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Fiction and common ground

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2 Common ground: *In sensu composito* or *in sensu diviso*

This chapter is a rewritten and expanded version of ‘Common ground: *In sensu composito* or *in sensu diviso*’ in *Proceedings of 22nd Amsterdam Colloquium*. The most substantial differences between this chapter and the proceedings paper include: First, an expansion of the discussion of the notion of common ground and its traditional definitions (section 2.2.1). Second, the addition of a brief discussion of previous challenges concerning the inapplicability of these traditional definitions to cases of real-life communication (section 2.3.1). Third, the addition of a discussion of the different notions of felicity resulting from the proposed common ground definitions (section 2.5.1).

2.1 Introduction

The central aim of this dissertation is to model our engagement with fiction in Stalnaker’s (1970, 1978, 1984, 2002) pragmatic framework, i.e., in terms of what is and what isn’t ‘common ground’ between interlocutors. To prepare the way for the application of the notion of common ground to the case of fiction in subsequent chapters, I will first focus solely on exploring and refining this notion in the current chapter. Several challenges to traditional common ground definitions will first have to be addressed, including especially a novel challenge that I introduce concerning conversational participants that are not acquainted with each other. Traditional ‘textbook’ definitions of common ground are based on face-to-face conversations where people have iterative attitudes towards each other. For instance, we can define common ground as common belief: p is common ground between a and b iff a believes that p , b believes that p , a believes that b believes that p , b believes that a believes that p , etc. However, note that if a believes that b has

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a certain belief, this means that *a* has a belief about her interlocutor *b*. This is problematic because the concept of common ground has – without much hesitation – been extended to non-face-to-face communication (e.g., [Stokke \(2013\)](#); [Eckardt \(2014\)](#); [Semeijn \(2017\)](#); [Maier and Semeijn \(forthcoming\)](#); [Zucchi \(forthcoming\)](#)) in which the speaker is known to the hearer but the hearer is not known to the speaker, such as books, broadcasted speeches or blogposts.¹ For instance, it is common ground between biographer Ray Monk and myself that Wittgenstein was Austrian. However, definitions of common ground in terms of attitudes towards one's interlocutor do not apply to this type of communication; I may have beliefs about Monk but obviously Monk does not have beliefs about me. Monk merely has beliefs about the beliefs of 'the reader(s)', whoever that may be. It would follow that there could never exist any common ground between Monk and his readership. This is unsatisfactory since Monk and myself *do* seem to respectively produce and interpret the biographical text against a background of shared assumptions.

Non-face-to-face conversations pose a challenge to anyone who wants to formulate an account of our engagement with fiction in terms of common ground. If you want your account of fiction to not only apply to face-to-face 'around the campfire' fiction telling, but also apply to more stereotypical cases of fiction telling such as Tolkien's fictional novel writing, you will have to assume a notion of common ground that can be extended to non-face-to-face communication. The central aim of this first chapter is thus to get this basic challenge posed by non-face-to-face communication out of the way so we can proceed in subsequent chapters to analyse our engagement with fiction in terms of common ground. I will restrict the discussion in this chapter to cases of non-fictional conversations. If the reader is primarily interested in semantics of fiction, they may continue with section 2.2, skip the rest of the current chapter and – for the rest of the dissertation – rely on an intuitive understanding of something being common ground between people that are not acquainted.

I first discuss the concept of common ground and its role in Stalnaker's pragmatic framework (section 2.2). Second, I briefly discuss three challenges that have previously been posed to traditional common ground definitions

¹I use the terms 'speaker' and 'hearer' for, respectively, the person that produces some communicative act (e.g., by saying it or by writing it down) and the person that receives and interprets the communicative act (e.g., by hearing or reading it).

