness because it is directly relevant to the debate between Chomsky and Quine on this particular point.

5. The rough and ready vantage point includes the judgements of psychiatric workers, who help themselves to intentional idioms and physical idioms as is useful for their purposes.

6. Though Chomsky et al. (2011) is moving in the right direction in at least acknowledging the importance of Corpora in linguistics.

7. For some research on the statistical analysis of people's grammatical intuitions, see Lappin and Clark (2010), *Linguistic Nativism and Poverty of Stimulus.*

8. For criticism of Devitt's work, see John Collins' review "Ignorance of Language by Michael Devitt," and Paul Pietroski's review "Think of the Children," and for replies to these reviews see Devitt, "A Response to Collins' Note," and "Methodology in the Philosophy of Linguistics."

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A MISCONCEPTION OF LOGIC IN ITS DIFFUSION ACROSS NON-MATHEMATICAL ENVIRONMENTS: THE EMBARRASSING MISTAKE OF RELYING ON NATURAL LANGUAGE

EDGAR ANDRADE-LOTERO
edgar.andrade@urosario.edu.co
Department of Applied Mathematics
and Computer Science,
Universidad del Rosario, Bogotá, Colombia
JULIÁN M. ORTIZ-DUQUE
ortizd.julianur@gmail.com
Independent Scholar, Colombia

ABSTRACT. In this paper we criticize a widespread practice in the teaching, use, and dissemination of first-order logic in non-mathematical environments. This practice consists in the presentation of the truth-conditions of logical formulas by means of sentences in natural language – e.g., if '*s*' represents Socrates and '*H*' represents the property of being human, '*Hs*' is true iff Socrates is human. We will argue that it is inadequate a presentation of the semantics of first-order logic and that it is problematic for the study of natural language. Our argumentation is three-fold. First, there are constructions in natural language that do not behave as this logic requires. Second, the use of natural language is not able to provide an explanation of the semantics of individual constants and predicates. Third, this practice instigates the idea that natural language possesses a formal structure, and does so unreflectively and without justification.

Keywords: semantics of first-order logic; translational semantics; natural language semantics; formal semantics; logic teaching; formal structure of natural language

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1. Introduction

Argumentation is taught in many ways. Even though argumentation could be taught informally, there are a number of careers in the humanities, especially

philosophy, for which formal logic is the preferred way to set a standard for good arguments. Insofar as the teaching of argumentation is implemented by means of formal logic, one of the instruments would be a textbook on first-order logic. There are a number of textbooks that fill this role, and they are in the business of presenting their subject matter in as accessible a way for a non-mathematical audience as possible. Despite their purpose of being accessible, however, they cannot waive the requirement of doing a proper presentation of their contents. Such a propriety is always up for assessment, since the quality of a textbook depends upon it. In this paper we set out to criticize a number of textbooks that are widely used nowadays (and, incidentally, also some influential texts in the history of logic). All of them draw upon a common practice of teaching (or disseminating) first-order logic. This practice consists in the presentation of the semantics of first-order logic (SFOL for short) by means of the use of natural language (NL for short) as if it constituted a semantics. We shall argue that this is not a proper presentation of SFOL, and that it has negative consequences for the dissemination of logic in non-mathematical environments.

It is important to emphasize at the outset that our discussion is not restricted to a note on what kinds of texts teachers of logic should use to prepare their courses outside mathematical environments. It also makes part of larger discussions about what logic is, how we should apply formal tools in philosophy, and what the meanings of NL sentences are. We will underline some connections with these larger discussions along the way, some of them in the footnotes.

An example of the practice in question is the following. Suppose '*a*' is an individual constant and '*B*' a monadic predicate. In order to explain the truth-conditions of the formula '*Ba*' one can appeal to some translation keys, such as '*a*' is translated as/means/stands for Andrew, and '*Bx*' is translated as/means/stands for *x* is bald.[1] Hence, '*Ba*' is true if, and only if, Andrew is bald, or so the explanation goes. We shall refer to this practice as *translational semantics* (TS for short).

From a historical point of view, the most pristine example of a TS, although not restricted to first-order logic, comes from Carnap's semantical systems, developed first in Carnap (1942) and later expanded in Carnap (1947). For Carnap, a semantical system is "a system of rules, formulated in a metalanguage and referring to an object language, of such a kind that the rules determine a truth-condition for every sentence of the object language" (Carnap, 1942: 22). The object language is a formal language, and the metalanguage is a natural language (expanded with logical symbols). Sentences in the metalanguage are used to provide truth-conditions for sentences (formulas) in the object language. We can use a small example to illustrate this idea (Carnap, 1942: 23f). Suppose that there are individual constants (*a*, *b*, *c*), predicates (*B*, *H*), and auxiliary symbols ((,)). Suppose further that *a* designates Chicago; *b* designates New York; *c* designates Carmel; *B* designates the property of being large; and *H* designates the property of having a harbor. Now, let α be an individual constant and β a predicate. Then the rules of truth of the system determine that $\beta(\alpha)$ is true (in the system) if, and only if, the designatum of α has

the property designated by β. In particular, the system provides the following truth-conditions for '*H*(*b*)':

> '*H*(*b*)' is true (in the system) if and only if New York has a harbor.

In general, this system provides truth-conditions of the form

> '*s*' is true iff *p*,

where '*s*' is a formula and '*p*' a natural language sentence, for every formula in the object language.

Another very influential kind of TS consists in the practice of a step-by-step transformation of a sentence in natural language into a formula in first-order logic. A paradigmatic case in this regard is Quine's book *Methods of Logic* (Quine, 1950). Quine leads us to entertain the idea that this transformation makes explicit the sentence's underlying logical form, preserving its truth-conditions.[2] For instance, if the schematic letter '*Fx*' represents the open sentence '*x* is a book' and '*Gx*' represents '*x* is boring', then $\exists x(Fx \wedge Gx)$ is true iff some books are boring (Quine, 1950: §16).

A more recent example of a TS can be found in the first five editions of *The Logic Book* (Bergmann et al., 2008), which present the semantics of first-order logic by means of symbolization keys. Consider the following quote:

> We can view the symbolization keys for sentences [...] as embodying interpretations for those sentences. That is, the truth-conditions of sentences of [first-order logic] are dependent upon the choice of universe of discourse and upon how each of the predicates and individual constants in the sentences are interpreted. [...] Let us start with [the] example '*Fa*'. Whether this sentence is true depends on how we interpret the predicate '*F*' and the individual constant '*a*'. If we interpret them as follows:
> *Fx*: *x* is human
> *a*: Socrates
> then '*Fa*' is true, for Socrates was human (Bergmann et al., *The Logic Book*, 379).

It is important to emphasize that the metatheoretical concepts of first-order logic – e.g., tautologies, equivalences, valid arguments, etc. – are defined on the basis of such a semantics. This becomes clear when we note (in the fifth edition) that interpretations by means of symbolization keys are introduced in section 8.1, the metatheoretical concepts in sections 8.2–8.6, and the extensional interpretations (i.e., the model-theoretic definition) only until section 8.7. Therefore, the use of symbolization keys was not just for the sake of presenting only a few introductory examples – which in itself is prone to error – but constitutes a semantics on its own.[3]

Now, in the 6th edition (Bergmann et al., 2013), the authors changed their presentation. Instead of saying that symbolization keys 'embody' interpretations,

they say that "[t]here is a sense in which the symbolization keys [...] provide interpretations" (ibid., 330). They now state that "interpretations only need to specify the things of which the predicates are true, rather than provide English-language readings for the predicates" (ibid., 331). Moreover, they now only include examples with the set of positive integers. It appears, then, that the authors have realized the pitfalls of using natural language to interpret first-order formulas. We feel relieved about this change. Nonetheless, a justification for it is nowhere to be found in the book. But such a justification is required. Firstly, because they are moving away from a presentation that should be exposed for what it is: a problematic presentation of the semantics of SFOL that should no longer be disseminated. And secondly, because despite the change in presentation, the fact that *The Logic Book* still features exercises with interpretations in natural language tells that the root of the problem may still be alive and grow again.

To bring this brief recount to a close, we just want to mention that there are other textbooks that are examples of TS, such as Magnus (2010) and Páez (2007).

A comment about our terminology is in order, since there is another way in which the term translational semantics has been used. What we have in mind is the widely read exposition of Evan's and McDowell's (Evans and McDowell, 1976) about theories of meaning and truth, which also features the term *translational semantics*. It is important to separate our use of this term from theirs. Translational semantics, in Evan's and McDowell's exposition, refers to a kind of theory of meaning that provides clauses such as (1), instead of clauses such as (2), where the latter are provided by theories of meaning of the kind proposed by Donald Davidson (cf. Davidson, 1967):

(1) '*s*' is translated as '*p*'
(2) '*s*' is true iff *p*.

Our use of the term does not correspond to practices using (1). Rather, the practice that we refer to by means of the term TS is one in which a clause like (2), in which '*s*' is replaced by a formula in first-order logic and '*p*' by a sentence in natural language, is used to provide the truth-conditions of '*s*'.[4]

Now, even though there are several widely used textbooks promoting TS, it is worth mentioning that not every textbook promotes it. There are also widely used textbooks that present the semantics of first-order logic by means of Model Theory, some at the undergraduate others at the graduate level, such as Gamut (1991); Sider (2010); Smith (2003); de Zwart (1998). These are examples of textbooks that people outside mathematical environments are better off using in order to understand the semantics of first-order logic.

As a final introductory note, we would like to point out that earlier public presentations of our critique of this practice have been received in different ways by mathematicians and philosophers. The former tend to belittle the range of dissemination of this practice, as if it were confined to "some (poorly-conceived) introductory texts". The latter, on the other hand, tend to feel that it is a normal and

convenient practice. But it should be clear to both mathematicians and philosophers that this is a widespread practice in non-mathematical fields, and that this fact does not dismiss the need for a proper treatment of the subject.

Our attack on TS consists in advancing three arguments. First, there are a number of constructions in NL that do not behave in the way required by SFOL (§2). Second, even if we could restrict our attention only to those constructions that are 'well-behaved', the use of NL to interpret logical formulas is not able to provide an explanation of the semantics of individual constants and predicates, and therefore, it has negative consequences for the dissemination of first-order logic in non-mathematical environments (§3). Third, this practice incites the idea that the semantics of NL – at least for those constructions that are 'well-behaved' – is structurally identical to SFOL, and does so unreflectively and without justification (§4). In the sequel we will develop each of these arguments in turn.

2. Touchy Constructions

There are well-behaved constructions, such as the following:

(3) Every human is mortal.
Socrates is human.
Therefore, Socrates is mortal.

This construction has been a paradigm when it comes to the elaboration of valid arguments. Intuitively, we know that it is necessary that if its premises are true, so is its conclusion. This construction has been formalized by means of the following valid argument in first-order logic (FOL for short):

(4) $\forall x(Hx \rightarrow Mx)$
Hs
$\therefore Ms$

We can connect (3) and (4) using a TS such that '*s*' represents Socrates, '*Hx*' represents that *x* has the property of being a man, '*Mx*' represents that *x* has the property of being mortal, '$\forall$' represents every, and '$\rightarrow$' represents if...then.

Let's try to make explicit the connection between (3) and (4) so that it can be applied to any kind of argument. Let *X* be an argument in NL and *Y* an argument in FOL such that there is a TS that links *Y* with *X* – i.e., individual constants in *Y* represent proper names in *X*, predicates in *Y* represent properties in *X*, etc. We are going to assume that, when we apply the standard procedure for formalizing *X* into an argument in FOL, we obtain *Y*.[5] We say that *X* is 'well-behaved in FOL' iff the following condition holds: *Y* is valid in FOL iff there is a truth-preserving entailment from the premises of *X* to its conclusion.[6]

Thus, for example, (3) is a well-behaved construction in FOL since the TS specified earlier constitutes a link between (4) and (3), (4) is the standard formalization of (3) in FOL, there is a truth-preserving entailment in (3), and (4) is valid in FOL.

Now, the literature in philosophy of language is rife with constructions that are not well-behaved in FOL. Let's consider the following construction:

(5) Bruce Willis has 0 hairs in his head and is bald.
Jim Morrison has 1 million hairs in his head and is not bald.
If someone with 0 hairs in his head is bald, someone with 1 hair is still bald.
If someone with 1 hairs in his head is bald, someone with 2 hairs is still bald.
⋮
If someone with n hairs in his head is bald, someone with $n + 1$ hairs is still bald.
⋮
If someone with 999.999 hairs in his head is bald, someone with 1 million hairs is still bald.
Therefore, Jim Morrison is bald.

Let's consider the TS such that 'b' represents Bruce Willis, 'j' represents Jim Morrison, 'Bx' represents that x has the property of being bald, 'N_nx' represents that x has the property of having n hairs in his head. By means of this TS, we can link (5) and (6):

(6) $N_0b \wedge B\mathrm{b}$
$N_{1\text{million}}\, j \wedge \neg Bj$
$\forall x, y\, (N_0x \rightarrow Bx) \rightarrow (N_1y \rightarrow By)$
$\forall x, y\, (N_1x \rightarrow Bx) \rightarrow (N_2y \rightarrow By)$
⋮
$\forall x, y\, (N_nx \rightarrow Bx) \rightarrow (N_{n+1}y \rightarrow By)$
⋮
$\forall x, y\, (N_{999.999}x \rightarrow Bx) \rightarrow (N_{1\text{million}}y \rightarrow By)$
$\therefore Bj$

It is not difficult to see that (5) is not well-behaved, since there is no entailment in (5) (the predicate 'bald' is vague, so the chain of inferences must break at some point, because Jim Morrison is not bald), whilst (6) is valid in FOL (cf. Hyde, 2014).

Another example: Consider the following argument in FOL:

(7) $B(g, b)$
$b = w$
$\therefore B(g, w)$

This argument can be linked, by means of a suitable TS, with (8):

(8) Inspector Gordon seeks Batman.
Batman is Bruce Wayne.
Therefore, inspector Gordon seeks Bruce Wayne.

But clearly, (8) is not well-behaved, since there is no entailment in (8) (because Gordon does not know that Bruce Wayne is Batman and for him to seek the former is not the same as to seek the latter), whilst (7) is valid in FOL.

These are not isolated examples, on the contrary, there is an extensive literature about the limitations of FOL to provide what is traditionally known as the logical form of sentences in NL; we can find discussions about 'and', 'or', 'if...then', quantifiers and determinants, adjectives, proper names, adverbs and events, etc. (compare the compilation of arguments in Bach, 2002, and the references therein).

At this point it is important to address a relevant criticism of our argument, according to which we fail to distinguish between two different tasks: (a) the translation of sentences in NL into formulas in FOL; and (b) the provision of truth-conditions to formulas in FOL by means of sentences in NL. (Observe that TS, as we have defined it here, coincides with task (b).) The previous examples containing vague and intensional predicates create problems for (a), not (b). These examples show that FOL is not able to capture the implicit semantic phenomena in these constructions in NL; but they do not show that it is impossible or inappropriate to provide truth-conditions to constructions such as (6) and (7) by means of sentences in NL, or so goes the criticism of our argument. Now, we do not deny that it is possible to come up with constructions that are well-behaved in FOL in order to provide truth-conditions for (6) and (7). However, we sustain that the naive use of a TS is a recipe for making logical mistakes. Without any prior restriction on the constructions in NL that we can take into account in order to interpret formulas in FOL, counterexamples to tautologies and valid arguments are not difficult to come by. This is more conspicuous when we recall two things: (i) in the practice of TS these metatheoretical concepts – i.e., tautologies and valid arguments – are defined on the basis of interpretations presented in natural language (see §1); and (ii) these two concepts ask us to take into account the totality of possible interpretations of formulas in FOL. Consequently, in TS, a formula is a tautology if it is true in every possible interpretation in natural language; an argument is valid if every interpretation in natural language that makes the premises true, also makes the conclusion true.

