Game Theory and Demonstratives

JP Smit

Please cite the final version, which appeared in Erkenntnis.

Abstract

This paper argues, based on Lewis' claim that communication is a coordination game (Lewis 1975), that we can account for the communicative function of demonstratives without assuming that they semantically refer. The appeal of such a game theoretical version of the case for non-referentialism is that the communicative role of demonstratives can be accounted for without entering the *cul de sac* of trying to construct conventions of ever-increasing complexity. Instead communication *via* demonstratives is explained with reference to the general, non-domain specific ability of human beings to solve games of coordination. Furthermore, there is empirical support for such a view. Judgments concerning demonstrative reference have been shown to be sensitive to judgments concerning *common ground* (Clark et. al. 1983), which is exactly what the non-referentialist account would predict. The game theoretical account also allows for an intuitively plausible, non-referentialist treatment of Speaks' 'trumping argument' (Speaks 2017), as well as the Carnap/Agnew puzzle (Kaplan 1970).

Introduction

This paper concerns the role of demonstratives in communication. I argue, based on Lewis' much neglected claim that communication is a coordination game (Lewis 1975), that we can account for the communicative function of demonstratives without assuming that they semantically refer.

On the non-referentialist view - defended by Bach (2006), Smit (2012), Heck (2014), Nowak (2016) and Leth (2020) - demonstratives have no semantically determined referent, even upon a typical occasion of use, and hence utterances that include them have no truth-evaluable, semantically determined propositional content. While demonstratives do have a linguistic meaning, this does not suffice - even in a specific context of use - to determine semantic reference or content. When appropriately used, however, they do allow the hearer to determine what the speaker has in mind.

The appeal of such a game theoretical version of the case for non-referentialism is that the communicative role of demonstratives can be accounted for without entering the *cul de sac* of trying to construct conventions of ever-increasing complexity. Instead communication *via* demonstratives is explained with reference to the general, non-domain specific ability of human beings to solve games of coordination. Furthermore, there is empirical support for such a view. Judgments concerning demonstrative reference have been shown to be sensitive to

judgments concerning *common ground* (Clark et. al. 1983), which is exactly what the non-referentialist account would predict.

The argument will proceed by showing how the coordination game view deals with Speaks' 'trumping argument' and Kaplan's Carnap/Agnew case (Kaplan 1970). In section one I discuss the trumping argument and in section two I give an initial discussion of the options that the non-referentialist has to deal with the trumping argument. In section three I develop the coordination game view of non-referentialism, in section four I show how it deals with the trumping argument, in section five I discuss some general virtues of the coordination view and in section seven I show how such a view can account for the Carnap/Agnew case.

1   Speaks' trumping argument

Speaks (2016) argues that theories that portray the semantic reference of demonstratives as sensitive to facts about the audience to the uttered demonstrative fail, and instead defends a purely speaker-based view. In a subsequent paper (Speaks 2017), and despite being a proponent of the speaker-based view, he presents the *trumping argument*. The trumping argument attempts to illustrate the difficulties inherent in developing such a speaker-based view.

Speaks' argument depends on a parallel between the rules whereby simple expressions contribute to the content of the complex expressions in which they appear and the Kaplanian character of demonstratives. Both complex expressions and indexical reference exhibit systematicity and productivity (2017: 710). This implies that we need an adequate and internalizable[1] theory of such rules and of Kaplanian characters. Speaks argues that there is good reason to think that there is no such adequate and internalizable theory of the character of demonstratives. This raises a puzzle, for each of the steps in his argument can be seemingly plausibly motivated.

Speaks' general argument contains two steps. The first step is to argue that any viable theory of the character of demonstratives must make reference to the speaker's intention to refer to a specific object (2017: 711 - 719). Hence any adequate and internalizable theory of the character of demonstratives must contain an account of such referential intentions. The second step is to argue that there is no adequate and internalizable theory of such referential intentions (2017: 719 - 732)[2].

The putative phenomenon of 'trumping' concerns cases where a speaker has distinct referential intentions accompanying the use of a demonstrative and

---

[1]The internalizability constraint is the constraint that the rules hypothesized by any viable theory must be *graspable* by language users, i.e. it must not tax language users in a psychologically implausible way (2017: 711).

[2]One may defend the view that speaker's reference has no role to play in determining the semantic reference of a demonstrative by adopting a completely externalist view of demonstrative reference, as done in Gauker (2008). In many ways Speaks' conclusion is grist to Gauker's mill, yet this option will not be considered here. Rather my aim is to defend the non-referentialist against Speaks.

where these intentions apply to distinct objects. A classic case is the example in Kaplan (1970) of a man pointing at a picture he believes to be of Carnap and, without actually looking at the picture, saying "That is a picture of one of the greatest philosophers of the twentieth century". The picture of Carnap, however, has been replaced with a picture of Spiro Agnew. Here the man has conflicting intentions; he *both* intended to refer to the picture of Carnap and to refer to the picture on the wall. Such cases seem to imply that we need a theory of the relative priority of such intentions - a theory of trumping - in order to secure the result that each use of a demonstrative in a context has a determinate and unique semantic referent. The problem, however, lies with providing such a theory of trumping. Speaks argues that theories that are adequate are not internalizable and that the internalizable theories do not seem adequate (2017: 732).

In this paper I tackle Speaks' argument as I think that the coordination game version of non-referentialism has a particularly compelling response to it. One could also, of course, challenge the trumping argument on other grounds. One way to do so would be to challenge the assumption that cases like Agnew/Carnap at all involve the matter of trumping. Instead one could argue, not implausibly, that such cases involve reference failure, with the resulting propositions suffering truth-value gaps. Referentialism about demonstratives is compatible with local failures of reference, and on such a view the trumping argument never gets off the ground. Alternatively, one could object to Speaks' use of the internalizibility requirement. While it is a commonplace that semantic theories need to be internalizable, i.e. graspable, we do not have any sort of theory of what such internalizability amounts to in practice. This renders a core component of Speaks' argument something that can, at present, only be defended by appeals to intuition[3].

The main aim of this paper, however, is to develop the coordination game version of non-referentialism. For present purposes I remain agnostic about the doubts expressed above and take the trumping argument at face-value, independently of such doubts. Whatever its ultimate value may be, the trumping argument does have the merit of directly posing the question as to how we are to account for communicative success using linguistics acts that employ demonstratives in novel contexts. In this paper I aim to show that the game theoretical construal of demonstrative reference has a particularly compelling answer to this question.