(Section 2.3.1). Next, I spell out a novel challenge to traditional common ground definitions posed by non-face-to-face communication using a relational analysis of *de re* belief that makes explicit the acquaintance relations involved in *de re* beliefs (Section 2.3.2). Next, I introduce Abelard's distinction between generality *in sensu composito* and *in sensu diviso* and, in line with this distinction, propose two potential refinements of common ground definitions (Section 2.4). I discuss how we obtain two essentially different notions of the felicity of speech acts on the two definitions and, finally, show how the case of an acquaintance that hasn't revealed themselves as a conversational participant may aid us in deciding between the two definitions (Section 2.5).

2.2 Common ground

2.2.1 Common ground and assertions

The notion of common ground not only is a key concept in pragmatics, but it (and related notions such as 'mutual belief', 'mutual knowledge' or 'joint attention') also plays an important role in other fields including philosophy (e.g., Friedell (1969); Lewis (1969); Schiffer (1972)), epistemic logic and computer science (e.g., Fagin et al. (1995); Meyer and Van der Hoek, (1995)) in explaining how agents can coordinate their actions.² For instance, we avoid multiple collisions in traffic because it is *common* belief between drivers that they should drive on the right side of the road; it's not enough if all drivers mutually believe that drivers should drive on the right. To coordinate action they must also believe that the other drivers believe this, etc.

Stalnaker uses the concept of common ground to model communicative practices in collaborative inquiry. More specifically, Stalnaker's framework models how people's assertions contribute to a growth of shared information. The common ground framework is thus a type of dynamic semantic framework. The basic idea of dynamic approaches is that the meaning of a statement is its 'context change potential', i.e., how it updates an information state called the conversational 'context'. Traditionally, there has been a debate in dynamic semantics over what this conversational context exactly

²See van Ditmarsch et al. (2009) for an overview of the history of concepts such as 'common knowledge' and 'common belief' and various definitions that have been offered.

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is. On a ‘psychologistic’ interpretation of the context (e.g., Geurts (1999); Kamp (2015); Maier (2017)) it is an agent’s mental state. Speech acts are thus defined in terms of how they update a specific agent’s propositional attitudes. On a ‘common ground’ interpretation of the context such as Stalnaker’s (see also e.g., Heim (1982); Groenendijk and Stokhof (1991); van der Sandt (1992).) it is a representation of the common ground between speaker and hearer. Speech acts are thus defined in terms of how they update the (interlocutor neutral) common ground (but see Hamm et al. (2006) for a conciliatory view).

In Stalnaker’s framework, the common ground of a certain conversation is the set of presuppositions mutually shared by the conversational participants. This notion has a dual function: First, assertions are analysed as proposals to update the common ground. Second, the notion of common ground is used to explain how a shared background can guide the production and interpretation of speech acts. For instance, suppose Mary makes the following assertion about an upcoming party:

(10) Nobody is coming to the party.

Firstly, through this assertion Mary proposes that it becomes common ground between her and her hearer (let’s call him John) that nobody is coming to the party. In other words, she proposes to further limit the ‘context set’ (i.e., the set of possible worlds compatible with the common presuppositions) by removing possible worlds in which someone *does* come to the party. Secondly, Mary can felicitously say (10) (and her assertion can be properly understood by John) precisely *because* it was already common ground between Mary and John that there is a party before Mary’s assertion. If it hadn’t been, Mary’s assertion would not have been pragmatically well-formed.

2.2.2 Traditional definitions of common ground

According to Stalnaker (2002), a *prima facie* intuitive and simple approximation of the concept of common ground is to define it as common belief. I dub this the ‘belief-based’ conception of common ground. Stalnaker defines common belief as follows:

[A] proposition ϕ is common belief of a group of believers if and only if all in the group believe that ϕ , all believe that all believe it,

all believe that all believe that all believe it, etc. (Stalnaker, 2002, p.704)

This formulation is often copied by semanticists that work with Stalnaker’s pragmatic framework (e.g., Stokke (2013); Zucchi (forthcoming)). However, strictly speaking the formulation is ambiguous between a de re and a de dicto reading: Do all believers believe de re of all believers that they believe that ϕ , or do all believers believe de dicto that “all believers believe that ϕ ”?³