The following considerations about the difference between errors in task (a) and errors in task (b) can be useful to further convince the reader that our examples can be brought to bear on task (b). On the one hand, it makes sense to study the typical

mistakes that students make in translating a sentence in NL into a formula in FOL – i.e., errors in task (a) – by producing a taxonomy of the kind of possible mistakes and relating them with certain constructions in NL (cf. Barker-Plummer et al., 2008). For instance, there is convincing evidence that a construction such as 'only if' in a sentence in NL is likely to elicit the error of reversing the antecedent and the consequent when translating it into FOL. This sort of study can give rise to a teaching plan that takes into account these difficulties in translating sentences from NL into FOL (cf. Palau and Coulo, 2011). On the other hand, regarding errors in task (b) – i.e., errors in the use of TS –, we have a whole different story. The error in which a student incurs if he or she provides truth-conditions to a formula such as $B(g, b)$ by means of the sentence 'Inspector Gordon seeks Batman' is of a different nature than that of a translation error. We should tell the student that he or she cannot use intensional verbs, such as 'seek', because they cannot be used to represent truth-conditions in FOL. This is not an error on the student's part, but rather it is an inadequacy of the tool – i.e., the TS.

Despite the fact that no textbook is careful enough to warn the reader of such perils, an advocate of TS might argue that with a prior delimitation of the constructions in NL to those that are well-behaved, it is legitimate to use TS without risk of logical error in the presentation of SFOL. This suggestion has two problems. First, which constructions should make part of the list of well-behaved constructions is not exempt from controversy. To be sure, there are constructions that are paradigmatic and which indisputably could go into the list. For instance, construction (9) is well-behaved:

(9) Lightning McQueen is a red car.
Therefore, Lightning McQueen is red.

In order to capture this inference from premise to conclusion we need to use the conjunction of two predicates: 'red', represented by 'Rx', and 'car', represented by 'Cx'. Let's assume that 'm' represents 'Lightning McQueen'. Thus, (9) can be represented by (10), which is valid in FOL:

(10) $Cm \wedge Rm$
$\therefore Cm$

On the other hand, there are constructions that are not so paradigmatic and which are up for discussion. Take (11) for instance; is it well-behaved or not?

(11) Doraemon is a plastic cat.
Therefore, Doraemon is a cat.

If we are of the opinion that science determines the extension of predicates in NL, in a way such that in the extension of 'cat' there are only creatures made of flesh,[7]

we would say that (11) is not well-behaved – since (11) would be invalid in NL, whilst (12), its representation in FOL, is valid:

(12) $Gd \wedge Pd$

$\therefore Gd$

But if we think that it is the use of predicates in everyday life what determines their extension, we could be fine with the idea that a plastic cat is a cat. Therefore, (11) would be well-behaved. How can we solve this dispute? We believe that there are no theoretical tools that are solid enough to solve the dispute in one way or the other. So there is no uncontroversial way of producing the list of well-behaved constructions.

The second problem is that, even if we could build such a list, it would be far too cumbersome a tool that it would create more problems than it would solve. TS might be an effort to facilitate the learning of SFOL, but its correct usage requires a proper use of the list of well-behaved constructions. In order to properly use it, a lot of effort should be put in memorizing it, which is even harder if we are not explained why this list is what it is. However, if we try to provide reasons, and since we have to differentiate between well-behaved and ill-behaved constructions in FOL, we need to provide a prior explanation of FOL. If such an explanation were semantic (i.e., by explaining the validity of arguments by means of models), we would defeat purpose; if such an explanation were syntactic, we would require to explain one of the cumbersome deductive systems of FOL. In both cases, the use of TS, enhanced with the list of well-behaved constructions, does not make it any easier to teach SFOL as compared to the learning of the standard model-theoretical account, and rather increases the amount of information to learn and memorize.

We have shown that TS requires a delimitation of the interpretations that can be used to provide truth-conditions for formulas in FOL. Without such a delimitation, TS is prone to logical error. However, the list providing such a delimitation is not exempt from controversy, and even if it were, the mastering of it would require additional work and thus would defeat purpose. Nevertheless, for the sake of the remaining two arguments, we are going to concede that such a list is feasible and conspicuous to use, and hence we are not going to dispute that it is not logically problematic to provide a TS in an attempt to explain SFOL. Even in this stronger position, we will show that TS does not explain what it purports to explain, and that it makes far-reaching, unjustified assumptions.

To bring this section to a close, we hasten to emphasize that we have not aimed our arguments against the very possibility of providing formal models of the semantics of natural language. The examples provided in this section are well-known arguments that show the limits of task (a) – i.e., the translation of sentences in NLinto formulas in FOL. Such examples show that this task requires logical tools that go well beyond FOL. What we have proposed so far is to adapt such arguments in order to bring out the initial limitations of task (b) – i.e., the provision of truth-

conditions to formulas in FOL by means of the use of NL. If this section shows anything is that FOL and NL do not fit quite well with each other, and therefore, if we are to relate them, it is necessary to restrict ourselves to the fragments of NL that – at least at first glance – do not give problems. As we have seen, such a restriction is not exempt from controversy and is not trivial, and nevertheless our critique so far has not been addressed to the very possibility of carrying out task (b). What we want to show now is the impropriety of TS by pointing out how it lacks the required explicitness when it comes to the elements composing the semantics of FOL, and by arguing that it incites, without reflection, the belief that NL has, at least, a fragment whose structure coincides with the structure of FOL. This is what we set out to show in the next two sections.

3. A Building with Papier-mâché Foundations

In this section and the next one we will argue that, even granting that we have a list of well-behaved constructions, it is not proper to use TS to teach SFOL. We start out from the observation that (13) and (14) are not the same thing:

(13) *Hs* is true iff Socrates is human.

(14) *Hs* is true in $M = < A, I >$ iff $I(s) \in I(H)$ (where $I(H) \subseteq A$).

In this section we will argue that (13) cannot be used to introduce (14); in the next section we will criticize the far-reaching assumption that (13) and (14) are structurally identical.

Let's look back at our example (3) and its representation in FOL, (4). The TS that connects them consists of, among others, the following rules:

(a) '*s*' represents Socrates.
(b) '*Hx*' represents that *x* has the property of being human.

The first thing to which we should draw our attention regarding (a) and (b) is that the expressions on the left-hand side of 'represents' do not have a meaning on their own, while the ones on the right-hand side do, since this is assumed in the practice under discussion – that is, they belong to the natural language that we are using to explain SFOL. The second thing to which we should draw our attention is that the use of language is not the same as the providing of an explanation of its own semantics. In other words, we are appealing to our prior understanding of some expressions in natural language in order to say something about the formal expressions, but we are not explaining what that prior understanding consists in. And from here we cannot reach the elements required in (14).

Another way of bringing the point home is the following: (a) says that '*s*' represents Socrates, but it does not explain the meaning of Socrates, let alone explain that '*s*' is to be interpreted as $I(s)$ – the same goes for (b). Any semantics that purports to explain the meaning of Socrates should appeal to at least three

elements: the name ('Socrates'), the person (the Greek philosopher), and a relation between them. All by itself, the name 'Socrates' does not give us the other two elements. When the name is not used (i.e., when it is mentioned), it gives us the first element. But when the name is used, it gives us only the second element.[8] Moreover, the relation between the two is utterly opaque and implicit.

What a SFOL should provide in the case of an individual constant such as '*s*' is a tripartite structure as described before. That is to say, it should give us marks, objects, and a link between the two. 'Socrates' by itself, even when used, does not provide any kind of tripartite structure, much less the tripartite structure that explains the interpretation of '*s*' required in (14).[9]

Thus, even though the expressions used in the right-hand side of the rules can provide (by way of stipulation) the meaning of the expressions in the left-hand side (which are devoid of meaning), the use of these expressions in the right- hand side is not able to provide an explanation of the meaning of individual constants and predicates. Thus, TS is not really a semantics, in as much as it does not provide the required tripartite structure.[10]

4. Counterfeit Money of Logic

So far we have criticized the practice of presenting SFOL by means of TS on the grounds that it is besieged by difficulties. In particular, in the previous section we have argued that TS (in the guise of (13)) cannot be used to teach SFOL (in the guise of (14)). However, an advocate of TS could argue that SFOL represents the extensional aspects of the semantics of natural language (SNL for short). This defense is based on the idea that a rule of a TS is a way to link the meaningless signs on its left-hand side with some aspect of the world, and that this link is formed by means of the use of NL (enriched with variables). To bring the point home, let's look again at (a) and (b) from section §3, repeated here for ease of reference:

(a) '*s*' represents Socrates.
(b) '*Hx*' represents that *x* has the property of being human.

They both are rules, so claims the advocate of TS, that link meaningless signs with some aspect of the world by means of the use of natural language: '*s*' is linked with the person Socrates by the use of his name; '*Hx*' is linked with all human beings by the use of the expression '*x* has the property of being human' in natural language (enriched with variables). Consequently, TS – i.e., the use of natural language to explain the truth-conditions of formulas in FOL – is for him quite acceptable. For instance, he maintains that when we use TS to explain the truth-conditions of '*Hs*', a clause such as (b) gives the extension of '*Hx*', namely the set of all *x* that are human beings. Thus, this practice is based upon the idea that FOL provides the extensional aspects of NL, insofar as both of them have semantics that designate the same referents for corresponding expressions ('*s*' and 'Socrates'; '*Hx*' and 'that *x* is

human'; etc.) – at least when it comes to well-behaved constructions. We will call this *idea the logical-core-of-language hypothesis*.

It is very important to bear in mind that our purpose in this section is not to criticize formal semantics – i.e., the study of SNL by means of logical tools. We do not want to provide empirical data that cannot be explained by such-and-such a theory (or by any theory of the formal kind). Rather, our target is the practice of teaching SFOL by means of NL. Even though what we argue in the sequel can give rise to a critique of formal semantics, to read our argument in this light would be to miss the point that we want to make here. What we want to argue is that the practice of TS incites an unwarranted link between SFOL and SNL and makes its practitioners prone to confusing two kinds of objects (i.e., SFOL and SNL). More precisely, we argue that the practice of presenting the relation between an object and a set to which it belongs (the '$\in$' relation) by means of an example such as 'Socrates is human' – compare our earlier claim that TS uses (13) to introduce (14) – does not make sense if we do not presume that such a mathematical relation is implicit in this natural language sentence. That is, a practitioner of TS assumes that 'Socrates is human' and '$I(s) \in I(H)$' have the same structure. Thus, even if the practitioner of TS – e.g., the author of a textbook or the professor giving this kind of presentation in a lecture – would not avow his or her agreement with this assumption – i.e., what we called the logical-core-of-language hypothesis –, the practice itself presupposes it.[11] Hence, many students, who are eager to absorb what is being presented to them as a distilled piece of knowledge, are led to believe such a hypothesis.

When the advocate of TS asserts that a formula in FOL, such as '*Hs*', is true iff Socrates is human, he is taking for granted that Socrates is human iff the entity Socrates belongs to the set of all human beings. Let's take a closer look at this assertion. The truth-conditions of '*Hs*' can be obtained from interpretation rules for '*s*' and '*Hx*' (rules (a) and (b) above). Now, rule (b) assumes that the referent of '*Hx*' is the same as that which is given to the expression '*x* has the property of being human' by means of its use in natural language (enriched with variables). Moreover, since the purpose is to explain SFOL, the advocate assumes that the referent of the expression '*x* has the property of being human', given to it by its use in natural language, *is a set in the mathematical sense. This is, by all means, an imposition on this natural language expression of far-reaching consequences*. We will criticize the imposition of the logical-core-of-language hypothesis on two accounts: in §4.1 we will argue that it is unjustified on the face of the actual body of knowledge about language; and in §4.2 we will show that it confuses two kinds of study.

4.1 The hypothesis is unjustified

The assumption that the referent of the expression '*x* has the property of being human', given to it by its use in natural language, is a set implies that this reference is: (i) a collection of things; (ii) something of a binary character – that is, for all

objects they either belong to the collection or not –; (iii) whether an object belongs to the collection or not does not depend on any kind of parameter – for instance, '*x* has the property of being human' applies to any human throughout history, past, present, and future; and (iv) there is a prior and fixed delimitation as to which objects belong to the collection – for instance, there is no doubt whether an imaginary human belongs to the collection or not (cf. our discussion about the predicate 'cat' in section 2). Such impositions clash with the fact that the body of knowledge about natural language is not yet consolidated, nor are there any warrants that it will consolidate around the logical-core-of-language hypothesis. Take (i) for instance. For some scholars, such as Frege and many others in the tradition of formal semantics, it is evident. But it is not so for some interpreters of Wittgenstein, such as Travis, and for all those who Recanati refers to as proponents of 'Meaning Eliminativism' (Recanati, 2003) – for it is their contention that to which things a predicate can be applied depends upon the interests of the participants. Thus, there is no consensus around there being the extension of a predicate as a set in the mathematical sense. Consequently, there is no consensus about (ii) either, inasmuch as the existence of binary predicates depends upon the existence of the extension of a predicate, of which we can say that objects belong to it or not in a binary way. Moreover, to assume (ii) means to take position against a great amount of literature in linguistics and cognitive science that goes under the umbrella term of 'Prototype theory', according to which lexical categories do not have clear borders (cf. Taylor, 2003; Rosch, 1975; Molesworth et al., 2005). As for (iii) and (iv), there are positions in the literature asserting that no predicate that is not an indexical requires any parameters; on the other hand, there is a diversity of positions adhering to different extents to the idea that the context and the speaker's intentions are required to determine the content of any predicate (Recanati, 2003).

The advocate of TS, when seeing himself forced to consider that (i)–(iv) are substantial impositions, could try to rebut the foregoing arguments by claiming that: (v) every predicate has an extension; (vi) the restriction to well-behaved constructions, inasmuch as their referential properties coincide with those of sets in the mathematical sense, avoids the need for making far-reaching suppositions about natural language; (vii) that the prior definition of a universe of discourse (UD) allows for an implicit role of the parameters in natural language – for instance, the extension of '*Hx*' can be made to depend upon any UD containing humans that are alive at the present moment; and (viii) that the prior definition of a UD allows for the consideration only of uncontroversial interpretations. Now, our reply is the expected one: (v)–(viii) are themselves far-reaching impositions upon natural language, regardless how plausible they may seem. To begin with, claim (v) only recasts the same position once again; one among many positions in the aforementioned debate. Claim (vi) presupposes (iii) and (iv) (but it is difficult to overcome qualms such as those discussed in section 2 about the predicate 'cat'). As for (vii), the advocate must assume that UD is a set in the mathematical sense, and hence UD also lacks parameters. Last but not least, (viii) presupposes that there are uncon-

troversial cases in NL and that we can build a semantics restricting our attention to them (but the qualms exposed in section 2 seem to deter the feasibility of this idea).