The non-referentialist defuses Speaks' puzzle by embracing non-referentialism about demonstratives. If there is no such thing as the semantic referent of a demonstrative (upon an occasion of use), then there also is no problem to solve. Speaks considers the non-referentialist view, and argues that it does not genuinely avoid his puzzle. An analogue of the original problem recurs; while the non-referentialist does not need to give an account of the semantic reference of

---

a demonstrative in a context of use, she does need to give an account of how an interlocutor is to obtain *knowledge* of the speaker's reference in a context of use in order to explain how communication can occur (2017: 733). The problem of productivity arises anew as we need an account of how interlocutors succeed in identifying the speaker's reference of demonstratives in novel contexts. This seems to commit the non-referentialist to offering some analogue of the character of a demonstrative in order to explain our ability to determine the speaker's reference of an utterance. This, in turn, would saddle the non-referentialist with the need to give an account of trumping. Speaks states that the non-referentialist needs to either "find some disanalogy between our competence with novel sentences and novel context/indexical pairs" (2017: 733), and hence avoid the conclusion that these two competences are to be explained in the same way, or give up on the idea that semantic competence is to be explained by an appeal to a compositional, internalizable semantic theory (2017: 733).

In this paper I will argue that there is a basic disanalogy between our competence with novel sentences and our competence with demonstratives as uttered in novel contexts. First, however, we need to consider how the non-referentialist should think about trumping.

2   The non-referentialist and trumping

Speaks' argument that the non-referentialist owes an account of trumping does not pack the punch it appears to. In fact, she may - and arguably should - claim that the phenomenon of trumping does not exist.

Once the link between speaker's reference and semantic reference is denied, it is far from clear that the non-referentialist needs to assign a *unique* speaker's referent to each utterance of a demonstrative. The referentialist who believes that speaker's reference determines semantic reference, and that the Carnap/Agnew utterance semantically refers, has to identify a *unique* speaker's referent (upon an occasion of use) in order to identify a *unique* semantic referent. The non-referentialist, however, does not think that demonstratives semantically refer; *ipso facto* there is then no need for a *unique* speaker's referent. One of the putative theoretical constraints on a theory of speaker's reference, namely uniqueness (upon an occasion of use), is removed as speaker's reference no longer needs to be unique in order to secure unique semantic reference.

If the non-referentialist denies uniqueness, then the problem of trumping is avoided altogether[4]. Situations like the Carnap/Agnew case can be described by saying that the speaker had the intention to speaker-refer to the picture of Carnap, but then subsequently and unknowingly formed the derivative intention to speaker-refer to the picture of Agnew. It is not clear why, once we have described the situation in this way, we should feel compelled to determine

---

[4]Speaks (2016) does not seem to think it unreasonable to deny uniqueness in the Carnap/Agnew case, but denies that such an approach can resolve all cases of conflicting intentions.

who the 'real' speaker's reference of the utterance was; or, for that matter, that there are any facts of the matter left to describe. The hearer of the Carnap/Agnew utterance understands the situation perfectly if he grasps that there are conflicting intentions involved. Furthermore, once he knows this, no good can come from trying to determine which one of the conflicting intentions 'really' determined the speaker's reference. Such a hearer has all the information concerning the situation that could ever be behaviorally relevant. In this way the non-referentialist may simply deny the *datum* motivating the uniqueness requirement, and thereby be freed from giving an account of trumping. Speaks' claim that non-referentialism offers only a 'verbal solution' (2017: 733) goes too far; the non-referentialist has the options of dropping the uniqueness requirement and thereby freeing herself from having to give an account of trumping.

The denial of uniqueness is not, however, the only tack that the non-referentialist can take. The non-referentialist may well wish to preserve uniqueness on other grounds. Such grounds include the fact that the referential intention accompanying 'Carnap' does seem to be of a subtly different kind than the referential intention accompanying 'Agnew', and there may be virtue in taking note of this difference. One such difference is that the intention to speaker-refer to the picture of Carnap was both logically and chronologically prior to the intention to speaker-refer to the picture of Agnew. In fact, the latter was just a misguided way of implementing the former. The priority of the Carnap-intention may lead the non-referentialist to identify the picture of Carnap as the speaker's reference of the utterance, if only because 'the picture of Carnap' would be a less misleading answer to the question 'What where you trying to talk about?'. Such a view would mark a meaningful distinction, but amount more to a useful restriction on our use of the term 'speaker's reference' than to a deep theory of the nature of speaker's reference. It does, however, have some appeal, if only because it seems more in tune with our use of the phrase 'speaker's reference'. Interestingly, this is how Kripke uses the term 'speaker's reference' in his treatment of Donnellan's misdescription cases, as he treats speaker's reference as independent of matters relating to the choice of a designator (Kripke 1977)[5].

Here, again, the non-referentialist is much less constrained than the referentialist. The view that Carnap is the speaker's referent is untenable if speaker's reference also determines semantic reference, as it is implausible that the picture of Carnap is the semantic reference in Kaplan's example[6]. Intuitively, the 'Carnap'-intention is too distant from the linguistic act to govern its application conditions. This is not a problem for the non-referentialist as the link between

---

[5] "[W]e may tentatively define the speaker's referent of a designator to be that object which the speaker wishes to talk about, on a given occasion, and *believes* fulfills the conditions for being the semantic referent of the designator. He uses the designator with the intention of making an assertion about the object in question (which may not really be the semantic referent, if the speaker's belief that it fulfills the appropriate semantic conditions is in error)" (Kripke, 1977: 264, my italics).

[6] The example in Reimer (1991), where the speaker intends to speaker-refer to her own keys but picks up the wrong keys when uttering the phrase 'my keys', makes the matter even clearer. There is no intuition in favor of taking the speaker's keys to be the semantic referent of the utterance.

the speaker's referent and the semantic referent is denied. Speaks' objection that non-referentialism is only a 'verbal solution' (2017: 733) would miss the point. The dialectic that underpins Speaks' objection is hereby avoided, for in such cases, the non-referentialist can accommodate any number of successive chronologically and logically distinct intentions, and identify the first as determining the *speaker's* referent, yet without needing to decide which subsequent intentions 'trump' prior intentions, as claims about speaker's reference no longer need not be sensitive to intuitions (seemingly) about semantic reference.

Non-referentialism, as explained above, has the option of allowing multiple speaker's referents, or insisting on a unique speaker's referent. I follow Kripke in adopting the latter position, for reasons that will be explained at the end of this paper. For now, however, note that Speaks saddles the non-referentialist with a problem that does not back them into any particular corner.