The difference in interpretation comes out when we formalise the notion of common ground. Standard textbook analyses of notions such as common belief and common knowledge are in terms of iterative de re attitudes that people have towards each other. For instance, proposition 2.5 in the *Stanford Encyclopedia of Philosophy* article on common knowledge (Vanderschraaf and Sillari (2014)) defines common knowledge in terms of a ‘hierarchy’ of statements of the form ‘ a knows that b knows that c knows that ... ϕ ’ (see also e.g., Geurts (2020); Schiffer (1972, p.30)). Common ground (on a belief-based conception) can thus be formalised as follows: p is common ground between everyone in some community of conversational participants iff (where Cx means x is a conversational participant and $\mathbf{B}_x\phi$ means x believes that ϕ):

$$\begin{aligned} & \forall x(Cx \rightarrow \mathbf{B}_x p) \\ & \forall x \forall y((Cx \wedge Cy) \rightarrow \mathbf{B}_x \mathbf{B}_y p) \\ & \forall x \forall y \forall z((Cx \wedge Cy \wedge Cz) \rightarrow \mathbf{B}_x \mathbf{B}_y \mathbf{B}_z p) \\ & \vdots \end{aligned}$$

In words, everyone in the community believes that p ; everyone in the community believes of all members of the community that they believe that p ; everyone in the community believes of all members of the community that they believe of all members of the community that they believe that p ; etc. From this we can derive a hierarchy of iterative de re attitudes. For instance, if a , b , and c are the conversational participants of some community (i.e., Ca , Cb and Cc), p is common ground in the community iff a , b and c all believe that p ; a believes that b believes that p ; a believes that c believes that p ; etc.⁴

³Arguably, there is even a third interpretation possible where all believers believe de re of the group of believers that it collectively believes that ϕ . I leave exploration of this option to further research.

⁴Here and in the rest of this chapter I am assuming the principle of positive introspection (see Rendsvig and Symons (2019) for an overview of different epistemic logics and their

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In a similar vein, we can talk about common ground between speaker and hearer of a particular speech act in terms of iterative de re beliefs: p is common ground between speaker a and hearer b iff:

$$\begin{array}{cc} \mathbf{B}_a p & \mathbf{B}_b p \\ \mathbf{B}_b \mathbf{B}_a p & \mathbf{B}_a \mathbf{B}_b p \\ \mathbf{B}_a \mathbf{B}_b \mathbf{B}_a p & \mathbf{B}_b \mathbf{B}_a \mathbf{B}_b p \\ \vdots & \vdots \end{array}$$

In words, a and b both believe that p ; b believes that a believes that p ; a believes that b believes that p ; etc.⁵ So when Mary says (10) to John she proposes that it becomes the case that she believes that nobody is coming to the party; that John believes this; that she believes that John believes this; that John believes that she believes this; etc. Similarly, Mary's assertion (10) is felicitous because Mary believes that there is a party; John believes this; Mary believes that John believes this; John believes that Mary believes this; etc.

Alternatively, common ground can be defined in terms of common acceptance. This is the notion of common ground that Stalnaker (2002) eventually adopts (see also e.g., Stokke (2013, 2018)): p is common ground between a and b iff (where $\mathbf{A}_x p$ means x accepts that p):

$$\begin{array}{cc} \mathbf{A}_a p & \mathbf{A}_b p \\ \mathbf{B}_b \mathbf{A}_a p & \mathbf{B}_a \mathbf{A}_b p \\ \mathbf{B}_a \mathbf{B}_b \mathbf{A}_a p & \mathbf{B}_b \mathbf{B}_a \mathbf{A}_b p \\ \vdots & \vdots \end{array}$$

principles): If a believes that p , then a also believes that a believes that p , etc. In other words, our attitudes are transparent to ourselves.