In the foregoing we have shown that the logical-core-of-language hypothesis rests on far-reaching suppositions about natural language. We have also shown that there is no consensus upon these suppositions. Moreover, in the contemporary scene in philosophy of language there is no consensus upon either the method of study or the object of study. For instance, not every scholar gives truth-conditions the same role in the study of natural language: Chomsky considers that meaning is a socio-cultural aspect of language which is not even part of linguistics; Wittgenstein (in *Philosophical Investigations*) seems to claim that meaning is use and that 'use' must be understood as a practice which is not reducible to individual intentions; and Heidegger (in *Being and Time*) claims that language is the form in which meanings, which are already present in day-to-day practices, are expressed (compare Dreyfus, 1991: 12). Even among the approaches to language for which truth-conditions are nuclear, there are at least eight different positions, differing on whether truth-conditions can be attributed to sentences or to their utterances (Recanati, 2003). There is no escape to the conclusion that the advocate of TS is projecting the properties of the mathematical tools underwriting SFOL onto thereferents of natural language expressions, and that he does not provide any justification to do so (and the burden of proof certainly falls on him).

At this point it is important to clarify our position so that we do not give the erroneous impression that what we are doing here is to criticize the translation of sentences in NL into formulas in FOL. Indeed, if this was what we were doing here, it would seem that our point is reduced to the claim that such translations are terribly simplified, since the semantics of NL exhibits complicated phenomena that lie beyond the scope of FOL. And since we are discussing introductory texts, simplification in the translations is not something to be avoided, but rather it seems to be the proper way to go about it, or so goes this misunderstanding of our position. Now, it is important to bear in mind that the object of our critique is the practice of presenting the truth-conditions of FOL by means of sentences in NL. The gist of our critique here is that this practice induces in the students the belief that NL possesses properties (i)–(iv) and that, in view that there is no clear and reasonable consensus about these properties, to promote such a belief about the relation between NL and FOL is to introduce a harmful bias in the fields of logic and in the study of language.[12]

We call the previous belief – i.e., that NL has properties (i)–(iv) – an implicit foundational belief of the practice of giving truth-conditions to formulas in FOL by means of sentences in NL. This means that students, in practicing it, would take it for granted that NL has such properties. In this way, they come to believe that it is superfluous to reflect and question about the properties of NL.

It is important to make a brief digression about what it means for this belief to be an implicit foundational belief of TS. To this effect, we need to provide a very simple analytical matrix to situate this belief in a practice. The matrix has two axes:

that the belief is implicit or not; and that it is foundational or not. Firstly, that the belief is implicit means that it is neither reflected upon nor presented when the practice is carried out. Secondly, that the belief is foundational means that a practitioner of the practice must assume that the belief is true without questioning or justification. Thus, the belief is an implicit foundational belief when the practice is carried out as if the hypothesis were true, and is never made explicit, not even for questioning or justification. The belief that NL has properties (i)–(iv) is an implicit foundational belief in the practice of using a TS in the explanation of SFOL.

Now, this belief can be an *explicit* foundational belief in a different practice. For instance, when in philosophical logic it is announced as a presupposition of logical analysis. (Compare the following statement by Borg and Lepore: "[t]o have any hope that a system of symbolic representation will work, we need to assume that natural language sentences *actually* possess some kind of formal structure on the basis of which we can project out the explanations of the inferential properties of novel linguistic items" (Borg and Lepore, 2002: 99, emphasis in the original).) Thus, the implicit or explicit character of this foundational belief depends upon the practice – it changes from implicit in TS to explicit in logical analysis.

But the belief in this hypothesis can also cease to be foundational when we move on to the methodological reflections of logical analysis, such as those of Carnap's and Quine's about 'explication' (Carnap, 1947, 1962; Quine, 1964), in which logical tools are not synonymous with some natural language expressions, but replace them. To sum up, the implicit or explicit character, as well as the foundational or non-foundational character of the belief in the logical-core-of-language hypothesis, depends upon the practice.

To bring this subsection to a close, we want to emphasize again that the gist of our critique is not that, in teaching logic by means of TS, we are teaching too simple a tool for the task of translating NL into FOL. This, of course, could be solved by teaching more powerful tools. Rather, the problem is that, in teaching logic by means of TS, we are introducing a bias in our understanding of NL. In the next subsection we will argue that this bias has the problem of hiding the difference between two kinds of study.

4.2 The hypothesis is confused

There is an aspect to this hypothesis that is even more problematic, namely, that it confuses two different kinds of study: the study of SFOL and that of SNL. The difference that we want to emphasize can be brought out by means of the following analogy with other kinds of studies. Consider the study of the Cathedral of Cologne and the study of the emergence of prices in a free market. To confuse these two studies would be like to suppose that a cathedral can be understood as the result of either an action of nature or as the complex but anarchic confluence of many individual actions, on the one hand; or that the emergence of prices in a free market can be studied by means of criteria such as the cultural influences, the technical abilities and the purpose of a designer, on the other hand. *Mutatis mutandis*, the

study of SFOL is like the study of the Cathedral of Cologne, inasmuch as SFOL is an object-of-design; the study of SNL is like the study of the emergence of prices in a free market, inasmuch as it is complex and anarchic an object. The confusion produced by the use of TS under the logical-core-of-language hypothesis is that the study of natural language is confused with the study of logic. This confusion makes the study of SNL seem akin to the study of the artifacts of Model Theory, which are used in the construction of SFOL. Such artifacts, which come from Set Theory, were originally designed to address worries about the foundations of mathematics. But as it is known by any architect, it is one thing to design the foundations of something, and quite another to discover the foundations of something. SFOL is an artifact designed with a purpose, which is absent in natural language – natural language per se does not have a purpose, even if it can be used with one. There is no way around the conclusion that the studies of SFOL and SNL are of a different kind, since their objects of study are of a different nature.

Now, even if SNL and SFOL were structurally identical – and thus the hypothesis were true–, the discovery of such a truth requires two different studies: the empirical study of natural language and the mathematical study of Model Theory. Only on the basis of the results of both studies can we compare SNL and SFOL in order to assert that they are indeed identical. Thereby, both studies need to be of a different kind even regardless our assumption of the structural identity of their object of study. To confuse both kinds of study in this case is like to take counterfeit money as if it were authentic, just because we cannot distinguish a good counterfeit – which imitates every detail – from the legitimate note. But without knowing from where they come from, we cannot distinguish them with certainty. In like manner, the two semantics demand a different kind of study, in virtue of their coming from different places, namely, everyday life vs. the design made by philosophers and mathematicians. We can even say that their coming from different places makes them objects of different nature. To bring this line of argument to a close, suppose further that there is indeed a consolidated body of knowledge about natural language, and that this indicates that SNL coincides with SFOL. Even in this case we maintain that the two studies are of a different kind. For any advance in our knowledge of SFOL, say a new theorem that is proved, is not by itself an advance in our knowledge of SNL. We would need to map these results from one study to the other, and to this effect we require two different kinds of studies.

TS is a practice in which the logical-core-of-language hypothesis features as an implicit foundational belief. It assumes, for instance, that 'Socrates is human' and '$I(s) \in I(H)$' have the same structure, and does so unreflectively and without justification. It comes as no surprise that the comparison between the empirical study of natural language and the mathematical study of Model Theory is conspicuously absent from the textbooks that promote TS. They promote a practice that confuses the empirical study of the semantics of 'Socrates is human' and the theoretical study of '$I(s) \in I(H)$'. This a methodological confusion that should not be disseminated.

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We have argued that the practice of teaching the truth-conditions of first-order logic by means of natural language – what we have called translational semantics – has detrimental consequences for understanding the semantics of first-order logic. In fact, it turns out to be necessary to restrict the constructions in natural language that can be used in the formulation of truth-conditions, in order not to invalidate logical laws. But even if this restriction were feasible, which we argue is not, the clauses that connect formal language with natural language (say '*Hs*' is true iff Socrates is human) do not explain the semantics of first-order logic. In other words, the practice of translational semantics is not an explanation of the semantics of first-order logic. Even if some of its practitioners believe that there are advantages in the use of translational semantics, that such advantages overweight the problems it causes is something that should be actively defended, and not just taken for granted as part of the way this business usually goes. More seriously, an implicit foundational hypothesis of this practice is that (parts of) natural language and first-order logic share a structure. This hypothesis is unjustified and controversial, and it incites the misconception that, when we study the semantics of first-order logic, we are unearthing it from the semantics of natural language – this a methodological confusion that should not be disseminated.

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NOTES

1. We wrote several alternatives for the relation between symbols in first-order logic and expressions in natural language ('is translated as/means/stands for') because there is no agreed upon concept to use when it comes to the connection between natural language and formal language. There are other options, including 'represents', 'formalizes', 'models', 'is interpreted by', etc. In the sequel we will mostly use 'represents' and 'is interpreted by', but the reader should bear in mind that there are several alternatives that could be used, and that there is no agreed upon concept for this relation. Note in passing that there is no noticeable effort in these textbooks to distinguish the different ways of relating the constructions in natural language with the formal constructions of logic. For instance, one thing is to claim that a sentence *x* is translated for a sentence *y*, and another is to claim that *y* interprets *x*, or that *y* represents *x*, or that *y* is a formalization of *x*.

2. It is worth mentioning that the characteristics of this transformation are obscure, for what is the relation between the input of the process (i.e. a natural language sentence) and its output (a first-order formula)? What is changed and what preserved by this process? Quine is not explicit about this issue and only mentions in passing that this is an abstraction process.

3. This makes this presentation found in the first five editions of *The Logic Book* a paradigmatic example of a TS, even more than Carnap's semantical systems. Carnap does not define the metatheoretical concepts of logic by means of his rules of truth, but by means of his state descriptions. Nonetheless, Carnap uses his rules of truth to explicate concepts such as contingent truth.

4. Compare (2) with the truth-conditions obtained from a Carnapian semantical system.

5. Despite the fact that there is no conventionally accepted standard rule-based procedure, there is a de facto agreement on the outline of such a process, which mostly consists in convenient replacements that end up in a logical construction aptly suited for drawing the inferential relations of relevance for the initial argument in natural language.

6. We are aware that some philosophers would disagree with calling an argument in NL valid, because they would prefer to restrict the use of such a term to the formal languages used in logic. We agree with this qualification, since the discussion whether the entailment that we find in NL is a genuine logical consequence relation is still open (cf. Glanzberg, 2015).

7. This would be the case if we thought that 'cat' was a natural kind.

8. And if we favored a causal-historical theory of reference, it would not even be clear what the use of a name would give us, since it would be based on a process of 'reference borrowing'.

9. On a more technical note, it could be argued that another reason why (13) cannot be used to explain (14) is that the former provides absolute truth-conditions whereas the latter establishes truth-conditions that are relative to a model (cf. Glanzberg 2015, in particular §II.1.1; Higginbotham 1988; Lepore 1983). Such a critique can be addressed to some versions of TS, such as, arguably, Carnap's and Quine's (cf. §1 above). However, there are versions of TS, such as the one we find in Bergmann et al. (2013) and in Páez (2007), that emphasize that the specification of truth-conditions must begin with a universe of discourse. Thus, such versions of TS provide truth-conditions relative to a model and, therefore, we cannot use the difference between an absolute and a relative semantics in (13) and (14) in order to criticize them.

10. In this section we have criticized the idea that the use of sentences in NL explains the semantics of SFOL. It is a presupposition of this idea that the student can rely on his or her own understanding of NL in the task of interpreting SFOL. Thus, sentences in NL are supposed to be endowed with unambiguous meanings that can be fruitfully exploited. But sentences in NL stand in need of interpretation, and recent research has shown that, even in mathematical environments, students can interpret sentences in different ways. Some interpretations hinder and some facilitate an appropriate use of NL sentences in mathematical proofs (cf. Dawkins, 2017; Dawkins and Cook, 2017). For instance, the evaluation of the truth value of the sentence 'Given any quadrilateral, it is a square or it is not a rectangle', is influenced by the way in which students represent the predicates 'quadrilateral', 'square', 'rectangle'. On the one hand, interpretations based on exemplars (or prototypes) hinder the proper normative analysis of the statement; on the other hand, interpretations relying on set-based meanings expedite the normative analysis of the truth value (Dawkins, 2017).

Dawkins and Cook (2017) suggest that set-based meanings emerge from the students' engagement in proof-oriented practices in mathematics. This is an interesting line of research, and one that could improve the teaching of the semantics of FOL, but in this text it should remain as a suggestion for future work.

11. We do not discard that some philosophers may have a hidden agenda that explicitly adheres to such a hypothesis. However, our argument does not depend on the intentions of the practitioners of this practice, but on the presuppositions of this practice itself.

12. We would like to quote Steward Shapiro who, in some recent reflections about the role of mathematics in philosophy, says that: "We philosophers were bequeathed a powerful batch of tools: model theory, proof theory, set theory, recursion theory, you name it. It is natural for us to hold that everything we encounter will yield to those tools, and be enlightened thereby" (Shapiro, 2016: 5). We think that improper practices such as TS are responsible for the fact that philosophers feel that it is natural to think in this way. But this is not what a good education in philosophy should provide. Shapiro equals this wrong way of thinking with a "child who is given a hammer for her birthday. As she goes around the house, she discovers, to her delight (and her parents consternation), that everything she encounters is in need of hammering. [...] Perhaps we should keep in mind that there may be important mismatches between mathematical languages, especially how they are regimented in logic, and the rough and ready world of ordinary thought or even scientific thought. It may be that things are not as determinate and clear as the mathematics for which our cherished tools were developed" (idem). Nevertheless, our point has wider scope than Shapiro's, since our worries go beyond the mismatch between mathematics and natural language. We also consider the confusion between two different kinds of inquiries about two different kinds of realms and the nature of their constituent elements (cf. §4.2 below).

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EXPRESSIVE CONTENT AND SPEAKER-DEPENDENCE

GRAHAM STEVENS
graham.p.stevens@manchester.ac.uk
Philosophy/School of Social Sciences,
The University of Manchester, England
(corresponding author)
NATHAN DUCKETT
Philosophy/School of Social Sciences,
The University of Manchester, England

ABSTRACT. Expressives are lexical items which encode attitudes. Original semantic theories for expressives assumed that this attitude was always the speaker's, however, a number of apparent counter-examples have motived recent theorists to endorse the view that expressives can be shifted to non-speaker-oriented readings under which they express attitudes of a salient *judge*, distinct from the speaker. We argue that this rejection of speaker dependence for expressives is too hasty, arguing that: (1) the counter-examples are unconvincing, and (2) reflection on other puzzling uses of expressives that we introduce here suggest that speaker dependence ought to be preserved as a universal semantic feature of expressive content. Apparent cases of perspective shifting, we argue, are best understood as resulting from pragmatic, rather than semantic, operations.

Keywords: expressive content; speaker dependence; pragmatic operation

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1. Expressives

Expressives are lexical items which encode attitudes. Mary says: "That bastard John stole my pen." According to many semantic theories for expressives[1] the way to understand such sentences is by isolating two distinct levels of information[2] encoded by the utterance, for instance:
(1) John stole Mary's pen.
(2) Mary has a negative attitude towards John.

It seems that (1) captures the truth-conditional, or propositional, content while (2) goes some way towards capturing whatever meaning is introduced by the expressive "bastard." On the face of things this is an attitude held towards John by the speaker. Similar locutions can express other attitudes. E.g. (among others):
I. *Expressive Interjections*: for instance: "ouch!," "yippee!," "damn," and "yuck."
II. *Epithets*: for instance: "my dear," and "your honour," derogatory epithets such as "idiot," and racial pejoratives.