Two challenges, however, remain. First, it would be quite natural to respond to the utterance in the Carnap/Agnew case by saying 'No it isn't, that is Spiro Agnew'. This response treats the the picture of *Agnew* as the topic of conversation; the non-referentialist needs to explain how the picture of Agnew can have the prominence that allows for such a response, despite it being neither the speaker's referent, nor the semantic referent, of the utterance[7]. I will return to this matter at the end of this paper.

The bigger challenge, however, is the problem of giving a non-referentialist account of the productivity of demonstrative utterances. This problem ultimately becomes a matter of giving a theory of the cognitive processes that enable us to use demonstratives as we do. It is to this problem that we now turn.

3 Communication and game theory

3.1 The need for a non-semantic communicative mechanism

Non-referentialists about demonstrative reference deny that demonstratives have a (full) Kaplanian character that serves as their linguistic meaning and that secures a unique semantic referent in a context of use. While demonstratives do have a linguistic meaning and such a linguistic meaning can be seen as a partial specification of a Kaplanian character, their linguistic meaning constrains, rather than fully determines, their communicative role. Demonstratives, to use Bach's phrase, are *character deficient* (Bach 2005: 22).

The non-referentialist view that demonstratives are character deficient implies that the non-referentialist needs to find some *non-semantic* mechanism operative in communication that explains the productivity of demonstrative use. What is this non-semantic mechanism? The answer proposed below is based on the much neglected fact that communication is a coordination game (in the game theoretical sense). Coordination games are generally resolved

---

[7]I would like to thank a referee for pressing me on this point.

by two radically distinct mechanisms, namely conventions and what may be termed 'mutual mind-reading'. What holds for coordination games in general also holds for communication specifically. This leads to the main claim to be defended here, which is that the matter of mutual mind-reading supplies the mechanism needed to explain how such extra-semantic communication involving demonstratives occurs.

The argument is set out in detail below.

3.2   Two mechanisms for resolving coordination games

A game, in the game-theoretical sense, is a situation of interdependent choice. Coordination games are games with multiple equilibria, i.e. multiple states where there is no incentive in favor of a unilateral deviation. Deciding which side of the road to drive on is a paradigm case of a coordination game as driving on the left and driving on the right are both equilibria. Various behavioral aspects of culture are best described as full or partial coordination games, i.e. customs concerning personal space, language use, office hours and so on.

Non-simultaneous[8] coordination games are trivial to resolve as the second mover is incentivized to simply select the action that results in the equilibrium made possible by the action of the first mover. Simultaneous coordination games are resolved using two distinguishable strategies; the first of these is the adoption of a convention governing some particular recurring game. Lewis famously characterized conventions as regularities that arise in response to recurrent coordination games (1969). While there are good reasons to doubt his claim that conventions are regularities, as opposed to rules[9], nothing on the argument here rests on this matter.

In the absence of a convention, all that is left for a rational agent to do is to try and guess what the other agent will do and to act according to their best guess. The situation is the same for all parties; each is trying to guess what the other will do. It is for this reason that I refer to the cognitive process involved here as 'mutual mind-reading'. In using such terminology I commit to no more than the most general principles of folk-psychology, i.e. the view that people have desires and beliefs and act based on such desires and beliefs.

Folk psychology is not inherent to game theory. A theorist may accept the general theory of coordination games, but adopt the quasi-behaviorist 'revealed preference' view first developed in Samuelson (1938) and in so doing avoid any commitment to extra-behavioral states. Such theorists would find the arguments below unpersuasive, but the matter cannot profitably be discussed here. Given that the majority of writers on demonstratives think that the matter of speaker's reference, construed in terms of a specific kind of communicative *intention*, is

---

[8]Despite the terminology, the distinction between simultaneous and non-simultaneous games is not a temporal distinction, but an epistemic distinction. In the non-simultaneous (two person) game, the second mover knows what move the first made, or will make, in the simultaneous game they do not.

[9]See Miller (1992) for an argument that conventions are best classified as rules.

intimately related to demonstrative usage, I trust that this *caveat* does not rob my argument of much interest.

Despite the theoretical option of avoiding folk psychology, in practice game theorists typically *do* consider the mechanism used to resolve coordination games to be a matter of what I have termed 'mutual mind-reading'. The first thing standardly pointed out is that such reasoning in coordination games can iterate to any arbitrary level of complexity. What is best for Alice depends on what Bob will do and *vice versa*, so Alice will reason about what Bob will do, which depends on what Bob *thinks* she will do, which depends on what she *thinks* Bob *thinks* she will do, and so on. There is no rational cap on such iteration, and so the level of iteration involved in the actual reasoning employed will differ based on the cognitive sophistication of the agents involved. Experimental evidence - gathered by presenting subjects with coordination games where one's response depends on the level of iterative reasoning employed - indicates that only a minority of adults typically reason beyond three levels of such iteration (Stahl & Wilson, 1994). However, it remains an open question whether this reflects our cognitive abilities or our estimation of the cognitive abilities of others (Jin, 2018).

Schelling (1960) famously showed that people often resolve (simultaneous) coordination games by choosing the 'salient' solution. The phenomenon of salience is difficult to characterize, but easy enough to recognize. If we give the subjects a square, a triangle, a rectangle, a parallelogram and a complicated, highly irregular shape, then we would expect the irregular shape to be salient. If we give the subjects a list of numbers '1, 3, 7, 9, π, 2, 5', then we would expect π to be picked in virtue of salience, and so on.

Judgments of salience are not a substitute for mutual mind-reading, but rather a strategy that allows such reasoning to terminate. When judgments of salience are used to resolve coordination games they are judgments concerning what is salient *for the parties trying to coordinate*, and as such essentially involves reasoning about other minds. Such judgments are intrinsically judgments as to *mutual salience*.

The above fact explains something important, namely why judgments as to salience vary based on what is *common ground* between the parties trying to coordinate. Clark et al. (1983: 249 - 250) illustrate this point by using the example of two people choosing a salient ball from a collection containing a squash ball, a golf ball and a basketball. Ordinarily we would expect the biggest ball to be salient. If, however, it is common ground[10] between the parties involved that they are keen squash players, this should serve to make the squash ball salient. Here *iterative* mind-reading is essential; choosing the squash ball only makes sense if both parties have a grasp of how the other views the situation.

The centrality of common ground to coordination games is ultimately ex-

---

[10]Clark et al. define 'common ground' as "the mutual knowledge, beliefs, and assumptions shared by the speaker and addressees" (1983: 247). This is not quite Stalnaker's more familiar conception (Stalnaker, 2002: 706), but the intuitive conception given by Clark et. al. will suffice for present concerns.

plained by the fact that such coordination is a matter of mutual mind-reading which aims at predicting which option the other will choose. Rational coordinating agents want the reasoning they use to guide their choice to be *reproduced* by the other party. Such reproducibility can only reliably occur when the reasoning is restricted to reasoning from common ground.