⁵Some theorists prefer to give a precise finite definition of these seemingly infinite concepts such as common belief and common knowledge. One way of doing this is by means of a recursive definition. For example, let q represent the fact that some proposition p is common belief between a and b . q is true iff a and b believe both p and q . See e.g., Barwise (1988) for a comparison of such definitions and the iterative definition. Another way of doing this is to model knowledge and belief in Kripke models (i.e., in terms of accessibility relations between possible worlds) and define common knowledge through the transitive closure of the union of all individual agents' accessibility relations (see Fagin et al. (1995)). Roughly put, p is common knowledge between a and b iff p is true in all possible worlds that are accessible through some chain of a 's and b 's accessibility relations. I will ignore these issues and use infinite definitions in the following since these clearly capture the intuitive notion of what is necessary for something to be common ground.

2.3 Real-life communication

In words, a and b both accept that p ; a believes that b accepts that p ; b believes that a accepts that p ; etc. [Stalnaker \(2002\)](#) defines ‘acceptance’ as a propositional attitude that is similar to belief but doxastically neutral. I can for instance accept that Santa lives on the North Pole for the sake of conversation while I do not believe this. I dub this the ‘acceptance-based’ conception of common ground.

More recently, common ground has been defined as common commitment (e.g., [Geurts \(1997\)](#)): p is common ground between a and b iff (where $C_{x,y}\phi$ means x is committed to y to act on ϕ being true):

$$\begin{array}{cc} C_{a,b}p & C_{b,a}p \\ C_{b,a}C_{a,b}p & C_{a,b}C_{b,a}p \\ C_{a,b}C_{b,a}C_{a,b}p & C_{b,a}C_{a,b}C_{b,a}p \\ \vdots & \vdots \end{array}$$

In words, a is committed to b to act on p being true; b is committed to a to act on p being true; b is committed to a to act on it being true that a is committed to b to act on p being true; a is committed to b to act on it being true that b is committed to a to act on p being true; etc.

2.3 Real-life communication

The above definitions of common ground abstract away from actual language use in several ways. This has spurred a general movement in philosophy and semantics of challenging and redefining traditional notions of common ground so as to make them applicable to real-life communication. In this section I first briefly discuss three challenges that have previously been posed to traditional definitions of common ground (and related notions such as common knowledge). These challenges are relevant to the current undertaking of applying the notion of common ground to our stereotypical engagement with fiction, e.g., reading a fictional novel. Second, I introduce a novel challenge – that is also relevant to this end – concerning the application of traditional common ground definitions to communication where conversational participants are not acquainted.

2.3.1 Steps towards a functional notion of common ground

No infinite iteration of attitudes

A central and widely discussed problem with the belief-based and acceptance-based definitions of common ground (and related notions such as common knowledge) is that they involve infinite iterations of propositional attitudes. Obviously, actual people don't form infinitely many beliefs about each other's mental state. They will usually not get beyond third or fourth order beliefs. So, given that the iteration will always be broken off at some point in real life, there can never actually exist any common ground between conversational participants. To avoid this issue we may choose to talk about 'partial common belief' or p being 'first-order belief', 'second-order belief', etc. depending on how many iterations of beliefs the conversational participants have formed.

In this dissertation I follow Lewis' suggestion that the infinite structure in common ground definitions represent "a chain of implications [that follow from our beliefs], not of steps in anyone's actual reasoning. Therefore there is nothing improper about its infinite length" (Lewis, 1969, p.53). For instance, the infinite iteration of beliefs in the belief-based definition of common ground represents the 'implicit' beliefs of the conversational participants (i.e., what they would believe if they were perfectly rational and had unlimited cognitive capacities) rather than their actual 'explicit' beliefs (see also Heal (1978); Clark and Marshall (1981); Barwise (1988)). Geurts' (2020) commitment-based definition of common ground adopts a similar 'normative' approach; commitments express norms for behaviour, not actual cognitive attitudes, and hence can iterate infinitely.