It is tempting to suspect that this speaker dependence (SD) is a universal feature of expressives:
(SD) Expressive content is always evaluated from the perspective of the speaker. It is the speaker's attitudes that the expressive locution conveys.[3]

Hence, according to SD, whenever one comes across a term such as "bastard" it is a feature of the content of these expressions that they can only encode the attitudes of *speakers*. As such, (SD) predicts that expressives will typically resist embedding under propositional attitude reports, verbs of saying, etc. (cf. Kaplan, 1999: 8): that is to say, the expressive content of an expressive always occupies wide scope position with respect to propositional attitude operators. For example, John's utterance of the sentence "Jane believes that bastard James is a decent man" expresses John's disdain for James, not Jane's.

Upon further reflection, however, there seem to be counterexamples to SD. Some have already been mentioned in the literature. Additionally, in what follows we shall offer two more. From such data, Potts (2007: 166) replaces SD with PD (Perspective Dependence):
(PD) Expressive content is evaluated from a particular perspective. In general, the perspective is the speaker's, but there can be deviations if conditions are right.

PD is captured in Potts's semantic theory by the addition of a *judge* parameter, as first introduced by Lasersohn's (2005) semantics for predicates of personal taste. What PD facilitates is the use of an expressive to encode the attitude of the judge, rather than the speaker. The default setting for the judge parameter is that it takes the same value as the agent or speaker parameter but, under special circumstances, these two parametric settings can differ, allowing speakers to express the attitudes of perspectives distinct from their own. However, there is an important difference in the way that Potts makes use of the notion of a judge compared to the treatment offered by Lasersohn. Lasersohn appeals to a judge parameter in order to defend the thesis that the very same proposition can have different truth-values relative to distinct judges. Hence the judge parameter is not an element of the context of utterance in Lasersohn's theory, as this would make the *content* of an utterance dependent on a judge, rather than the truth-value that the proposition has. Thus judges are parameters of the circumstance of evaluation according to which propositions are evaluated as true or false. For Potts, however, judges are elements of context and the proposition expressed is dependent on the value of the judge

parameter. The addition of the judge into the context therefore allows a shift in the perspective encoded by the expressive away from the speaker, hence the theoretical shift from SD to PD.

Despite the proposed counter-examples, we do not think SD should be rejected. In this paper we argue for two things:
(a) *A rejection of Potts' proposed solution to the counterexamples*. For while we accept that this solution may work for CE1–3, it will not work for CE4–5, and in fact makes the wrong predictions about expressive content in these cases.
(b) *A denial that CE1–5 really are counterexamples to SD.* We argue that the troublesome status of CE1–5 is in fact consistent with SD, and can be dealt with without the complications that Potts envisages.

We thus defend the status of SD as a universal semantic principle for expressives, offering an analysis of apparent deviations from the principle that is able to preserve a greater degree of simplicity than that found in its rivals.[4]

2. Counterexamples to SD

SD is a *semantic* claim about expressives. More precisely, it is a claim about their *character*, where "character" is understood, roughly, as a rule for the use or interpretation of a given locution in a context.[5] SD makes it impossible to force an expressive to encode an attitude that the speaker does not hold (or at least purport to hold by the way they speak) without recourse to metalinguistic operations such as quotation.

Understood in this light, SD predicts that the only cases where one who utters an expressive locution does *not* thereby express their own attitude are quotational contexts, or can plausibly be analysed as such.[6] SD, then, proposes a direct analogy with indexical expressions such as "I," at least as according to their behaviour in English. Kaplan (1977: 510–511) argues that the only environments where the referent of "I" shifts to someone other than the speaker are quotational contexts:
(3) (a) Otto said that I am a fool.
("I" denotes speaker)
(b) Otto said "I am a fool."
("I" denotes Otto)

The same also holds, if SD is accepted, for expressives:
(4) (a) Mary said that that bastard John stole my pen.
("bastard" encodes speaker attitude)
(b) Mary said "That bastard John stole my pen."
("bastard" encodes Mary's attitude)

Recent literature, however, has proposed a number of counterexamples to this view. We consider three such examples:[7]

First Counterexample: Kratzer (1999)
(CE1) My father screamed that he would never allow me to marry that bastard Webster.

Intuitively, it would be strange for a prospective spouse to denote their future husband by the expression "that bastard." Hence, the thought goes, whereas "me" is indeed indexed to the speaker, it must be that "that bastard" does not in fact encode the speaker's attitudes at all. Rather, it seems that "that bastard" encodes the attitude of the father.

Second Counterexample: Schlenker (2003)
(CE2a) *I am not prejudiced against Caucasians. But if I were, you would be the worst honky I know.
(CE2b) I am not prejudiced against Caucasians. But John, who is, thinks/claims that you are the worst honky he knows.

According to SD, racial pejoratives, *qua* expressives, should not embed under any operation short of quotation. Yet in (CE2b) this is precisely what appears to be the case. For, if "honky" scoped out from the propositional attitude verb "thinks/claims" the result should be a contradiction as in (CE2a), where the speaker simultaneously disavows a negative attitude towards Caucasians and uses an expression which is felicitously used if and only if they have just such an attitude. Thus, the thought goes, "honky" must connote John's attitude, and not the speaker's, in direct violation of SD.

Third Counterexample: Potts (2007)
(CE3) A CPJ report on Venezuela tells us how problems have "escalated" in Venezuela under Chavez, i.e. the physical attacks against journalists under previous presidents have "escalated" to Chavez calling the opposition, which includes the media, names. This is very, very serious, but I don't think another coup attempt is called for until Chavez resorts to dramatic irony or sarcasm. But if that vicious bastard uses litotes, then there's no other rational choice than an immediate invasion.

Pace SD, the context of (CE3) is such that it is incorrect to think of "that vicious bastard" as connoting the weblog writer's attitude. Rather it seems to be the attitude of someone else. Commenting on this passage, Potts (2007: 175) says that the weblog writer's: "…general level of sarcasm is sufficiently high to shift the content of that vicious bastard away from her and onto her opponents (the authors of the CPJ report, of which she is sceptical)."

The above counterexamples are already familiar from the literature on expressives. Nevertheless we shall argue in what follows that they are open to certain obvious replies, and in this respect are deficient. To compensate, we offer two additional counterexamples of our own, which we do not think are so easily diverted:

Fourth Counterexample: The following passage is taken from Terry Pratchett's *Making Money* (2007: 307):

(CE4) She had the slightly wistful, slightly hungry look that so many women of a certain age wore when they'd decided to trust in Gods because of the absolute impossibility of continuing to trust in men. […]

'What is your name, shister?' he asked.

'Berenice,' she said 'Berenice, er, Houser.'

Ah, no longer using the bastard's name, very wise, thought Cribbins.

Cribbins does not know Berenice's ex-husband, but has deduced from her manner that she is a divorcée. In this case, one might have expected his use of "the bastard" to be infelicitous, or at least inappropriate: for, were it really the case that "Bastard" could only express speaker attitudes, Cribbins should not be able to express a negative attitude towards someone he knows nothing about. But, rather, it seems that his use is felicitious precisely because SD fails: the attitude expressed by *his* use of "the bastard" is attributed to *Berenice*.

Fifth Counterexample

The final counterexample envisages a conversation between two individuals. Call them A and B:

(CE5) A. I just had to spend £500 on a new clutch for my car

B. Ouch!

Assume that B is not subject to any unmentioned source of pain, discomfort, etc., during this dialogue. Given SD, her utterance should be infelicitous. But such dialogues are commonplace. B seems, contrary to SD, to use "Ouch!" to convey a state or attitude of A's.[8]

For SD to be acceptable it must be able to provide a solution to all of the above counterexamples CE1–5. Of course, the same requirement applies to alternative to SD, such as PD put forward by Potts. In the next section we describe this latter approach in more detail. We shall try to show that this proposal, while perhaps accounting for CE1–3 (though with reservations), nevertheless fails for CE4–5. By contrast, we shall try to show that all five counterexamples can be explained while holding SD intact.

3. Responses

If these counterexamples are genuine then they need a solution. One influential proposal, offered by Potts, proceeds by weakening SD, thereby generating a new principle he dubs *perspective dependence (PD)*. Recall the formulation from Potts (2007: 166) given above:

> *Perspective dependence:* Expressive content is evaluated from a particular perspective. In general, the perspective is the speaker's, but there can be deviations if conditions are right.

To see why PD is weaker than SD, consider any of the counterexamples we have outlined above. Unlike SD, there is no longer any restriction that the expressed attitude need be the speakers. Therefore the usages introduced in these counter-examples, where the speaker appears to be conveying another person's attitude and not their own, is accounted for by saying that the perspective has shifted away from the speaker – the person that we would normally expect to be the holder of the attitude expressed – to some other individual recoverable from the context.

To effect this move, Potts (2007) draws on earlier work in relativist semantics, and in particular the work of Peter Lasersohn.[9] Potts's proposal is that expressive utterances should be modelled by an ordered pair $<s,c>$ of the sentence uttered s with a context of utterance c, which is a series of parameters $c = <a_c, l_c, t_c, w_c, j_c, \varepsilon_c>$, such that a_c is the *agent* of c, l_c is the *location* of c, t_c is the *time* of c, and w_c is the *world* of c. So far, this is familiar to students of indexical semantics (e.g. Kaplan, 1977).[10] The innovation comes from the addition of a *judge* parameter j_c and expressive index ε_c. It is j_c which motivates the move from SD to PD. The addition of this parameter allows the content of elements within the utterance to be determined by the attitude of a judge distinct from the agent (speaker) of the utterance.

Originally Lasersohn (2005) proposed the introduction of a judge parameter into the sequence of parameters that propositions are semantically evaluated with respect to in order to explain the apparent relativity of truth-value that he argues are found in judgements of taste. This relativity is made evident, Lasersohn argues, by so-called *faultless disagreement* – a phrase used to describe our intuition that there is no objective matter of fact which can decide disagreements in personal taste. Following Kaplan (1989), it is common in formal semantics to distinguish two levels of indexing: the *context of utterance* is a sequence of parameters which must be determined before a sentence can express a content. For example, indexical expressions require these parameters. Once these parameters have been fixed, we can evaluate the resulting proposition relative a further sequence of parameters, the *circumstance of evaluation*. Minimally, this sequence will contain a world and a time, but there is no formal obstacle to extending the sequence. Lasersohn's proposal is that faultless disagreement is most naturally explained by adding a judge parameter to the circumstance of evaluation. Consider two conversations between A and B:

(5) A. Bill missed his seminar presentation this morning.
B. Bill didn't miss his seminar presentation this morning.

(6) A. Presenting at seminars is fun.
B. Presenting at seminars isn't fun.

It would appear that there is a key difference between conversation (6) and conversation (5). Assuming that both utterances are paired to contexts which take the same value for "this morning," it does not seem possible for both (5A) and (5B) to be true. Either A or B must be factually mistaken. The same thing does not go for (6) however; because it is a subjective matter whether presenting at seminars is fun,

(6A) and (6B) can be both true. A and B are disagreeing but neither is at fault:[11] B is able to contradict A in (6) without us having to infer that either A's statement or B's statement is false. This is explained within Lasersohn's semantic theory, because the two assertions are each evaluated with respect to a different judge (namely each speaker is the judge of her own utterance in this scenario). Potts adopts the notion of a judge parameter to account for the failure of SD in the above kinds of cases by taking them to be cases were the expressives encode the attitude of a judge who is distinct from the agent of the utterance. Furthermore, he appeals to Lasersohn's analysis of judgements of taste (Potts, 2007: 175) to argue that the inclusion of the judge parameter is independently motivated, hence not an *ad hoc* fix to the counter-examples. As noted above, however, Potts can only achieve the desired result here by making an important departure from Lasersohn's theory. Judges do not influence the content of utterances on Lasersohn's theory, they simply mediate over the correct evaluation of the content. This is indeed crucial to the notion of faultless disagreement: if different judges result in A and B meaning different things in the above examples, then there is no genuine disagreement between them and, *a fortiori*, no *faultless* disagreement between them – they are simply "talking past one another," B negating a proposition which turns out to be distinct from that which A asserts. The claim that the addition of judge parameters within the context of utterance is independently motivated by Lasersohn's account, therefore, is incorrect. Lasersohn's theory may provide independent reason for the notion of a judge parameter as a semantic concept, but it gives no independent reason for thinking that the concept is required for fixing the *content* of an utterance, which is what it is being invoked to do on Potts's account.

We think that the appeal to a contextual judge to explain the counter-examples is problematic for a number of further reasons even if one is willing to overlook the distinction between context and circumstance. CE1–CE3 do seem to involve a shift from the agent perspective to the perspective of a salient other as the holder of the attitude relevant to the use of the expressive (although we will shortly argue that this appearance is deceptive). However, there seems to be more than this at play in CE4 and CE5. A notable feature of these two cases is the "empathetic" quality of the speaker's use of the expressive to show some form of emotional or evaluative affinity with another salient individual. We suggest that the use of the expressive in these cases is felicitous only if the *agent* possesses a certain attitude towards this salient third party. Thus, rather than contradicting SD, they both appear to make the attitude of the speaker fundamental to the interpretation of the utterance (albeit in a different way to the standard, non-empathetic, uses of the expressives). Taking as an example the case of CE5: just as an appropriate or genuine use of "ouch" in standard – i.e. non-empathetic – uses requires the agent to experience some kind of pain or discomfort (see Kaplan, 2005) so an empathetic use of "ouch" requires the *agent* to hold the correct attitude (that of empathy) towards the object of their empathy if it is to be genuine. But it is in this respect that we see trouble for an

account which abandons SD in favour of PD: we do not see how PD will be able to properly account for this attitudinal component in empathetic uses of expressives.

To see why we think an appropriate *agential* attitude is needed, rather than a contextually supplied judge, suppose that the judge of CE5 is indeed distinct from the agent. But then on the suggested analysis B's utterance of "ouch" could be appropriate in a case where B is glad that A has suffered the financial misfortune in question, or in a case where B deems the expense in question to be quite minor and an appropriate outlay for the new clutch, so long as the contextually determined judge herself has the attitude that she has suffered a financial misfortune and is upset about it. We find this counter to our intuitions. Secondly, note that B's utterance of "ouch" can be appropriate in cases where A does not hold the attitude standardly encoded by the term. Consider the following exchange:
A: I have just had to pay £500 for a new clutch.
B: Ouch!
A: It's OK, I won £100,000 on the lottery last week.
B: I still think £500 is extortionate.

Assuming once again that B is not in any pain of any kind, B's first utterance appears to be an empathetic use of the expressive "ouch." But then, if it is an empathetic use, by PD's lights, the appropriate judge here ought to be A. On the other hand, B's utterance seems to be appropriate here, not because of any attitude that A holds, *but because B thinks that £500 is a lot of money to spend on a clutch*. Taking A to be the parametric setting for the judge part of the context will not secure this result.

It is worth noting that there are important restraints placed on situations in which empathetic uses are felicitous that demand the preservation of SD and therefore are not explained by the relativist account. Consider the case where A is torturing B: if A inflicts pain on B and then says "ouch," this would be a bizarre and, we think, infelicitous utterance on the part of A.[12] Similarly, if A deliberately trips B over and then says "oops," there are a number of possible interpretations of the situation, but none of them are really interpretations on which A is expressing B's misfortune. It might, for example, be the case that A is expressing their own clumsiness in which case this is not an empathetic use at all, and certainly not a violation of SD. Or it could be that A is attempting to disguise their malevolence towards B by pretending the deliberate action was accidental, in which case this is a *mock* empathetic use, expressing A's mock empathy towards B. Similarly, perhaps A's utterance could be sarcastic but, as we argued in relation to CE3 above, sarcasm is best construed as a pragmatically introduced phenomenon, not a semantically encoded one. The restriction on empathetic uses is thus very clear – an empathetic use of an expressive is appropriate when and only when the speaker wishes to express a certain attitude that *they* have towards a contextually salient individual's situation. This is why we think a correct account of empathetic uses of expressives should preserve SD, as the speaker's perspective plays an ineliminable semantic role in such uses.