3.3 Communication as a (simultaneous) coordination game

Communication is a simultaneous coordination game (Lewis, 1975). This follows on *any* theory which provides a standard for successful communication and a variety of ways of achieving such success, independently of whether the end-goal of such communication is cognitive or practical. An instance of communication can be described in terms of the communicative act employed and whether successful communication resulted. Let F be the condition that is constitutive of successfully communicating some specific content p. Then the instances of communication featuring communicative act pairs that serve to instantiate F are the equilibria relevant to communicative interactions involving p.

For the purposes of this paper I will accept the transmission view of communication. On the transmission view (also called the 'conveyancing view', the 'standard view' or 'encryption-decryption model') communication involves a speaker identifying some content that they wish to convey and then using a communicative act in order to do so. Successful communication results when the hearer grasps the content that the speaker wishes to convey.

The transmission view is popular and intuitive, yet not without critics. The main source of criticism[11] is that it portrays mental content as prior to linguistic content[12]. This foundational issue, unfortunately, can only be noted here. Nothing, however, in Speaks' argument depends on a rejection of the transmission view.

On the transmission view the situation of speaker and hearer are interestingly reversed. The speaker knows the *content* that she would like to convey, and has to choose a communicative act that will do so successfully. The hearer is confronted with the *communicative act*, and has to determine which content the speaker is trying to convey. Both parties have one piece of the act/content puzzle and have to coordinate to find the other half.

The above considerations render communication a coordination game in the same sense as deciding which side of the road to drive on is a coordination game. In both scenarios we have multiple possible outcomes that constitute equilibria (i.e. states of successful communication are equilibria in the same sense that states where cars avoid one another are equilibria in the driving case), i.e. where the pay-offs of these states outrank the pay-offs of other possible states for all parties involved.

---

[11]One could also reasonably object to that speakers always have determinate content in mind and that what the hearer grasps must be identical to such content. See, for instance, Buchanan (2010: 346 - 352). These claims, however, could be weakened without affecting the structure of the transmission view.

[12]See Gauker (2002, 2007) for a criticism of this aspect of the transmission view.

One conceptual oddity, which originally led Lewis to deny that communication is a coordination game in *Convention* (1969), concerns the hearer's input in the process of coordination. In a typical coordination game both parties are performing some action. The hearer, however, is not acting, but *forming beliefs* about what the speaker is trying to convey. Communication, however, remains a coordination game, for the relation between the speaker's action and the hearer's doxastic process is that of a coordination game. It is constitutive of a coordination game that the *success condition* of one party's action is determined by the other party's action, i.e. my driving on the left makes it the case that you should too, and *vice versa*. The same relation obtains between the speaker's action in choosing an act/content pair and the hearer's belief that a specific act/content pair obtains; both parties set the success condition of the other in choosing/believing *qua* communicative act pairs.

Lewis' denial that communication is a coordination game is explicitly reversed in 'Language and languages', and for reasons similar to those discussed above (1975: 10 – 12). He affirms both the nature and the importance of understanding language in this way when he states that the *primary* form of coordination operative in communication is the coordination between the speaker and the 'responsive believing' of the hearer (1975: 11).

Coordination games in general can be resolved by conventions or mutual mind-reading, and communication is no exception. Communication can occur by mutual mind-reading alone, by some mixture of mind-reading and conventions, or by conventions alone. If Alice asks Bob to lend her £10 and Bob turns and walk away, then no linguistic convention has been utilized in communicating that Bob will not perform the favor. Here communication happens by mind-reading; walking away is a communicative action that allows for a Gricean (Grice 1957) explanation in terms of the recognition of Bob's reflexive intention to deny the request.

Communication can also occur in virtue of some mixture of conventions and mind-reading. Many semanticists believe that an utterance like "Tipper is ready" does not serve to semantically determine what is communicated in a typical context of use[13]. Yet a knowledge of the conventions governing English, added to some mind-reading based on contextual cues, serve to let such an utterance communicate truth-conditional content (like "Tipper is ready *for tennis*").

Communication can also occur, or seem to occur, in virtue of conventions alone. If Bob answers Alice's request for money by uttering the sentence "No, I will not lend you £10", then the conventions governing the syntax and semantics of English serve to determine the content of his refusal of the request. Even in such a case, however, the matter of mutual mind-reading is not entirely absent. On the conveyancing view, as the communicative act is not complete until Alice *infers* that the semantically determined proposition is also the proposition that Bob wished to convey.

---

[13]See Carston (2008) for a survey of views on demonstratives and a fine defense of her own view.

4 Answering Speaks' challenge to the non-referentialist

4.1 Communication using demonstratives as a matter of mutual mind-reading

The above reasoning indicates that the non-referentialist can explain communication that utilizes demonstratives by appealing to the *non-semantic* mechanism of mutual mind-reading. To see how such an account would go, consider Alice, a professor in class handing back the graded assignments of students. She hands an assignment to her student Bob, and utters 'This is excellent'. The non-referentialist about demonstratives will maintain that the demonstrative 'this' does not semantically determine a unique object. The linguistic convention governing 'this' merely serves to indicate that there is something that Alice wishes to speaker-refer to[14].

Demonstratives, so characterized, are character deficient. As such their use in communication involve a process of mutual mind-reading in order for Alice to make manifest, and for Bob to determine, what Alice wishes to speaker-refer to. Assume it is common ground between Alice and Bob that Alice is handing out assignments, that she graded the assignments, that Alice generally verbally comments on assignments when handing them out, that they both have the typical cognitive capacities, that handing the assignment to Bob makes it mutually salient, and so on. A particularly important fact attending Alice's utterance is that it is common ground that Alice *could* have made her intention explicit by utilizing linguistic conventions, *yet chose not to* do, as this allows Bob to infer that Alice thinks that the communicative context is sufficient to infer her communicative intention.

The above situation features a *mutually* salient object (the paper); Alice's *not* stating her intention more elaborately makes it clear that she intends to speaker-refer to it. These facts guide both Alice's communicative action and guide Bob's interpretive activity. Such facts serve as scaffolding that allow communication to take place; Bob can reasonably interpret her as communicating that Bob's assignment is excellent and Alice can reasonably expect him to do so. In this way communication takes place with no semantic reference at all. Rather the communicative slack is taken up by a pragmatic process that utilizes the general, non-domain specific ability of human beings to resolve coordination games.