Graded beliefs

Another issue with traditional common ground definitions (that are formulated in terms of attitudes) is that they presuppose full-blown belief or acceptance. However, sometimes people can be more or less certain of their beliefs. People can have a less than full-blown first-order belief (e.g., I may believe that I locked the door but am not one hundred percent sure about this). Moreover, people can be more or less sure about higher-order beliefs. This can for instance occur when conversational participants are dealing with unreliable communication channels and are not sure whether a certain communicative act has been transmitted and hence whether their

interlocutor has updated their beliefs (see ‘the coordinated attack problem’, e.g., [Akkoyunlu et al. \(1975\)](#); [Gray \(1978\)](#); [Cohen and Yemini \(1979\)](#); [Fagin et al. \(1995\)](#)). Hence, in such situations there cannot exist common ground. A possible weakening of notions of common ground in terms of full-blown belief (or acceptance) is to talk about graded beliefs and hence graded common ground. For instance, we can use the notion of common p -belief where x p -believes some proposition ϕ iff x believes ϕ with at least a probability of p (see e.g., [Brandenburger and Dekel \(1987\)](#); [Stinchcombe \(1988\)](#); [Monderer and Samet \(1989\)](#)) In this dissertation I mostly abstract away from this issue; in most of the following discussion I assume full-blown belief in and acceptance of propositions and hence full-blown common ground. An exception to this is the discussion in chapter 8 where confidence in some information being common ground is expressed in terms of an entrenchment ordering on propositions.

No simultaneous attitudes or commitments

A less well-known issue with traditional definitions of common ground and related concepts such as common knowledge is that they require *simultaneous* attitudes or commitments. This has spurred a debate in logic of distributive systems on how to obtain common knowledge in systems where messages may be delayed (see e.g., [Halpern and Moses \(1990\)](#); [Fagin et al. \(1999\)](#); [Panangaden and Taylor \(1998\)](#)). However, the requirement of simultaneous attitudes or commitments has received very little attention in semantics. This is somewhat surprising because the requirement makes traditional common ground definitions inapplicable to many forms of real-life communication.

Reconsider the belief-based conception of common ground between speaker a and hearer b . According to this definition, for some proposition p to be common ground the speaker has to believe p (i.e., $\mathbf{B}_a p$). However, this can’t simply mean that a believes p at some point in time. This would entail that we can merely establish that p is common ground simpliciter; depending on whether there exist points in time (past, present or future) at which a and b have the required attitudes, p is common ground or not. However, we want to use the concept of common ground as a dynamic notion, i.e., what is common ground can change over time. Hence we somehow want to be able to talk about p being common ground at a certain time t_1 because conversational participants have the relevant attitudes towards p at t_1 (and

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not being common ground at some other time t_2 because conversational participants lack the relevant attitudes at t_2).

Prima facie, to arrive at such a notion we can – on a belief-based definition of common ground – assume the following time indexing: p is common ground at t_1 between speaker a and hearer b iff (where $\mathbf{B}_x^t\phi$ means x believes that ϕ at time t):

$$\begin{array}{cc} \mathbf{B}_a^{t_1} p & \mathbf{B}_b^{t_1} p \\ \mathbf{B}_b^{t_1} \mathbf{B}_a^{t_1} p & \mathbf{B}_a^{t_1} \mathbf{B}_b^{t_1} p \\ \mathbf{B}_a^{t_1} \mathbf{B}_b^{t_1} \mathbf{B}_a^{t_1} p & \mathbf{B}_b^{t_1} \mathbf{B}_a^{t_1} \mathbf{B}_b^{t_1} p \\ \vdots & \vdots \end{array}$$

In words, a and b both believe at t_1 that p ; a believes at t_1 that b believes at t_1 that p ; etc. When either a or b stops having one of the relevant iterated beliefs at a later time t_2 (e.g., the speaker no longer believes that the hearer believes that p , i.e., $\neg\mathbf{B}_a^{t_2}\mathbf{B}_b^{t_2}p$), it is no longer common ground that p at t_2 .