Our claim then is that PD makes the wrong predictions in the case of CE4–5. Now consider CE1–3: while PD does not seemingly make false predictions here we remain unconvinced that they are genuine counter-examples to SD at all, for reasons we shall now elucidate.

Let us start with CE1. In our view, this is simply a case of a metalinguistic operation on the expressive. Although there is no explicit quotation, the verb of saying "screamed" serves to generate what we will call a *quasi-quotational* environment. A quasi-quotational environment is contextually situated expression where the context generates a natural reading of the expression as quotational despite the absence of explicit quotation. In CE1, such an environment is generated by "screamed" in which the expressive is (with some pragmatic assistance from the context – namely the contextual obstacles blocking an interpretation of the expressive as transparently used by the speaker as they clearly don't think Webster is a bastard) construed as quoted. This is evident from the fact that the truth of the utterance here is dependent on the exact form of words used by the speaker's father: if he called Webster an "idiot," then the utterance will be false. Further confirming evidence of this hypothesis can be found by considering cases where the quasi-quotational environment is a cross-linguistic one. Consider Mary's report to her English-speaking friends of her French speaking Father's objection to her proposed marriage to Webster:

(7) My Father screamed that he would never let me marry that *connard* Webster.

The truth of this utterance again depends on the particular pejorative used by Mary's father. The fact that we can insert the French pejorative into the context of an English sentence is evidence of a quotational context, on a par with other cases of "mixed quotation" widely discussed in the literature (see e.g. Cappelen and Lepore, 1997; Maier, 2016). Mary cannot, for example, report her father's outburst by using the Chinese expression "*hundan*" in the same context, despite the fact that her English-speaking audience have no less an understanding of Chinese than French (the "?" is used to mark this kind of infelicity within a context):

(7a)? My Father screamed that he would never let me marry that *hundan* Brian.

CE2 seems to us to be the weakest objection of all. For one thing, it seems highly dubious that (5) is felicitous at all. We suspect that the apparent felicity of the example is a function of the relatively mild racial pejorative used in the example. Examples using more politically explosive terms are likely to provoke somewhat different reactions. Again, we suspect that the reading CE2 is intended to highlight is a quasi-quotational one.

Similar arguments to those we considered regarding CE1 seem to apply here, but not quite so straightforwardly: although John need not have used the expression in question to talk about the addressee of the utterance, it has to be the sort of expression that John *would* use. For example, it is not felicitous to substitute for "honkey" a term that John is unfamiliar with. The term has to be one that there is a

good justification for thinking John would himself use. Again this is strongly suggestive of a metalinguistic operation of the sort evident in CE1.[13]

We think, therefore, that there are only two ways to respond to counter-example 2: either it is not felicitous at all; or, if it is felicitous, it is also a quasi-quotational case.

This leaves us with CE3. We find it puzzling that Potts himself recognizes this use of the expressive as coming about via sarcasm, yet still holds that accounting for such cases requires us to modify the semantics of expressives. By contrast, we maintain that CE3 *is* very straightforwardly a case of sarcasm, and moreover can be dealt with using purely metalinguistic operations. For, just as with CE2, there are constraints on the terms that may be used in cases of sarcasm, as they have to echo the sorts of terms that we envisage the target speaker employing. However, there are differences. In particular, sarcasm often involves an element of hyperbole which allows us to exaggerate the echoic quasi-quotation to the level of a kind of mock-quotation:[14] sarcasm allows us to mock the speech of others and this means that we are not limited by the same constrains as we found in the quasi-quotational operations evident in CE1 and CE2. For example it may be that the authors of the CJP report would not use the expression "vicious bastard" but it is nonetheless licensed in the sarcastic context. The bottom line here, though, is that it is uncontroversial that sarcasm is best explained by pragmatic processes, not semantic ones.[15]

We have argued in this section firstly that some of the counter-examples to SD cannot be fully explained by the appeal to a judge parameter, and secondly, that those which can need not be, because there is no real reason to think they are genuine counter-examples to SD after all. This leaves us requiring an explanation of what is happening in those cases (namely CE4–5) that we so far have provided no solution for. We turn to that issue in the next section.

4. Empathetic Expressives

In the previous section we have established two things: (1) that the original motivation for PD (specifically CE1–3) is not in fact a counterexample to SD at all; (2) further examples that do apparently challenge SD (namely CE4 and CE5) cannot be explained by appeal to PD. In this section we will argue that CE1–5 can all be explained without rejection of SD. To do this, we will now show that CE4 and CE5 do not refute SD.

Our strategy for dealing with CE1–CE3 was to interpret them as subject to pragmatically introduced metalinguistic operations. All of them were argued to be quasi-quotational (albeit with the added complication of sarcasm-induced effects in CE3). Our suggestion is that a similar approach will explain CE4–CE5 also. However, there are important differences between CE1–CE3 and CE4–CE5 that must be taken into account and which require a more sophisticated analysis. No verbs of saying are present in these examples nor can they be plausibly paraphrased in terms of such constructions. This much is evidenced by the fact that the properties

highlighted in the other examples suggesting the presence of an implicit quotation operation are absent in these cases. Consider CE5: B's response to A's reported outlay for the new clutch in CE5 is not subject to the same kinds of restriction on the appropriate expressions employed that we saw with CE1 and CE2. Indeed, it is perfectly appropriate for B to use an expression unfamiliar to A, or even one wholly absent from As idiolect. If A is a monolingual English speaker, and B is a native Mandarin Chinese speaker who speaks English as a second language, then B may appropriately say "*ei yo!*" in response to a report of the financial transaction given by A in English. The fact that A does not speak Chinese, and therefore does not understand B's utterance, does not make B's interjection infelicitous.

What this difference reveals, however, is not the absence of a similar metalinguistic operator. It simply shows that the form of quotation differs. The key difference between CE1–CE3 and examples like out CE4 and CE5 is that the former, but not the latter, are all *reports* of another agent/speaker's attitude. CE4 and CE5 are what we call "empathetic" expressives. They do not report or encode the attitudes of others (as is the case in CE1–CE3). Rather they express *the speaker's* empathy with the situation of others.

Our suggestion is that all the cases, despite these differences, are best understood as resulting from a metalinguistic operation whereby the expressive is interpreted as implicitly quotational. However, there are two important aspects to this operation that must be recognized. Firstly, the type of quotation on display here is what is often referred to as *open quotation*. Open quotation is a mixed form of quotation which is a hybrid of use and mention. It mentions material from another context (standardly a reported context), but also endorses the content of the quotation, thus *using* it as well as *mentioning* it. Mixed forms of quotation have been noted often. A famous example from Davidon (1979) is:

(8) Quine said that quotation "has a certain anomalous feature."

Here, the speaker does not just report (mention) what Quine said, but also uses the very words Quine said to communicate the information that quotation has a certain anomalous feature.

As Recanati (2010) explores in some detail, an important, but often neglected, feature of open quotation is that it is used routinely to effect a form of linguistic mimicry. We quote the exact words of someone when reporting their speech in order to enter into a form of pretence where we perform an (often mocking) impression of the reportee:

(9) Now it seems that Donald Trump is the best of friends with Little Rocket Man.

In (9) there are enough contextual cues to make it clear that the expression "Little Rocket Man" is mimicking Trump (the main contextual cue that the interpretation relies on being the shared knowledge that "Little Rocket Man" is Trump's nickname for Kim Jong-Un. One who lacks this information cannot interpret the utterance as intended). Evidently, the expression is best interpreted as implicitly quotational. Making the mimicry of Trump explicit requires us to make the quotation explicit:

(9*) Now it seems that Donald Trump is the best of friends with "Little Rocket Man."

In a sense, there is a context-shifting operation at work here. However, there is no need to postulate any semantic operator to carry the burden of that operation.[16] Once we recognize that the best available interpretation of the utterance is implicitly quotational it's context-shifting properties are just what we ought to predict, as we saw in 3(b) above. The heavy context dependence of the interpretation, we suggest, is an indication that it is pragmatically licensed, rather than the product of a semantic operator. The same sort of contextual cues that shift the nickname in (9*) can shift expressives too. Consider the case of racial pejoratives. These take wide scope readings by default and there are no semantic operators that can force them into narrow scope. If a speaker offers an unquoted attitude report of another, using a racial pejorative, the racism expressed by the pejorative incriminates the speaker, not the person whose speech is reported. Reporting someone's speech using direct quotation, however, forces the content – including the expressive content of the pejorative – into narrow scope:
(10a) Mary believes that there are too many Honkies living around here.
(10b) Mary said "there are too many Honkies living around here."
(10c) Mary believes there are too many "Honkies" living around here.

In (10a) the expressive content of "Honkies" projects into wide scope as expected. In (10b) the quotation marks force the expressive content into narrow scope. In (10c) we have a mimicking case of quotation (this might be accompanied by explicit contextual cues such as mimicking Mary's voice when producing the word "Honkies" in an utterance of (10c)). Other contextual cues can make a reading like (10c) the only available interpretation of an utterance which superficially seems like (10a). Suppose that the speaker of (10a) is white, and that Mary is Black. Now it becomes clear that the intended interpretation of (10a) is (10c) and, similarly to (9), the availability of this interpretation requires knowledge of these facts on the part of the interpreter.[17]

Once we recognise these mimicking uses of quotation, we can make the further recognition that mimicry is not limited to reporting. We can also mimic the behaviour that we take ourselves to be liable to perform in hypothesised scenarios. This is what we propose is happening in cases of empathetic uses of like CE4 and CE5. Uses of empathetic expressives are also acts of mimicry but, rather than mimicking the speech of someone other than themselves, they are cases where speakers mimic the speech that they would utter if they were in the situation of their interlocutor (or whichever individual is made salient by the context).

Understood this way, we do not have a genuine departure from SD. The empathetic use of the expressive is understood as a form of open quotation but the quotation is not a report, it is simply a quote of what the speaker takes herself to appropriately utter in the counterfactual situation where she experiences what the person she empathizes with is actually experiencing. Effectively, this means that

empathetic uses are generated by a metalinguistic operation which shifts the context that the expressive must be interpreted with respect to away from the actual context to the counterfactual one. But no change is made to the speaker-dependent character of the expressive. The character of "ouch," for example, dictates that the expression is to be used in situations where the agent is experiencing pain or discomfort. In our scenario, B is not in any kind of pain or discomfort, yet apparently can felicitously use the expressive "ouch" in response to A's pain or discomfort. Rather than construing this as a case where B expresses A's attitude, our analysis takes the utterance to express A's attitude of empathy – A is mimicking exactly what she would say without pretense were she in the situation that B is in. Empathetic uses, in short, are context-shifting operators, where the speaker mimics the discomfort they would experience were they in a situation where they experience the misfortune in question. With such uses, speakers put themselves "in the shoes" of the targets of their empathy.

The analysis that we propose not only preserves SD, thereby simplifying the semantics of expressives by removing the need for a judge parameter within the context of utterance,[18] it also manages to do so in a way which gives a uniform analysis of the apparent counter-examples to SD which we have discussed in this paper. All of them, on our proposal, are heavily context-dependent and, hence, best explained as subject to a contextually cued quotational interpretation that shifts the relevant elements of the utterances.[19,20]

Author Contributions
All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

Conflict of Interest Statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

NOTES

1. See e.g. Bach (1999), Gutzmann (2015), Kaplan (1999, 2005), Kratzer (1999), Potts (2005, 2007), Simons et al. (2010).

2. Following Potts (2005) it is common to describe the two levels as the "at-issue" and "not-at-issue" content. The at-issue content is the truth-conditional content (*what is said*); the not-at-issue content may include presuppositional content, conventional implicatures, and so forth.

3. Potts (2005: 156) adopts a version of SD, citing with approval Cruse's (1986: 272) claim that a "characteristic distinguishing expressive meaning… is that it is valid only for the utterer, at the time and place of utterance. This limitation it shares with, for instance, a smile, a frown, a gesture of impatience…." Note, however, that Potts later goes on in his (2007) to reject SD, for reasons that we will discuss presently. Kaplan (2005: 6) also endorses a version of SD when he says: "the sentence *that damn Kaplan was promoted* is

going to be expressively correct just in case the speaker has a derogatory attitude toward Kaplan."

4. Harris and Potts (2009) present experimental data which they argue also supports the phenomenon of perspective-shifting to non-speaker-oriented readings for expressives. Interestingly, however, they take the heavy burden placed on contextual cues, and the apparent availability of such readings in non-attitude-ascribing contexts, to count against a semantic explanation and favour a pragmatic explanation of the phenomenon.

5. More formally, characters are functions from contexts to contents which, in the case of indexical expressions, will be non-constant functions (see Kaplan, 1977). Note that, as applied to expressives, this is a more specific use of the word "semantics" than is occasionally used in the philosophy of language, where "semantics" is thought to be (near-) equivalent to "truth-conditional content" (the latter, for instance, seems to be the sense of "semantics" as it is used in Predelli (2005), whereas his use of the term in his (2013) seems much closer to ours).

6. The claim that expressive content cannot be embedded in non-quotational environments has been widely held in the past: see e.g. Cruse (1986), Quang (1971), Soames (2002), Zimmerman (1991).

7. In what follows, all underlined content is our emphasis.

8. A possible response to CE5 might be to challenge the assumption that the correct semantics for "ouch" interprets it as a *subjective* expressive that expresses the speaker's distress, discomfort, etc. In this case the example would not be so much a counter-example to SD as it is to the proposed character of "ouch." Our own view, however, is that the subjective analysis for "ouch" is correct. The core uses of the term (e.g. speaker's immediate response to painful stimuli) seem clearly subjective in this sense. Accepting departures from this norm would therefore be, at best, an indication of an ambiguity in the term. Our proposal, below, accounts for the cases like CE5 without postulating such ambiguity hence we see no need to challenge the subjective analysis.

9. Thus see esp. Lasersohn (2005). John MacFarlane has also contributed extensively to this area: see esp. MacFarlane (2005a,b). Note that Lasersohn has developed his own approach to expressive content in his (2007), and has developed a far more comprehensive statement of his position in his (2017).

10. Other parameters for *demonstrata*, *addressees*, etc. may need to be added for some indexical utterances but we have kept things minimal for the sake of simplicity here. It seems uncontroversial to assume that the general semantic framework outlined here applies to expressives, and we will assume as much in what follows. However, as will become clear, we do not accept the controversial part of the Pottsian proposal, namely that a judge parameter *jc* is required in the model.

11. See Kölbel (2004) and Lasersohn (2005, 2017) for further elucidation of this intuition.

12. There are, of course, contexts where such an utterance may be pragmatically licensed, despite its semantic infelicity.

13. We are not alone in suspecting that something metalinguistic is at work here. See Predelli (2013: 106–107) and Anand (2007: 205) for similar responses to such cases.

14. For more discussion of these and related issues see Recanati (2009: 226–228).

15. Note that in this respect, we follow Grice (1989: 32) in thinking of irony and sarcasm as a case of conversational implicature, and hence as possessing a level of meaning distinct from the conventional meanings a sentence expresses (see also Bach, 1994: 140; Huang, 2007: 34). Potts (2005: 23) also seems to endorse this picture, whereby conversational implicatures (except, perhaps, for generalized conversational implicatures which in

any case are not of the same ilk as irony or sarcasm – see Levinson, 2000) are not encoded in the character of a locution. Hence we see no reason to think that a case of sarcasm requires us to modify our account of the semantics of expressive content.