4.2 Empirical support for the coordination game view

In 1983, a team led by the well-known psycholinguist Herb Clark ran a series of experiments to test intuitions about demonstrative reference (Clark et al. 1983). They do not explicitly characterize communication as such as a coordination game. Yet they take their inspiration from Schelling; they ingeniously show that subjects will tend to make the *same judgments* about demonstrative reference

---

[14]Nothing here depends on how we construe the semantics of 'this' in order to secure this result. See Smit (2012) or Nowak (2016) for distinct options.

as they do when confronted with a general, *non-linguistic* 'Schelling task', i.e. coordination game, that offers the same options and contextual cues as the case concerning demonstrative reference. Given such evidence as to the cognitive processes involved in demonstrative reference, they reject the view that there is some mechanical rule that serves to link a demonstrative, the demonstration (i.e. a gesture) accompanying it and the object referred to (1983: 245).

Clark et al. do not take their work to establish non-referentialism about demonstrative reference. This is not to say that they deny it; they are linguists and the categories of semantic reference and propositional content, as used in philosophical logic and the philosophy of language, are not among those they employ. Strictly speaking, it is not their view of 'reference', in our sense, that is at issue here. Rather the relevance of their work for the current discussion is due to their claim that the cognitive processes triggered by the use of a demonstrative is similar to the cognitive processes involved in the resolution of a 'Schelling task'.

The first of the conducted experiments relevant here concerned several displays of pictures of a common type (watches, lamps, etc.). Subjects were shown a specific display, and asked 'What do you think of this X?', where X is some category (watches, lamps, etc.) of object (1983: 250). The subjects were then asked which object they took the questioner to be referring to. A distinct group of subjects were given the same display, and given the non-linguistic task of acting as a party in a coordination game, i.e. asked to pick the object that most subjects would picked (1983: 250).

The results were, first, that one object from the class was picked much more often than the rest in all cases across both tasks; second, that this object was always the most perceptually salient one; and third, that there was a very high degree of correlation between the objects identified in task one (concerning demonstratives) and task two (concerning *non-linguistic* coordination) (1983: 251 – 253). This strongly supports the view that communication *via* demonstratives utilizes the same cognitive mechanism that we use to resolve coordination games in general.

The next experiment again involved one task concerning demonstrative reference and one concerning coordination as such. Here, however, subjects were told that the question 'What do you think of X?' was asked by a questioner looking to buy a gift for either a thrifty, middle-aged man, or for a young, jet-setting woman. The coordination task was stated as a matter of coordinating with one of these two respective individuals (1983: 254).

Objects identified in the demonstrative task concerning the middle-aged man were highly correlated with objects identified in the non-linguistic coordination task involving the middle-aged man. Similarly, objects identified in the demonstrative task concerning the young woman were highly correlated with objects identified in the non-linguistic coordination task involving the young woman (1983: 254 – 255). Yet the objects identified in cases involving the middle-aged man *differed systematically* from the objects identified in cases where the young woman was involved (1983: 255). This, again, strongly supports the claim that the same mechanism was involved in judging the reference of a demonstrative as

was used in the *non-linguistic* coordination task. More importantly, it strongly supports the claim that such judgments are sensitive to changes in the common ground (in this case, about who the gift is for), including matters concerning the aims of those trying to coordinate.

The next experiment presented subjects with a picture of Ronald Reagan standing next to the much less well-known bureaucrat David Stockman. Subjects were asked either 'You know who this man is, don't you?' or 'Do you have any idea at all who this man is?' (1983: 256). The first question communicates the presupposition that the person the speaker is asking about is famous, the latter communicates the presupposition that the person the speaker wishes to talk about is not-well known. Almost all subjects who were asked the first question took the speaker to be asking about Reagan. Significantly more subjects took Stockman to be the relevant person when the second question was asked. (1983: 257). This, again, strongly indicates that subjects were led by non-semantic facts concerning common ground, in this case the speaker's presuppositions, when trying to determine the referent of the demonstrative.

Clark et al. wished to demonstrate the role of common ground in determining demonstrative reference by showing that the reasoning used is analogous to the reasoning employed in coordination tasks. Their findings fit perfectly with the game theoretical construal of demonstrative reference. First, we should expect that such reasoning is analogous to that used in coordination games, as communication is *a type* of coordination game. Second, reasoning that is sensitive to matters of common ground is necessarily a matter of reasoning about the perspective of others, i.e. what has here been termed iterative mutual mind-reading. Third, their finding that a variety of factors (perceptual salience, the speaker's goals, linguistic meaning and what is presupposed (1983: 257)) can influence how a demonstrative is interpreted is, again, exactly what we would expect if the relevant cognitive mechanism is one of mutual mind-reading based on common ground. This is because *any* fact can potentially be part of the common ground relevant to trying to determine what is in the mind of another when trying to coordinate. In fact, in the literature that philosophers of language are more familiar with, Heck has forcefully argued for the same claim, namely that any fact can be relevant to the interpretation of communicative acts that involve demonstratives (Heck 2014).

On the non-referentialist construal, the role of common ground in such communicative coordination is not to fix speaker's reference or semantic reference. Instead common ground guides the speaker in the selecting the utterance that will serve to make their communicative intention plain, while similarly guiding the hearer in their coordinating task of, as was explained in the discussion of Lewis, 'responsive believing'.

The experiments in Clark et. al. provide empirical support for the claim that our reasoning involving demonstratives does not take the form of trying to determine the value of a Kaplanian character. Rather, we employ a non-semantic form of reasoning, i.e. mutual mind-reading involving facts about common ground, that we use to resolve coordination games generally. This, then, allows us to resolve Speaks' puzzle. The productivity of demonstrative

usage in novel contexts is to be explained, not by some subtlety as to the character of demonstratives, but in virtue of the existence of our general capacity for mutual mind-reading.

5   The coordination game view and non-referentialism

The claim that our communicative practices exploit non-semantic mechanisms in order to deliver truth-evaluable entities (i.e. above and beyond what is needed to account for Gricean implicatures) should, among a large number of theorists, not be overly controversial. A lot of semanticists are already committed to the existence of such a mechanism. Non-propositionalists about semantic content, i.e. those who deny that sentences typically semantically express truth-evaluable entities (e.g. Neale, (2004), Carston (2008), Bach, (1994), Soames (2009)) stand in need of such a mechanism in order to arrive at the truth-evaluable entity that is the subject of communication. Similarly, minimalists (e.g. Cappelen & Lepore (2005), Borg (2004)), while claiming that sentences typically do express truth-evaluable entities, deny that such minimal content is what is typically communicated. Hence they similarly stand in need of a non-semantic mechanism in order to explain how the communicatively relevant truth-evaluable entity attending an utterance is determined and communicated[15].