The above time indexed definition of common ground does not apply to all forms of real-life communication. Discourse can stretch out over time so that the speaker's act of producing a particular utterance may be hours, days or years before the hearer's interpretation of the utterance (e.g., in the case of answering machine messages, books, blogposts, letters, etc.). Hence it is possible that the times at which the speaker has propositional attitudes relevant to establishing common ground only partly overlap, or do not overlap at all, with the times at which the hearer has the relevant propositional attitudes. Consider, for instance, my reading of Wittgenstein's *Tractatus*. Since Wittgenstein died long before I was born, whatever he believed, accepted or was committed to act on being true, he did so before I ever believed or accepted anything or was committed to act on anything being true. Hence we never had any attitudes or commitments simultaneously (let alone simultaneous beliefs about what the other currently believes), and thus – on the above common ground definition – there never was any common ground between Wittgenstein and myself.⁶

⁶Similar problems concerning delays in communication can pop up in less extreme scenarios. For instance, [Halpern and Moses \(1990\)](#) show that (even if the hearer engages with the speech act while the speaker still has the appropriate attitudes), if there is no fixed time for a message to arrive, there cannot arise common knowledge (e.g., there is no point at which the speaker can be sure that the hearer has received the message and has updated her attitudes. They can be sure if and when they receive a confirmation

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A possible strategy is to bite the bullet and maintain that, indeed, there can never exist common ground between a speaker and a hearer if they have no simultaneous attitudes or commitments. However, although it may seem acceptable to maintain that there is no common ground between Wittgenstein and myself (e.g., because I'm not a 'proper' hearer of Wittgenstein's assertions), the same problem of non-simultaneous attitudes can occur on a much shorter time span involving clearly proper hearers. Suppose that a father on his deathbed writes "The Irish crown jewels are hidden in Nouvion" in a letter to his favourite daughter that she is meant to read when he is dead. Intuitively, the statement in the letter is an assertion made by the father with his daughter as proper hearer. However, on the above definition of common ground, it cannot be analysed as such since the speech act cannot have been a proposal to update simultaneous common beliefs between father and daughter with the information that the crown jewels are in Nouvion.⁷

More importantly, the above strict notion of common ground will not do for the purposes of this dissertation. I aim to model our stereotypical engagement with fiction (e.g., the communication between Tolkien and myself through *The Lord of the Rings*) in terms of common ground. We thus need a different, less stringent notion of common ground that can apply to discourse that stretches over time and involves non-simultaneous attitudes or commitments between hearers and (possibly deceased) speakers.⁸

Semanticists that want to apply the notion of common ground to discourse that involves non-simultaneous attitudes or commitments may opt to borrow notions from the logic of distributed asynchronous systems such as ϕ being 'epsilon common knowledge' (Halpern and Moses (1990)) (i.e., everyone will know within ϵ time units that ϕ , etc.), 'eventual common knowledge' (Halpern and Moses (1990); Fagin et al. (1999)) (i.e., everyone knows ϕ at some point in time, etc.) or 'concurrent common knowledge'

message but at this point the sender of that confirmation message cannot be sure that their message has already arrived, etc.).

⁷This scenario also shows that although the issue of non-simultaneous attitudes or commitments arises naturally in cases of deceased unacquainted authors, it is a separate issue from whether speaker and hearer are acquainted.

⁸Some people may be hesitant to apply the term 'common' ground in the above examples precisely because the attitudes are not simultaneous. Since my general aim is to give a uniform analysis of different types of communication in Stalnaker's *common ground* framework, I will stick to this term. An alternative strategy would be to rephrase Stalnaker's theory and define speech acts as proposals to update a '(shared) background', '(shared) ground' or 'context'.

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(Panangaden and Taylor (1998)) (i.e., attitude updates do not have to be simultaneous but are causally related in a consistent manner). I leave exploration of what notion of common knowledge would be most useful to future research.