16. Maier (2016) provides a compelling case against treatments of mixed quotation as semantic operations.

17. Thanks to Andreas de Jong for pointing out these kinds of cases.

18. Of course, there are independent reasons for thinking that judge parameters may be required in the circumstance of evaluation if one agrees with relativists like Lasersohn that there are genuinely relative truths. Our arguments here remain neutral on that point: our claim is simply that judges are redundant in the context of utterance as determinants of content. See Lasersohn (2017) for discussion of the difference between locating judges in contexts of utterance versus circumstances of evaluation.

19. A fundamental feature of apparently shifted expressives that has motivated our analysis is that they always rely heavily on contextual cues. This is widely recognized by theories which build shiftability into the semantics of expressives by the addition of a judge. For example, interesting data regarding so-called "modal particles" in German (which are often assimilated to expressives) appears to show that there are differences between them with regard to their shiftability, with some being apparently shiftable but only in response to explicit contextual cues, while others can never be shifted. Theorists like Gutzmann (2017) take this as evidence that some are judge-dependent, while some are speaker-dependent. Our alternative proposal is that such heavy context-sensitivity is evidence of a non-semantic influence of the sort we have outlined here.

20. We would like to thank audiences in both the Philosophy and Linguistics departments at The University of Manchester for helpful comments on presentations of this paper, and Martina Faller and Justina Berskyte for helpful discussions of these topics, as well as two anonymous referees for this journal.

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ORGANIZATIONAL RULES IN INTERPRETER-MEDIATED POLICE INTERVIEWS

FILIP BACALU
filip.bacalu@gmail.com
Hyperion University, Bucharest, Romania

ABSTRACT. This research synthesizes existing studies and investigates organizational rules in interpreter-mediated police interviews. Using data from Pew Research Center, I performed analyses and made estimates regarding percentage of officers saying it is very/somewhat/ not too/not at all important for officers to have detailed knowledge of the people, places and culture in the areas where they work, percentage of rank-and-file officers saying very few/ none/all or most/some of the people in the neighborhoods they routinely patrol share their values and beliefs, percentage of officers saying they would rate relations between the police in their department and particular groups (Whites/Blacks/Hispanics/Asians) in the community they serve as excellent/good/only fair/poor, percentage of officers saying they (strongly) agree that in certain areas of the city it is more useful for an officer to be aggressive than to be courteous/some people can only be brought to reason the hard and physical way, percentage of rank-and-file officers saying they have received four or more hours/less than four hours/none training in each of these areas in the past twelve months: firearms training involving shoot/don't shoot scenarios/nonlethal methods to control a combative or threatening individual/how to deal with individuals who are having a mental health crisis/how to de-escalate a situation so it is not necessary to use force/bias and fairness/how to deal with people so they feel they have been treated fairly and respectfully, and percentage of officers saying it is very/somewhat/not too/not at all important for law enforcement officers to have a good knowledge of what scientific research shows are effective policing strategies.

Keywords: organizational rule; interpreted-mediated police interview; defendant; testifier

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1. Introduction

Court interpreters have to translate for distinct listenership and accommodate various series of requirements of their performance and language utilization, while being legally constrained to adhere to the established standards of strict translation not-

withstanding its direction. Interpreters may play the part of a shock absorber between the divergent actors (Bacalu, 2018; Machan, 2017; Popescu Ljungholm, 2017a; Stewart and Mika, 2018), and thus between the areas of the disparate linguistic groups that interact in the courtroom, harmonizing their own conflicting commitments as bilinguals in a polyglot, culturally diverse community. (Angermeyer, 2009)

2. Literature Review

Interpreters are crucial in police interviewing testifiers from culturally and linguistically distinct settings. In the situations where interpreters are deficient in relevant professional features, in particular reproducing proficiency and nonpartisanship (Guilherme Nunes, Martins, and Mozzicafreddo, 2018; Meilă, 2018; Popescu Ljungholm, 2017b; Stoian and Drumea, 2017a), the elucidated evidence and declaration may not be an accurate reenactment of original statements. If concentration is missing on hypothetical amendments by interpreters to the original declarations of the testifier and duty of care is absent in the routine of collecting declaration from testifiers via such interpreters, the formal legal evidence might not be valid. Matters deriving from the deficiency in grasping the performance of interpreters might have repercussions for criminal proceedings. Besides interpreter guidance, more coherent police discipline in the embracing of exemplary practice regulations in interviewing via interpreters is necessitated. (Lee, 2017)

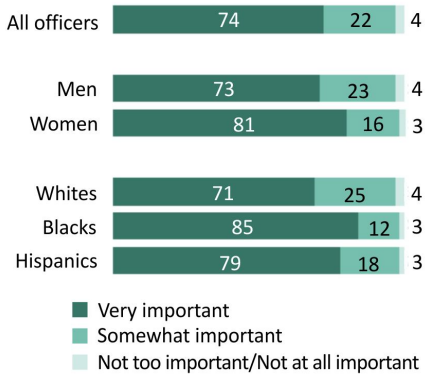
3. Methodology

Using data from Pew Research Center, I performed analyses and made estimates regarding percentage of officers saying it is very/somewhat/not too/not at all important for officers to have detailed knowledge of the people, places and culture in the areas where they work, percentage of rank-and-file officers saying very few/none/all or most/some of the people in the neighborhoods they routinely patrol share their values and beliefs, percentage of officers saying they would rate relations between the police in their department and particular groups (Whites/Blacks/Hispanics/Asians) in the community they serve as excellent/good/only fair/poor, percentage of officers saying they (strongly) agree that in certain areas of the city it is more useful for an officer to be aggressive than to be courteous/some people can only be brought to reason the hard and physical way, percentage of rank-and-file officers saying they have received four or more hours/less than four hours/none training in each of these areas in the past twelve months: firearms training involving shoot/don't shoot scenarios/nonlethal methods to control a combative or threatening individual/how to deal with individuals who are having a mental health crisis/how to de-escalate a situation so it is not necessary to use force/bias and fairness/how to deal with people so they feel they have been treated fairly and respectfully, and percentage of officers saying it is very/somewhat/not too/not at all important for law enforcement officers today to have a good knowledge of what scientific research shows are effective policing strategies.

4. Results and Discussion

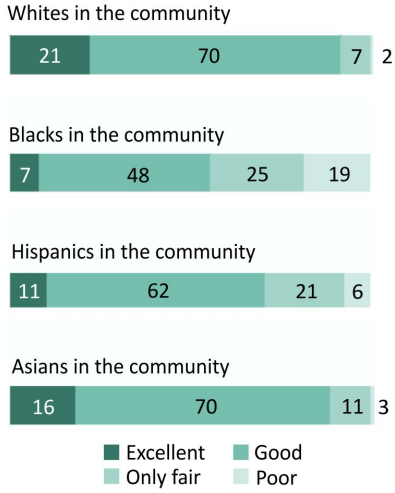
Conveying a defendant's rights in police interviews constitutes an intricate task for individuals having roots in various cultural settings or legal systems and depending on interpreters in such cases. Thus, guaranteeing an all-encompassing comprehension of their rights (King, 2017; Mihăilă et al., 2018; Rădulescu, 2017a; Stoian and Drumea, 2017b) and suitably appealing to them can be demanding. (Nakane, 2007) (Figures 1–6)

Figure 1 Percentage of officers saying it is … for officers to have detailed knowledge of the people, places and culture in the areas where they work



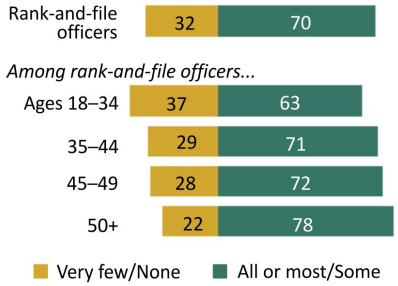
Sources: Pew Research Center; my survey among 1,200 individuals conducted June 2018.

Figure 2 Percentage of officers saying they would rate relations between the police in their department and the following groups in the community they serve as …



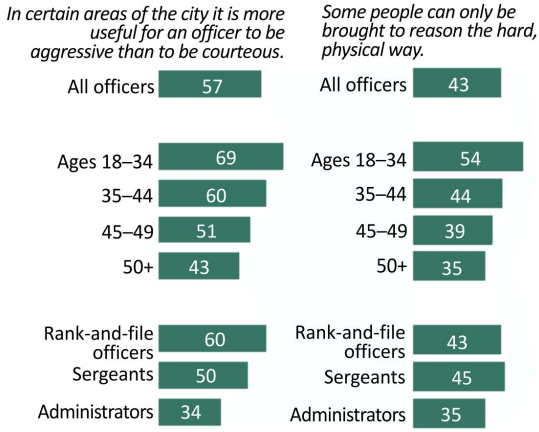
Sources: Pew Research Center; my survey among 1,200 individuals conducted June 2018.

Figure 3 Percentage of rank-and-file officers saying … of the people in the neighborhoods they routinely patrol share their values and beliefs



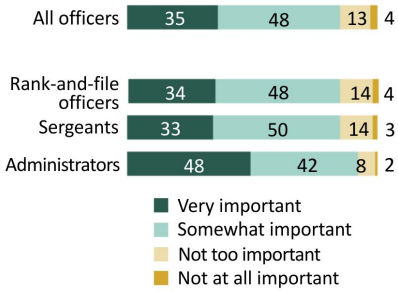
Sources: Pew Research Center; my survey among 1,200 individuals conducted June 2018.

Figure 4 Percentage of officers saying they (strongly) agree that …



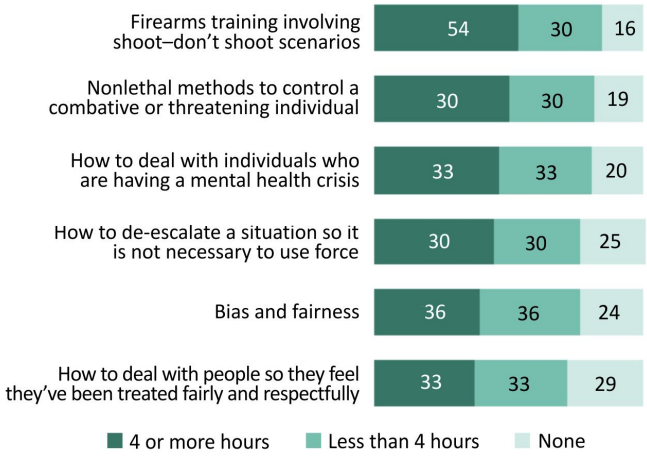
Sources: Pew Research Center; my survey among 1,200 individuals conducted June 2018.

Figure 5 Percentage of officers saying it is … for law enforcement officers to have a good knowledge of what scientific research shows are effective policing strategies



Sources: Pew Research Center; my survey among 1,200 individuals conducted June 2018.

Figure 6 Percentage of rank-and-file officers saying they have received … training in each of the following areas in the past 12 months



Sources: Pew Research Center; my survey among 1,200 individuals conducted June 2018.

5. Conclusions

Interview evidence is instrumental when a person necessitates interpreting assistance. The attendance of an interpreter has relevance for the underlying forces of the interplay. As regards training, the multilingual character of nearly all urban policing environments in many instances goes undervalued. In courtroom proceedings, an interpreter has to intervene between people of various language communities for the purpose of furthering unreserved synergy by supplying linguistic and cultural counterparts (Kmecova, 2018; Peters, 2018; Rădulescu, 2017b) so that the original idea is communicated in the interpreted discourse. Throughout numerous jurisdictions, police officers are cognizant that professional and qualified interpreting services may be decisive in hindering possible errors of justice, and that the standard of interpreting services is relevant to the after-effect degree of justice. Concerning the interrogation and interviewing of defendants, police officers might be to a greater degree used to employing questioning management techniques to bring to light evidence from defendants or testifiers when resorting to interpreters. (Fowler, Vaughan, and Wheatcroft, 2016)

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The author confirms being the sole contributor of this work and approved it for publication.

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ARE THE WORKERS IN THE ON-DEMAND ECONOMY EMPLOYEES, INDEPENDENT CONTRACTORS, OR A HYBRID CATEGORY?

DOINA POPESCU LJUNGHOLM
dopopescu@yahoo.com
University of Pitești, Romania

ABSTRACT. This article reviews and advances existing literature concerning whether the workers in the on-demand economy are employees, independent contractors, or a hybrid category. Building my argument by drawing on data collected from Bureau of Labor Statistics, Edelman Intelligence, Elance-oDesk, Ernst & Young, Freelancers Union, Human-Resources, NPR/Marist, PersolKelly, Pew Research Center, and Upwork, I performed analyses and made estimates regarding the likely impact of some workers preferring flexible contract-based roles over traditional permanent full-time roles (%), issues free-lancers are concerned about (%), how benefits differ for part-time, full-time, and contract workers (%), and reasons for using contingent workers (%).

Keywords: on-demand economy; employee; independent contractor; hybrid category

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1. Introduction

Pivotal economic and labor tensions characterize the gig-economy as the casual, insecure, and growingly fragmented workplace. The platform economy is predominantly lucrative and encompasses individuals who are engaged in a transaction that resembles work performed as a permanent occupation for pay. The apprehensions that rigorous guidelines will force platforms out of business are exaggerated. Insofar as the sharing economy concerns environmental decisions and entails collective ownership and resources (Brennan, 2018; Melián González, 2018; Nica, 2017; Petcu, 2018; Popescu Ljungholm, 2018a, b, c, d), if the work resembles volunteerism pushed forward for benevolent grounds or humanitarian incentives, there should be a protection set up. (Cherry and Aloisi, 2017)

2. Conceptual Framework and Literature Review

Current gig economy workers are not as self-determining as the freelancers that judges meant when they differentiated between employees and independent contractors, and are not indeed rivals such that allowing them to participate in joint bargaining would be to some extent alike to agreeing to an alliance of competing providers. The online platform pattern depends considerably on unstable (Drugău-Constantin, 2018; Mihăilă et al., 2018; Nica, 2018; Peters, 2016; Shang et al., 2018), unconventional work relationships. Conformity to particular mandates for employees may make unrealizable the adjustable pattern that characterizes gig economy ventures. The weaknesses in the gig economy workers' cooperation with the platform/go-between (Hoffman and Friedman, 2018; Mirică (Dumitrescu), 2018; Nordberg, 2017; Popescu et al., 2018a; Sponte (Piştalu), 2018) are somewhat comparable to those of personnel in an employment relationship. Protecting their joint negotiation with the platform/go-between from the antitrust law would allow workers to assemble their bargaining capacity to discuss a settlement for possibly a more significant revenue split that would in actual fact restore the upsides that they, being non-employees, are not provided with. (Lao, 2018)

3. Methodology and Empirical Analysis

Building my argument by drawing on data collected from Bureau of Labor Statistics, Edelman Intelligence, Elance-oDesk, Ernst & Young, Freelancers Union, HumanResources, NPR/Marist, PersolKelly, Pew Research Center, and Upwork, I performed analyses and made estimates regarding the likely impact of some workers preferring flexible contract-based roles over traditional permanent full-time roles (%), issues freelancers are concerned about (%), how benefits differ for part-time, full-time, and contract workers (%), and reasons for using contingent workers (%).