Constructing a game-theoretical theory of such a non-semantic mechanism has four main virtues when developing non-referentialism about demonstratives.

First, it allows the argument to be stated in terms of our *general* capacity for coordination, the existence of which is mostly uncontroversial. Second, it starts from a premise that, while neglected, should be seen as truistic, namely that communication is a coordination game. This allows for insights from game theory to be applied to semantics. Third, it coheres seamlessly with the empirical work done by Clark et al. (1983) and gives a plausible explanation for the fact that all manner of facts can influence our intuitive judgments as to what a demonstrative refers to (Heck 2014).

The coordination game approach also allows the intuitive appeal of the non-referential view to come sharply into focus. Coordination games in general are resolved by conventions and mutual mind-reading. These two mechanisms are very different; mutual mind-reading is an (iterative) process of agent-involving reasoning utilizing common ground, whereas conventions are typically simple mechanical rules or regularities. Given that demonstrative reference has been shown to involve such mutual mind-reading, communication involving demonstratives looks *exactly* like a process involving the non-conventional mechanism we generally use to resolve coordination games and *nothing* like a matter of

---

[15]Even those who do think that there is a lot more to semantic content than meets the eye, arguably still need some sort of non-semantic mechanism in order to account for how such content is determined. This, at least, is the charge made by Neale (2007) against Stanley (2000). Stanley holds that utterances typically do semantically express truth-evaluable entities and that such entities are fully determined by syntactically triggered processes. Neale plausibly argues that, even if all this were true, processes that look suspiciously pragmatic are still needed in order to arrive at truth-evaluable entities (2007: 81 – 82).

convention-following. Hence, assuming we follow Kaplan in equating *semantic* content with *conventionally determined* content[16], the game theoretical view provides strong intuitive support for the view that demonstrative reference is not a matter of semantics, i.e. that demonstratives do not semantically refer.

The only way for the referentialist to accommodate our intuitions about the reference of demonstratives, and yet avoid the above conclusion, is to argue that the conventions governing demonstratives are extraordinarily complicated conventions that make reference to, or presuppose, the concepts typically associated with coordination games. Some current theories effectively do exactly this in making explicit reference to the parties involved in a communicative interaction and/or making reference to cognitive processes (e.g. King (2013, 2014), Speaks (2016), Mount (2008), Ciecierski et. al. (2022))[17]. King (2013, 2014) goes as far as to incorporate aspects of common ground into his theory, whereas Mount (2008) defends the idea that the semantic reference of a demonstrative is the object of maximal mutual salience[18]. Such views make it seem like elements of game theory are slowly being incorporated into theories about demonstratives, even if the issue is not being recognized in such terms.

Once, however, we truly appreciate the nature of coordination games - and the *radically* distinct ways in which they can be resolved - we should be led to the view that such theories, while on the right track, still fundamentally misunderstand their objects. Referentialist theories that incorporate aspects like the speaker and hearer, common ground and salience must portray demonstrative reference as involving some of the most complicated linguistic conventions ever found. The non-referentialist, by contrast, portrays communicative acts involving demonstratives as involving no more than the *standard* mechanism, i.e. mutual mind-reading, which is used to resolve *exactly* the class of games to which communication belongs. In denying that demonstratives semantically refer, the non-referentialist cuts the Gordian knot and offers a simple and intuitive view of how demonstratives are used to communicate.

More importantly, the referentialist cannot endorse the coordination game account of communicative acts that use a demonstrative without encountering the basic question of why the matter of *semantic* reference is thought to be relevant at all. For, once the coordination game account is accepted, a non-referentialist construal of the semantics of demonstratives is sufficient to account for how we communicate by using demonstratives. But then there is nothing left to explain. Furthermore, the role of the speaker and hearer, and the related

---

[16]"The character of an expression is set by linguistic conventions and, in turn, determines the content of the expression in every context." (Kaplan 1989: 505).

[17]Much of what is said by these authors about the relevant cognitive processes would survive, and remain interesting, if their views are recast as non-referentialist.

[18]In my original defense of non-referentialism (Smit 2012), I argue that the idea of conventions that make reference to matters like common ground and salience fails on two separate grounds. Firstly, it clashes with the constraint that we can expect linguistic conventions to be efficient. Any such conventions effectively advise speaker and hearer to engage in reasoning processes that they would have engaged in anyway, just in virtue of the pragmatics of communication. Furthermore, no action could count as following such a convention and so the very idea of such conventions commits a kind of category mistake.

matters of common ground and salience, are all accounted for by the fact that communication is a coordination game; reintroducing these concepts into the very semantic *convention* governing the demonstrative so as to secure a semantic referent does nothing except add an epicycle to save a dogma.

One could object to the above picture by pointing out that whatever complexity in the formulation of a convention is avoided by the non-referentialist, is once again incurred in their construal of the pragmatics of a communicative acts involving demonstratives[19]. This is so, but the complexity is much easier to motivate in the case of the non-referentialist. On the mind-reading view of communication this complexity will have to be admitted anyway when dealing with pragmatics and, more importantly, coordination in general. This complexity is not new, and the source of such complexity is easily explained. It is, as was explained before, in the nature of coordination that any fact of reality can serve to guide coordinating behaviour. In the case of the referentialist, however, it is hard to see a similar account of why we would expect there to be a class of linguistic items with conventionally associated rules that are complex in this way.

6   Carnap and Agnew

There is one loose end that needs to be dealt with. Our intuitive response to the Carnap/Agnew case is to say that, while Carnap is the speaker's referent, Agnew is the semantic referent. This is the core problem that originally raised trouble for intentionalist theories and gave rise to the trumping problem. What should the non-referentialist say about any lingering intuition to the effect that Agnew is the semantic referent in such a case?

To address this, start by noting that all non-propositionalists, i.e. Carston, Bach, Soames, Neale and others, are implicitly committed to the idea that our intuitive responses concerning truth-values, etc. do not relate to semantic content. For then they cannot account for the fact that a statement like 'I am ready' (as opposed to 'I am ready to go play tennis now') can be judged to be true, yet their theories predict that it does not serve to semantically determine a proposition with a truth-value. Instead they would have to say that our intuitions in such cases do not track purely semantic facts, but rather track some other entity[20], for example the proposition the speaker intended to communicate. The same would go for logic; intuitive judgments that arguments featuring claims that, on a non-propositionalist account, turn out to not semantically determine propositions with truth-values, would have to be explained by saying that such judgments pertain to non-semantically determined entities. Here the non-referentialist is in the same boat as the non-propositionalist. The non-referentialist would have to explain the Agnew intuition as pertaining to some non-semantically determined entity.

---

[19]I would like to thank an anonymous referee for pressing me on this point.

[20]Carston (2002) explicitly claims that our intuitions do not relate to semantic content

The game theoretical construal of demonstrative reference points the way to an elegant way of explaining the prominence of Agnew, yet without affirming Agnew to be the speaker's referent or semantic referent of the relevant utterance. To explain this claim, start by remembering how the need for semantic conventions originates. We do not have unmediated access to the minds of others, hence conventions arise so as to guide the speaker in their choice of words and to guide the reader in their interpretive efforts. This also explain why a so-called Humpty Dumpty semantics, in which words just mean what I want them to mean, is impossible. Such a semantics cannot be used to communicate as it provides no expressive guide to the speaker or interpretive guide to the hearer. These considerations, however, do not only apply to semantics. They also apply to pragmatics, for *a Humpty Dumpty pragmatics is similarly impossible.* Communicative actions that utilize pragmatic criteria cannot be of use unless there are standards that guide the speaker in their choice of communicative act and these same standards are used by the hearer in their act of interpretation. This is the key point driving the work of Grice (1957).

The above reason indicates that we can define a *species* of reference that is in accord with all operative public standards, i.e. *both* the conventional rules and the pragmatic standards operative in a given situation. Call the object determined in virtue of all such public standards immanent to a specific communicative situation the *public referent* (or manifest referent). If we apply this idea to demonstratives, the non-referentialist view becomes the view that, while conventions do play a role in communicative acts involving demonstratives (as the term 'that' does have a linguistic meaning), these conventions do not serve to determine a unique semantic referent. Yet pragmatic criteria take up the communicative slack in determining the *public referent* of an utterance of a demonstrative, and that is all we need.

Giving a full characterization of the standards determining public reference is well beyond the scope of the paper[21]. For our purposes it will suffice to simply point out that the need for the notion of public reference follows straightforwardly from the recognition of the fact communication involving pragmatic mechanisms rely on extra-individual standards. Both speaker and hearer can implement these standards incorrectly (or in a non-standard way), and so the public referent will not always coincide with the speaker's referent.

Note that public reference will also, in the case of linguistic items that do secure semantic reference, not always coincide with *semantic* reference. Take, for example, names. Consider a case of a confused undergraduate who uses 'Popper', when wishing to speaker-refer to the author of *The Structure of Scientific Revolutions*, i.e., but who has heard that this book was written by an anarchist philosopher who taught at Berkeley. The student says "Popper's anarchism could only have been taken seriously in a place like Berkeley". All the world will take the speaker to be trying to talk about Feyerabend, as the publicly available evidence strongly suggest that the person thinks that Feyerabend

---

[21]For use of the notion of public reference in the debate in arguing for non-referentialism, see Smit (2012). For an exploration of the broader relevance of the notion, see Smit (2018).

is called 'Popper'. In such a case Kuhn is the speaker's referent of the utterance, Popper remains the semantic referent and Feyerabend is public referent of the utterance. The addition of the public referent in such a case captures the fact that, when someone evidently makes a mistake, the evidence as to who they wish to talk about can be misleading in a way that it makes someone who is not the speaker's referent, nor the semantic referent, relevant to the conversational interaction[22].

The suggested non-referentialist treatment of the Carnap/Agnew case should now be apparent. Any intuition to the effect that Agnew is the semantic referent of the utterance is due to the fact that Agnew is the *public referent* of the utterance, added to the conflation of semantic reference and public reference. The speaker in the Carnap/Agnew implemented public standards of communication incorrectly and their mistake was in no way public, i.e. apparent to any observer. Hence, while the speaker's referent of their utterance remained unaffected by their mistake, the public referent diverged from the speaker's referent as it is picked out in virtue of public (non-hidden) criteria.

On the non-referentialist view, the conventionalist is correct to insist that Agnew is the entity picked out by public standards, but then errs in construing such standards as conventional (semantic), instead of pragmatic. The intentionalist is correct to doubt that the conventionalist can come up with a public convention that serves to explain demonstrative reference, but wrong to think that the answer is to construe the convention as involving referential intentions. What both referentialist sides miss is that, while something about the case makes Agnew manifest, this is due to pragmatics, not semantics. Once this is grasped, the notion of public reference allows the non-referentialist to give an intuitively plausible treatment of the Carnap/Agnew case. In fact, the importance of the notion will presumably be more general as allied notions (public proposition, public argument[23], etc.) can be constructed in order to aid non-propositionalists in their efforts to explain our intuitive judgments about the truth-values of utterances (and the validity of arguments) in cases where no semantically determined truth-values are to be found. This, as the Carnap/Agnew case makes clear, is preferable to portraying the entity that our intuitive judgments pertain to as the intended referent (and intended proposition, intended argument, etc.).

7 Conclusion

Lewis' claim that communication is a coordination game has not found much traction among philosophers writing about demonstratives and similar phenomena[24]. Even theorists who use the *term* 'coordination' give no indication of

---

[22]Defining what such public standards are will involve a full characterisation of the complexities of pragmatics. Such complexity is unavoidable; in the previous section I explained why I think that such complexity should be located within pragmatics, and not semantics.

[23]I am grateful to Jan Heylen for pointing out the extension to logic out to me.

[24]There is, however, an intellectual tradition, originating in Parikh (1991), within Linguistics that model phenomena like Gricean implicatures game theoretically. Interestingly, they

viewing communication as a coordination game, in the specific sense here employed. I do not know if this is because theorists side with Lewis' denial of the claim that communication is a coordination game, or because they agree with Lewis, but think that such a claim does not have much practical implication for their debates. Most likely game theory is simply not part of how most theorists think about demonstratives. I hope to have shown that the concepts used in game theory can provide a principled and fruitful framework for thinking about the relation between semantics and pragmatics. It is for this reason that I characterize the later Lewisian view as neglected. Such neglect is unfortunate, as it offers the option of explaining communication that utilizes demonstratives as succeeding in virtue of a non-semantic mechanism, namely the type of mutual mind-reading that we generally use to resolve coordination games. The fact that communication is a kind of coordination game, coupled with intuitive and empirical data showing that our use of demonstratives are sensitive to matters of salience and common ground, strongly suggest that demonstrative reference should be explained in this way.

Communication is just one coordination game among many. In the same way, semantics (i.e. linguistic convention) is an instance of the way in which human beings achieve coordination *via* conventional means, and pragmatics is an instance of how human beings achieve coordination *via* non-conventional means. It is for this reason that game theory provides a useful way of making sure that our work is consistent with, and responsive to, considerations that arise in virtue of the kind of thing that we are studying when we study communication.