4. Results and Discussion

Notions, awareness, labor and use rights for inactive items in circulation relocate between geographically dispersed but networked and collaborative online groups (Hyers and Kovacova, 2018; Mitea, 2018; Nugent, 2018; Popescu et al., 2018b; St Clare, 2018), being qualified in a way that is rigorously in accordance with the representative setting of the platform as a catalyst of shared economic culture. Such digital economic distribution is noticeable throughout various digital economic ecologies, being articulated as interconnected exchange relations typified by their disintermediated, synergetic and regularizing features. (Langley and Leyshon, 2017) Community-based platforms capitalize on the scaling capacity of platforms for the benefit of the group, either by employing a governance procedure that ensures reallocation to offset stakeholder concerns or by harmonizing the objective of the platform in the direction of the community interest. Platform cooperatives manage

the trade-off between bringing together standard impact investors and embracing surrogate reallocation strategies that may discourage such stakeholders. (Acquier, Daudigeos, and Pinkse, 2017) (Tables 1–10)

Table 1 The likely impact of some workers preferring flexible contract-based roles over traditional permanent full-time roles (%)

Organizations face challenges regarding the integration of freelancers and permanent staff	18
Increased employee satisfaction and productivity as individuals choose what work they do	17
Companies can access a fluid workforce that is adaptive to change	16
Workers may lose their protections and access to health and safety provisions etc.	14
It saves organizations money as they may not have to pay recruitment costs and traditional entitlements (leave, sick leave, super, workers comp etc.)	14
Increased labor force participation as people can work where, when and how they want/need to	14
Organizations are at risk as new business models may not comply with workplace legislation	7

Sources: PersolKelly; HumanResources; my survey among 5,200 individuals conducted November 2018.

Table 2 Issues freelancers are concerned about (%)

Access to affordable healthcare	19
Unpredictable income	22
Saving for retirement	21
Being paid a fair rate	18
Debt	17
High taxation rates	12
Difficulty finding work	14
Being able to put enough money into savings	16
Non-payment or late payment for work	12
Having opportunities for career growth	11

Sources: Edelman Intelligence; Upwork; my survey among 4,700 individuals conducted November 2018.

Table 3 What is holding you back from quitting your primary job to work independently? (%)

Worries about income predictability	62
Uncertainty that you could “make it” on your own	47
Desire to keep company sponsored benefits such as health insurance, paid vacation, and life insurance	36
Concern that you would be able to find enough work to support yourself	51
Difficulty finding freelance work	27

Sources: Edelman Intelligence; Upwork; my survey among 5,400 individuals conducted November 2018.

Table 4 How has the percentage of your freelancing work obtained online, as compared to offline, changed in the past year?

Increased a lot	29
Increased somewhat	37
Stayed about the same	20
Decreased somewhat/a lot	4

Sources: Edelman Intelligence; Upwork; my survey among 6,100 individuals conducted November 2018.

Table 5 The freelance workforce (%)

Independent contractors	33
Diversified workers	32
Moonlighters	28
Temporary workers	4
Freelance business owners	3

Sources: Edelman Intelligence; Upwork; my 2019 estimates.

Table 6 The gig jobs picture: Percentage of total U.S. employment

	1995	2005	2017	2018
Independent contractors	6.7	7.4	6.9	7.1
On-call workers	1.7	1.8	1.7	1.9
Temporary help agency	1.0	0.9	0.9	1.1
Contract workers	0.5	0.6	0.6	0.7
Total	9.9	10.7	10.1	10.8

Sources: Bureau of Labor Statistics; my 2018 data.

Table 7 Percentage of U.S. adults who say that Internet-enabled gig work

	No	Yes	Not sure
Is great for people who want flexible work schedules	5	71	24
Is good for older people who do not work full time	12	52	36
Is a good entry-level job for those entering workforce	23	32	45
Lets companies take advantage of workers	37	29	34
Places too much financial burden on workers	31	24	45
Is the kind of job people can build careers out of	38	18	44

Sources: Pew Research Center; my survey among 5,400 individuals conducted November 2018.

Table 8 The 5 types of freelancers: Percentage of the independent contractors/professionals

Independent contractors	43
Moonlighters	24
Diversified workers	19
Temporary workers	12
Freelance business owners	4

Sources: Freelancers Union; Elance-oDesk; my survey among 4,800 individuals conducted November 2018.

Table 9 How benefits differ for part-time, full-time, and contract workers (%)

	Any benefits	Health insurance	Retirement plan	Pension
All workers	62	57	55	26
Full-time	78	74	66	34
Part-time	37	19	22	12
Contract	51	39	29	21

Sources: NPR/Marist; my survey among 4,400 individuals conducted November 2018.

Table 10 Reasons for using contingent workers (%)

To complete projects requiring specific expertise/capability beyond existing workforce	61
Controlling total labor costs	54
Respond to seasonal workforce requirements	47
Improve existing workforce culture and productivity	42
Develop skills of existing workforce	35
Our organization has always done it this way	27
Other	14
Don't know	3

Sources: Ernst & Young; my survey among 4,900 individuals conducted November 2018.

5. Conclusions and Implications

Present labor and employment laws do not satisfactorily explain away the new kinds of hiring relationships established within the fast-increasing sharing economy. A great deal of legal confusion in the employment law framework has been brought about by online marketplaces (Meilă, 2018a, b; Neary et al., 2018; Petcu, 2017; Popescu Ljungholm, 2017; Vochozka et al., 2018) where high-tech platforms enable peer-to-peer dealings. Workers who participate in such markets constitute employment relationships that adopt features of both business acumen and the employer–employee link. Sharing economy workers operate in the boundary between employees and independent contractors. Superannuated employment categorizations have to be updated and the conventional concepts of employment relationships should be reconsidered to include the new, swiftly increasing human resources within the sharing economy. (McCabe, 2016)

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ALGORITHMIC TEXTUAL PRACTICES: IMPROVING FLUENCY AND WORD ORDER IN NEURAL MACHINE TRANSLATION OUTPUT

ADINA RĂDULESCU
adina.radulescu@spiruharet.ro
Spiru Haret University, Bucharest, Romania

ABSTRACT. This research investigates how to improve fluency and word order in neural machine translation output. Building my argument by drawing on data collected from the Boston Consulting Group, Deloitte, eMarketer, Locaria, *MIT Sloan Management Review*, NCSC, and Statista, I performed analyses and made estimates regarding awareness and usage of translation applications featuring machine learning (%), how professional translators worldwide see artificial intelligence affecting their work in the future (%), and market size of the global language services industry (billion U.S. dollars). The results of a study based on data gathered from 4,200 respondents provide support for my research model. Employing the structural equation modeling and using the probability sampling technique, I collected and inspected data via a self-administrated questionnaire.

Keywords: fluency; word order; neural machine translation; algorithm; textual practice

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1. Introduction

Neural machine translation constitutes a substitute to the statistical machine translation pattern in diverse languages. (Eriguchi et al., 2019) The prevailing neural machine translation patterns commonly employ word-level modeling to insert input sentences into semantic space (Balica, 2018; Cruciani, 2018; Fabrício, 2016; Lăzăroiu, 2018; Mihăilă and Mateescu, 2017; Nica, 2018; Popescu, 2017a, b; Rădulescu, 2017), but that may not be adequate for the encoder modeling of neural machine translation, particularly for languages where tokenizations are typically confusing, as there may be tokenization inaccuracies which may adversely shape the encoder modeling of neural machine translation, while the adequate tokenization granularity is ambiguous. (Tan et al., 2018)

2. Conceptual Framework and Literature Review

Neural machine translation represents a groundbreaking model, and the attention mechanism (Bolton et al., 2018; Dicu, 2018; Farber, 2017; Machan, 2017; Mihăilă, 2018; Nica et al., 2018; Popescu et al., 2017; Sion, 2018a, b) is the prominent method with the cutting-edge records in numerous language pairs. All options of the attention mechanism employ only temporal awareness where one scalar value is allocated to one context vector matching a source word. (Choi et al., 2018) Undeveloped neural machine translation patterns are contingent on sequence-to-sequence learning that expresses in code a sequence of source words into a vector space and produces an additional sequence of target words from the vector: sentences are interpreted just as sequences of words with no internal structure. (Eriguchi et al., 2019) The naive back-translation method enhances the translation performance considerably, but its application for monolingual input is not relevantly valid as established neural machine translation patterns do not differentiate between the genuine parallel corpus and the back translated synthetic parallel one. (Yang et al., 2019)

3. Methodology and Empirical Analysis

Building my argument by drawing on data collected from the Boston Consulting Group, Deloitte, eMarketer, Locaria, *MIT Sloan Management Review*, NCSC, and Statista, I performed analyses and made estimates regarding awareness and usage of translation applications featuring machine learning (%), how professional translators worldwide see artificial intelligence affecting their work in the future (%), and market size of the global language services industry (billion U.S. dollars). The results of a study based on data gathered from 4,200 respondents provide support for my research model. Employing the structural equation modeling and using the probability sampling technique, I collected and inspected data via a self-administrated questionnaire.

4. Results and Discussion

Current developments of neural machine translation are instrumental in performing translation by employing an uncomplicated end-to-end architecture. (Eriguchi et al., 2019) Similarly as any machine learning algorithms, neural networks represent a definite class of statistical learning patterns. (Petrucci et al., 2018) Machine translation is presently going through a paradigm repositioning from statistical to neural network patterns. (Moorkens, 2018) Neural machine translation generates significantly fewer lexical, morphology, and word order errors, better configurations in the rearrangement of verbs and nouns, but produces more inaccuracies in the translation of proper nouns than phrase-based approaches. (Bentivogli et al., 2018) Nearly all applications of neural machine translation patterns use a padding approach

when processing a mini-batch to alter to the same length all sentences in it. (Qiao et al., 2018) Statistical machine translation systems are disadvantaged by fluency errors, notably as grammatical inaccuracies and ones concerning idiomatic word choices. (Tezcan et al., 2019) (Tables 1–6)

Table 1 Awareness and usage of smartphone applications featuring machine learning (%)

	Awareness	Usage
Predictive text	54	38
Route suggestions	40	26
Voice assistants	39	15
Voice search	35	14
Translation apps	31	16
Voice-to-text	27	12
Email classification	26	11
Automated calendar entries	22	9
Location-based app suggestions	21	11
Automated photo classification	21	8

Sources: Deloitte; Statista; my survey among 4,200 individuals conducted November 2018.

Table 2 Market size of the global language services industry (billion U.S. dollars)

2009	23.5
2010	26.3
2011	28.34
2012	33.05
2013	34.78
2014	37.19
2015	38.16
2016	40.27
2017	43.08
2018	46.52
2019	49.14

Sources: Statista; my estimates.

Table 3 Do you utilize remote interpreting technology? (Check all that apply, %)

Audio or telephonic interpretation (standard telephone)	88
Video conferencing	61
Video remote interpreting	52
Web-based applications (e.g. Skype)	48
Specialized telephone equipment	34
Other technological solutions (please provide details)	23
Voice over internet protocol	21
Translation software and automated interpreter software	18
N/A	7

Sources: NCSC; my survey among 4,200 individuals conducted November 2018.

Table 4 Levels of understanding for artificial intelligence-related technology and business context: To what extent do you agree with the following statements about your organization? (%)

	We understand…	Pioneers	Investigators	Experimenters	Passives
Technology implications	Required technological breakthroughs to succeed with artificial intelligence	92	78	27	15
Technology implications	Data required for artificial intelligence algorithm training	87	76	24	11
Technology implications	Processes for artificial intelligence algorithm training	86	70	20	7
Business implications	Artificial intelligence-related changed ways of business value generation	92	84	33	22
Business implications	Development time of artificial intelligence-based products and services	85	74	21	18
Business implications	Development costs of artificial intelligence-based products and services	83	75	16	10
Workplace implications	Required changes of knowledge and skills for future artificial intelligence needs	84	84	22	19
Workplace implications	Effect of artificial intelligence in the workplace on organization's behavior	87	78	18	18
Industry implications	Artificial intelligence-related shift of industry power dynamics	83	83	22	18

Sources: *MIT Sloan Management Review*; The Boston Consulting Group; my survey among 4,200 individuals conducted November 2018.

Table 5 How professional translators worldwide see artificial intelligence affecting their work in the future (%)

No impact whatsoever	4
Less work for professional translators	46
Same volume but higher standards expected	37
Overall volume of work will grow	13

Sources: Locaria; eMarketer; my survey among 4,200 individuals conducted November 2018.

Table 6 The effect of artificial intelligence on the workforce (%)

Organizational level	Existing workers will need to change their skill sets	84
Organizational level	Our organization's productivity will improve	79
Organizational level	Workers' current skill sets will be augmented	74
Organizational level	Our organization's workforce will be reduced	50
Personal level	I hope that artificial intelligence will do some of the current tasks in my job	72
Personal level	I fear that artificial intelligence will do some of the current tasks in my job	40

Sources: *MIT Sloan Management Review*; The Boston Consulting Group; my survey among 4,200 individuals conducted November 2018.

5. Conclusions and Implications

Neural machine translation is ordinarily enhanced to produce sentences which comprise n-grams with ground target to the fullest extent, but n-gram precisions, the physically fashioned approximate loss function, can misdirect the pattern to create suboptimal translations. (Yang et al., 2018) Handling the ontology learning problem as a neural machine translation assignment may be a sound manner to approach perpetual expressive ontology learning tasks (Bratu, 2018; Donnelly, 2017; King, 2017; Michailidou, 2018; Nica, 2017; Peters, 2017; Popescu, 2018; Skordoulis, 2016; Smith and Stirling, 2018), such as language inconsistency, domain self-determination, and significant engineering expenses. (Petrucci et al., 2018) Neural networks integrate frame of reference from the training input, source text, and elaborating target text and mostly generate words in the adequate context, although systems are nevertheless inconstant and necessitate human review. (Taivalkoski-Shilov, 2018)

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The author confirms being the sole contributor of this work and approved it for publication.

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SELF-PORTRAITS IN SOCIAL MEDIA: MEANS OF COMMUNICATING EMOTION THROUGH VISUAL CONTENT-SHARING APPLICATIONS

GRAȚIELA SION
gratielasion@gmail.com
Spiru Haret University, Bucharest, Romania

ABSTRACT. The purpose of this study was to empirically examine means of communicating emotion through visual content-sharing applications. Building my argument by drawing on data collected from Georgia Institute of Technology, Mashable, Pew Research Center, Suggestme, Statista, and TechInfographics, I performed analyses and made estimates regarding U.S. adults who have ever taken a selfie and uploaded it to a social media website (%, by age group), selfies taken by category of the photographer (%), most popular cities to take a selfie in (% of all analyzed selfies), % saying they have shared a selfie (Millennial, Gen X, Boomer, and Silent), where selfies are being shared the most (%, Facebook, WhatsApp, Twitter, Instagram, Snapchat, and Pinterest), number of selfies posted weekly (%, by gender), and ways of sharing selfies (%, by demographic profile). Empirical data for this research were collected through an online survey conducted in the United States. The structural equation modeling technique was employed to test the research model.