References

[1] Bach, K. 1994. Semantic slack: what is said and more. In Tsohadzidis, S. (Ed.) 1994. *Foundations of Speech Act Theory*. Routledge.

[2] Bach, K. 2005. Context *ex machina*. In *Semantics vs. Pragmatics*. Szabó, Z. (Ed.) Oxford University Press. 22 - 44.

[3] Bach, K. 2006. What does it take to refer? In Lepore, E. & Smith, B. (Eds.) *The Oxford Handbook of Philosophy of Language*. 516–554. Oxford University Press.

[4] Borg, E. 2004. *Minimal Semantics*. Oxford University Press.

[5] Buchanan, R. 2010. A puzzle about meaning and communication. *Noûs*. 340 – 371.

[6] Cappelen, H. & Lepore, E. 2005. *Insensitive Semantics. A Defense of Semantic Minimalism and Speech Act Pluralism*. Blackwell Publishing.

typically take their inspiration from the signaling games in Lewis' *Convention*, i.e. games where players are trying to influence action, rather than from his later construal of communication in purely cognitive terms. Franke (2013) is an excellent introduction to the field.

[7] Carston, R. (2002). *Thoughts and Utterances: The Pragmatics of Explicit Communication.* Oxford: Blackwell

[8] Carston, R. 2008. Linguistic communications and the semantics/pragmatics Distinction. *Synthese.* 165: 321-45.

[9] Ciecierski, & T. Makowski, P.T. 2022. Demonstrations as actions. *Synthese.* 200: 467. https://doi.org/10.1007/s11229-022-03942-1.

[10] Clark, H., Schreuder, R., & Buttrick, S. 1983. Common ground and the understanding of demonstrative reference. *Journal of Verbal Learning and Verbal Behaviour.* 22: 245 – 258.

[11] Franke, M. 2013. Game theoretic pragmatics. *Philosophy Compass.* 8: 269 - 284.

[12] Gauker, C. 2002. No conceptual thought without language. *Behavioral and Brain Sciences.* 25: 687 – 687.

[13] Gauker, C. 2007. On the alleged priority of thought over language. In Tsohatzidis, S. (ed.) *John Searle's Philosophy of Language: Force, Meaning, and Mind.* Cambridge University Press. 125 – 142.

[14] Gauker, C. 2008. Zero tolerance for pragmatics. *Synthese.* 165: 359 - 371.

[15] Grice, H. P. 1957. Meaning. *The Philosophical Review.* 66: 377 - 388.

[16] Heck, R. 2014. Semantics and context dependence. In Burgess, A. & Sherman, B. (Eds.) *Metasemantics: New Essays on the Foundations of Meaning.* 327 – 364. Oxford University Press.

[17] Jin, Y. 2018. Does level-k behavior imply level-k thinking? Working paper, U.C. Berkeley.

[18] Kaplan, D. 1970. Dthat. *Syntax and Semantics.* 9: 221–43.

[19] Kaplan, D. 1989. Demonstratives. Almog, J, et al. (eds.) *Themes from Kaplan.* Oxford University Press.

[20] King, J. 2013. Supplementives, the coordination account, and conflicting intentions. *Philosophical Perspectives.* 27: 288-311

[21] King, J. 2014. Speaker Intentions in Context. *Noûs.* 48: 219–37.

[22] Kripke, S. 1977. Speaker's reference and semantic reference. In *Midwest Studies in Philosophy.* 2: 255-276.

[23] Leth, P. 2020. Speakers, hearers and demonstrative reference. Ciecierski, T and Grabarczyk, P (eds). *The Architecture of Context and Context-Sensitivity Perspectives from Philosophy, Linguistics and Logic.* Springer.

[24] Lewis, D. 1969. *Convention: A Philosophical Study*. Harvard University Press.

[25] Lewis, D. 1975. Languages and language. Keith Gunderson (ed.) *Minnesota Studies in the Philosophy of Science. Volume VII*. University of Minnesota Press, 3–35.

[26] Miller, S. 1992. On conventions. *Australasian Journal of Philosophy*. 70: 435 – 444.

[27] Mount, A. 2008. Intentions, gestures, and salience in ordinary and deferred demonstrative reference. *Mind and Language*. 23: 145–64

[28] Neale, S. 2004. This, that and the other. Bezuidenhout, A. & Reimer, M. (Eds.) *Descriptions and Beyond*. Oxford University Press. 68-182.

[29] Neale, S. 2007. Heavy hands, magic and scene-reading traps. *European Journal of Analytic Philosophy*. 3: 77 – 132.

[30] Nowak, E. P. 2016. *Two dogmas about demonstratives*. UC Berkeley: Philosophy. Retrieved from: http://escholarship.org/uc/item/6334687r

[31] Parikh, P. 1991. Communication and strategic inference. *Linguistics and Philosophy*. 14: 473–514.

[32] Reimer, M. 1991. Demonstratives, demonstrations, and demonstrata. *Philosophical Studies*. 63, 187–202.

[33] Samuelson, P. 1938. A note on the pure theory of consumer's behaviour. *Economica*. 5: 61 - 71.

[34] Schelling, Thomas. 1960. *The Strategy of Conflict*. Harvard University Press.

[35] Smit, J.P. 2012. Why bare demonstratives need not semantically refer. *Canadian Journal of Philosophy*. 42: 43 – 66.

[36] Smit, J. P. 2018. Speaker's reference, semantic reference and public reference. *Stellenbosch Papers in Linguistics Plus*. 55:133-143, doi:10.5842/55-0-777.

[37] Soames, S. 2009. The gap between meaning and assertion: why what we literally say often differs from what our words literally mean. In Soames, S. *Philosophical Essays, Volume 1: Natural Language. What it Means and How We Use It*. Princeton University Press.

[38] Speaks, J. 2016. The role of speaker and hearer in the character of demonstratives. *Mind*. doi:10.1093/mind/fzv195

[39] Speaks, J. 2017. A puzzle about demonstratives and semantic competence. *Philosophical Studies*. doi:10.1007/s11098-016-0704-5

[40] Stahl, D & Wilson, P. 1994. Experimental evidence on players' models of other players. *Journal of Economic Behavior and Organization.* 25: 309 - 327.

[41] Stalnaker, R. 2002. Common ground. *Linguistics and Philosophy.* 25: 701 – 721.

[42] Stanley, J. 2000. Context and logical form. *Linguistics and philosophy.* 23: 391 – 434.