Keywords: selfie; communication; emotion; visual content-sharing application

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1. Introduction

Taking selfies and distributing them to social media is a prominent online activity. (Wang et al., 2017) The selfie is an apparent materialization of the mediated presentation of ways of living in a visually-led and entertainment-oriented economy. (Hackley et al., 2018) Selfies entail an ostentatious urgency for approving feedback from peers. The links of grandiose and nonpathological narcissism with digital self-portraits may be more noticeable among users having a large amount of followers. (Barry et al., 2019)

2. Conceptual Framework and Literature Review

The digital self-portrait is a pattern of the epoch of media convergence, and the selfie phenomenon is not pure and simple narcissism or unfitness, but is a component of a more extensive representational and performative repositioning furthered by social media networks and mobile interaction technology (Fabrício, 2016; Havu, 2017; Kirby et al., 2018; Machan, 2016; Mihăilă, 2017; Mirică (Dumitrescu), 2018; Pilkington, 2018; Roberts and Marchais, 2018; Teubner et al., 2017), and reinforced by celebrity culture. (Hackley et al., 2018) Users' perceptions of visual content-sharing applications as determinants of brand/product data are decidedly anticipated by their brand-selfie posting behaviors. (Sung et al., 2018) A type of self-portraiture routinely produced employing smartphones or webcams and distributed on social media, the selfie has swiftly emerged into the joint graphic vernacular, underscoring a culture preoccupied with itself and indicating the intrinsic frictions between factuality, digitality, and selfhood. (Hess, 2015)

3. Methodology and Empirical Analysis

Building my argument by drawing on data collected from Georgia Institute of Technology, Mashable, Pew Research Center, Suggestme, Statista, and TechInfographics, I performed analyses and made estimates regarding U.S. adults who have ever taken a selfie and uploaded it to a social media website (%, by age group), selfies taken by category of the photographer (%), most popular cities to take a selfie in (% of all analyzed selfies), % saying they have shared a selfie (Millennial, Gen X, Boomer, and Silent), where selfies are being shared the most (%, Facebook, WhatsApp, Twitter, Instagram, Snapchat, and Pinterest), number of selfies posted weekly (%, by gender), and ways of sharing selfies (%, by demographic profile). Empirical data for this research were collected through an online survey conducted in the United States. The structural equation modeling technique was employed to test the research model.

4. Results and Discussion

By capturing a glimpse of reality, a selfie links dissimilar modes of performance into a single act, giving prominence to the bodily self, grasped in connection with the proximate physical realm, reached gradually via the digital gadget, and intended for social networks. These components are interconnected, generating opposing inferences and discourses of integration and representation (Carter and Yeo, 2018; Gray-Hawkins, 2018; Katz, 2018; Lăzăroiu, 2018; Meilă, 2018; Mircică, 2018; Peters, 2018; Rădulescu, 2018; Savin-Baden et al., 2017) into an expeditious picture. (Hess, 2015) Numerous users, without taking into account their level of narcissism may merely post selfies as a manner of acting in accordance with a prevalent cultural norm. (Barry et al., 2019) Recurrent selfie viewing behavior may

result in diminished life contentment while persistent groupie viewing behavior may lead to amplified life contentment. (Wang et al., 2017) (Tables 1–10)

Table 1 Selfies taken by category of the photographer (%)

Appearance	49
Family, friends, and pets	19
Ethnicity	10
Travel	9
Health and fitness	8
Others	7

Sources: Georgia Institute of Technology; Statista.
Note: Based on my analysis of 2.3 million selfie posts on Instagram.

Table 2 Most popular cities to take a selfie in (% of all analyzed selfies)

London	13.85
New York	13.14
Amsterdam	9.26
Paris	9.39
Barcelona	9.34
Berlin	7.64
Rome	8.12
Istanbul	4.43
Sydney	3.81
Athens	2.75

Sources: Suggestme; Mashable; Statista.
Note: Based on my analysis of 5.8 million social media posts.

Table 3 % saying they have shared a selfie

Millennial	57
Gen X	34
Boomer	9
Silent	2

Sources: Pew Research Center; my survey among 6,800 individuals conducted October 2018.

Table 4 Users who say each is a major reason they use Facebook (%)

See what friends and family are up to	74
See photos and videos from family and friends	59
Chat or message with friends and family	44
Share my photos or videos	38
Post personal updates	21
Get news	14
Play games	11

Sources: Pew Research Center; my survey among 6,800 individuals conducted October 2018.

Table 5 U.S. adults who have ever taken a selfie and uploaded it to a social media website (%, by age group)

18–24	97
25–34	84
35–44	72
45–54	54
55+	22

Sources: Statista; my survey among 6,800 individuals conducted October 2018.

Table 6 Where selfies are being shared the most (%)

Facebook	46
WhatsApp	29
Twitter	14
Instagram	14
Snapchat	6
Pinterest	1

Sources: TechInfographics; my survey among 6,800 individuals conducted October 2018.

Table 7 Number of selfies posted weekly (%, by gender)

	Female	Male
None	57	56
1–2	31	30
3–4	6	7
5–6	3	3
7–8	2	2
More than 8	1	2

Sources: Statista; my survey among 6,800 individuals conducted October 2018.

Table 8 Ways of sharing selfies (%, by demographic profile)

	Female	Male	18–24	25–34	35–44	45–54	55+
Publish it on social media	23	21					
Send it in private to your close friends	20	11	16	19	21	24	26
Send it in private to your partner	17	16	14	16	17	20	19
Keep it for yourself	4	6	2	3	3	3	6
I don’t take selfies			1	3	5	8	11

Sources: Statista; my survey among 6,800 individuals conducted October 2018.

Table 9 U.S. adults who have ever taken a selfie and uploaded it to a social media website (%, by gender)

	Have taken selfie	Have never taken selfie/Not sure
Male	64	36
Female	68	32

Sources: Statista; my survey among 6,800 individuals conducted October 2018.

Table 10 Among U.S. adults who say they use …, % who use each site …

	Several times a day	About once a day	Less often
Facebook	54	29	17
Instagram	44	27	29
Snapchat	49	24	27
Youtube	37	23	40
Twitter	28	20	52

Sources: Pew Research Center; my survey among 6,800 individuals conducted October 2018.

5. Conclusions and Implications

Narcissism, pragmatism, and the conviction that visual content-sharing applications constitute brand/product data sources are importantly associated with social media users' brand-selfie posting behavior. (Sung et al., 2018) Recurrent selfie viewing behavior may generate lower self-confidence whereas persistent groupie viewing behavior may bring about amplified self-confidence. (Wang et al., 2017) Self-reported narcissism and detected posts of digital self-portraits on social media networks are not jointly linked. (Barry et al., 2019) The likelihood for confidence-building is intrinsic in the graphic arrangement of the selfie that, as a genre, it is appropriate for putting information into context (Bratu, 2018; Fielden et al., 2018; Jouët, 2018; Lăzăroiu, 2017; Machan, 2017a, b; Mircică, 2017; Mitea, 2018; Nica et al., 2017a, b; Popescu, 2018; Roca-Sales and Lopez-Garcia, 2017; Walker and Lovat, 2018) throughout settings and social media platforms. (Zhao and Zappavigna, 2018) While characterizations of narcissism proliferate, the selfie leads to a distinct analysis of the intricate character of networked social order. (Hess, 2015)

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NUTRITIONAL GENOMICS IN PERSONALIZED MEDICINE: DATA-DRIVEN CUSTOMIZED TREATMENTS AND LIFESTYLE-BASED DISEASE MANAGEMENT AND PREVENTION

SOFIA BRATU
sofiabratu@yahoo.com
Spiru Haret University, Bucharest, Romania

ABSTRACT. Despite the relevance of nutritional genomics in personalized medicine, only limited research has been conducted on this topic. Using and replicating data from ABS, CCHS, CRN, Euromonitor International, Ipsos Public Affairs, Mintel, and Statista, I performed analyses and made estimates regarding U.S. people who take nutritional supplements and top reasons for taking them (%, by age group and sex), healthy habits of U.S. adult supplement users vs. non-users (%), U.S. adults who use an app to track their diet and nutrition (%), proportion of calories from fresh food, packaged food, soft drinks, and alcoholic drinks (% of total calories purchased), prevalence of inadequate fruit and vegetable intake (%, age groups), and prevalence of usual intakes of sodium exceeding the tolerable upper intake level (%, by sex and age groups). The data for this article were collected through an online survey questionnaire and were analyzed via structural equation modeling on a sample of 4,800 respondents.

Keywords: nutritional genomics; personalized medicine; customized treatment; disease

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1. Introduction

Individuals feature unique glycemic reactions to exactly the same foods. (Bashiardes et al., 2018) Unsatisfactory adjustment to public dietary guidance and separate health feedback are not adequately displayed by population averages, because nonspecific public health recommendations are low on importance for people, personally and medically. (Michel and Burbidge, 2019) The main target of public health advice associated with the hindrance of food-related chronic disease is the choosing of nutritious dietary models. (Laddu and Hauser, 2019)

2. Conceptual Framework and Literature Review

Genome and microbiome information may elucidate particular clinical characteristics. (Bashiardes et al., 2018) A person's regime and environment may shape disease predisposition by influencing the expression of genes related to critical metabolic routes. (Laddu and Hauser, 2019) The developments in the knowledge base of the intricate synergies among genotype, nutritional therapy, style of living, and environment bring about modifications (Andronicean u, 2017; Bratu, 2017; Caruso et al., 2017; Faggianelli et al., 2018; Ionescu, 2018; Massey et al., 2018; Nica, 2017; Ralston et al., 2018; Smith and Stirling, 2018) in present medical routine to eventually generate personalized nutrition advice for health and risk evaluation, as intakes and dietary supplements distinctively impact the good physical condition of persons. An individual's gut microbiota is decisive in encompassing the multiple-functional links with elaborate metabolic processes entailed in preserving cellular homeostasis. (Aruoma et al., 2019) The big data tools of personalized nutrition are facilitating the advancement of more customized and predictive dietary advice and interventions against energy imbalance and metabolic disease that may alter how individuals make food choices and significantly enhance population health. (O'Sullivan et al., 2018)

3. Methodology and Empirical Analysis

Using and replicating data from ABS, CCHS, CRN, Euromonitor International, Ipsos Public Affairs, Mintel, and Statista, I performed analyses and made estimates regarding U.S. people who take nutritional supplements and top reasons for taking them (%, by age group and sex), healthy habits of U.S. adult supplement users vs. non-users (%), U.S. adults who use an app to track their diet and nutrition (%), proportion of calories from fresh food, packaged food, soft drinks, and alcoholic drinks (% of total calories purchased), prevalence of inadequate fruit and vegetable intake (%, age groups), and prevalence of usual intakes of sodium exceeding the tolerable upper intake level (%, by sex and age groups). The data for this article were collected through an online survey questionnaire and were analyzed via structural equation modeling on a sample of 4,800 respondents.

4. Results and Discussion

Personalized algorithms facilitate the precise prediction of glycemic reactions to foods. (Bashiardes et al., 2018) Personalized nutrition can explain findings concerning heterogeneity in nutrient metabolism between subcategories and the inter-individual inconsistency in the feedback to dietary interventions, providing particular, applicable dietary treatment contingent on distinct nutritional phenotype, generated from the synthesis of genetics, metabolic profile, and environmental components (Benedikter et al., 2017; Bratu, 2018; Douglas, 2018; Freeman-Moir, 2017;

Lupu-Stănescu, 2018; Mihăilă, 2017; Popescu Ljungholm, 2017; Schinckus, 2018; Tanankem Voufo et al., 2017) for the purpose of preventing and treating chronic disease. (Laddu and Hauser, 2019) User's genetic composition is employed in the manufacturing operation of hyper-personalized consumer products (Banerjee et al., 2016; Carter and Yeo, 2018; Drugău-Constantin, 2018; Hurd, 2016; Machan, 2016a, b; Mirică (Dumitrescu), 2018; Popescu Ljungholm, 2018; Sharp, 2016) that prioritize refinement and exceptionality, and reap high prices. (Rosenbaum et al., 2019) (Tables 1–9)

Table 1 Proportion of launches carrying an organic claim (top 10 countries)

Germany	23
Sweden	21
Netherlands	19
Czech Republic	18
Denmark	17
Austria	17
France	16
USA	14
Norway	12
Switzerland	11

Sources: Mintel; my survey among 4,800 individuals conducted October 2018.

Table 2 Prevalence of inadequate fruit and vegetable intake (%, age groups)

Age group	Inadequate fruit	Inadequate vegetables
18–24	54	91
25–34	52	88
35–44	49	87
45–54	47	86
55–64	45	86
65–74	44	85
75+	42	84

Sources: ABS; my survey among 4,800 individuals conducted October 2018.

Table 3 Most popular supplements among U.S. adults (%)

Multivitamin	58
Vitamin D	31
Vitamin C	26
Calcium	24
Vitamin B/B Complex	24
Protein	23
Omega 3/Fatty Acids	21
Probiotics	18
Magnesium	17
Vitamin E	16
Fiber	14
Green Tea	13

Sources: CRN; Ipsos Public Affairs; my survey among 4,800 individuals conducted October 2018.

Table 4 U.S. people who take nutritional supplements (%, by age group and sex)

Age group	Male	Female
1–3	43	
4–8	48	
9–13	37	
14–18	35	
19–30	32	
31–50	38	
51–70	44	
71+	52	

Sources: CCHS; my survey among 4,800 individuals conducted October 2018.

Table 5 Top reasons for taking supplements (%)

Overall health/wellness	52
Fill nutrient gaps in diet	36
Energy	29
Immune health	27
Bone health	25
Heart health	25
Healthy aging	24

Sources: CRN; Ipsos Public Affairs; my survey among 4,800 individuals conducted October 2018.

Table 6 Healthy habits of U.S. adult supplement users vs. non-users (%)

	Users	Non-users
Exercise regularly	72	60
Visit doctor regularly	78	64
Try to eat a balanced diet	89	72
Get a good night's sleep	77	63
Maintain a healthy weight	67	61
Do not smoke/use tobacco	79	64

Sources: CRN; Ipsos Public Affairs; my survey among 4,800 individuals conducted October 2018.

Table 7 Proportion of calories from Fresh Food (FF), Packaged Food (PF), Soft Drinks (SD), and Alcoholic Drinks (AD) (% of total calories purchased)

Area	FF	PF	SD	AD
Asia Pacific	57	37	2	4
Australasia	29	56	7	8
Eastern Europe	36	51	4	9
Latin America	34	52	6	8
Middle East and Africa	33	56	5	6
North America	24	63	7	6
Western Europe	21	64	6	9

Sources: Euromonitor International; my survey among 4,800 individuals conducted October 2018.

Table 8 U.S. adults who use an app to track their diet and nutrition (%)

Age group	18–29	30–45	46–60	61+
I use it regularly	29	26	22	14
I use it occasionally	22	22	19	13
I have used it once	14	14	16	20
I can imagine using it	27	31	39	50
I will not use it	8	7	4	3

Sources: Statista; my survey among 4,800 individuals conducted October 2018.

Table 9 Prevalence of usual intakes of sodium exceeding the tolerable upper intake level (%, by sex and age groups)

Age group	Males	Females
2–3	98	94
4–8	97	96
9–13	84	74
14–18	87	52
19–30	82	44
31–50	78	33
51–70	59	27
71+	47	14

Sources: ABS; my survey among 4,800 individuals conducted October 2018.

5. Conclusions and Implications

Personalized nutrition employs data on separate features to advance targeted nutritional guidance, foods, or services to help individuals in attaining a perpetual dietary alteration in behavior that is health-giving (Ordovas et al., 2018), improving dietary metabolic syndrome treatment. (Bashiardes et al., 2018) As a pretreatment gut microbiota biomarker, enterotypes may eventually be a relevant component in personalized nutrition and obesity management. (Christensen et al., 2018) The prevalence and acuteness of ordinary and expensive human diseases may be determined by nutritional vulnerabilities and inadequacies that alter the epigenome, and the predominant intervals of exposure are the periconception phase and early prepubescence. (Skinner et al., 2019)

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