For the purpose of this dissertation I tacitly assume the following simple definition of time indexed common ground that borrows elements from the concept of eventual common knowledge but defines common ground as existing between time slices of conversational participants. p is common ground between speaker a at t_1 and hearer b at t_2 iff:⁹

$$\frac{\mathbf{B}_a^{t_1} p \quad \mathbf{B}_b^{t_2} p}{\mathbf{B}_b^{t_2} \exists t (t \leq t_2 \wedge \mathbf{B}_a^t p) \quad \mathbf{B}_a^{t_1} \exists t (t \geq t_1 \wedge \mathbf{B}_b^t p)}$$

$$\mathbf{B}_a^{t_1} \exists t (t \geq t_1 \wedge \mathbf{B}_b^t \exists t' (t' \leq t \wedge \mathbf{B}_a^{t'} p)) \quad \mathbf{B}_b^{t_2} \exists t (t \leq t_2 \wedge \mathbf{B}_a^t \exists t' (t' \geq t \wedge \mathbf{B}_b^{t'} p))$$

$$\vdots \quad \vdots$$

Hence some proposition p is not defined as being common ground at a specific point in time or being common ground simpliciter, but rather being common ground between conversational participants at certain points in time. In the case of the father at his deathbed, the father believes some proposition p at t_1 ; the daughter believes p at t_2 ; the father believes at t_1 that his daughter will believe that p (at some later time); the daughter believes at t_2 that her father believed that p (at some earlier time); etc. This is enough to say that it is common ground that p between father at t_1 and daughter at t_2 .¹⁰ Setting aside issues concerning acquaintance for now, the communication between Wittgenstein (or Tolkien) and myself also falls under this definition; the author had the appropriate beliefs in his time, I have the appropriate beliefs in my time and hence there exists common ground between us.

⁹Because this is a definition of common ground between only one speaker and one hearer, it can display an asymmetry in attitudes that is not present in generalized common ground definitions (i.e., between time slices of more than two conversational participants). Assuming that the production of a speech act is always prior to its interpretation, the speaker believes that the hearer *has or will have* certain attitudes, whereas the hearer believes that the speaker *has or had* certain attitudes.

¹⁰If either conversational participant lacks the appropriate beliefs at some other time (e.g., the daughter no longer believes p at t_3 , i.e., $\neg \mathbf{B}_b^{t_3} p$) there exists no common ground between those time slices of the interlocutors (e.g., it is not common ground that p between father at t_1 and daughter at t_3).

2.3.2 Communication without acquaintance

In this subsection I introduce a novel challenge to traditional definitions of common ground concerning unacquainted conversational participants. As shown above, traditional textbook common ground definitions in terms of attitudes seem to involve beliefs about others, i.e., *de re* beliefs. In other words, they take face-to-face¹¹ conversations – where conversational participants are acquainted with each other – as a model for communication in general. However, people that are not acquainted can also communicate (e.g., Monk who communicates with his readers). We thus need to further adjust our definition of common ground. To clearly show the worry, I will in this section reformulate the belief-based definition of common ground under a relational analysis of *de re* attitudes that makes explicit the required acquaintance relations. In the rest of this chapter I will focus on belief-based common ground definitions but the discussed issues and solutions straightforwardly extend to common ground definitions in terms of other cognitive attitudes such as acceptance. It is an open question whether they also extend to a commitment-based conception of common ground.¹²

Relational analysis of *de re* belief

In the relational analysis of *de re* belief (Kaplan (1968); Lewis (1979). See also Cresswell and Von Stechow (1982)) if *a* believes *de re* of *b* that he is *Q*, this means that there is an acquaintance relation between *a* and *b*, and that *a* believes that the person he knows through this acquaintance relation is *Q*. *De re* beliefs are thus in essence *de dicto* beliefs paired with an acquaintance relation that links the believer to the res. Such an analysis allows us to account for so-called Ortcutt scenarios (see Quine (1956)): Suppose you and your favourite nephew Nick are driving to your uncle's birthday party in separate cars. Nick cuts you off on the highway but, although you see a glimpse of the driver, you do not realize that it is Nick nor recognize Nick's car. You become angry at the driver and form the *de re* belief about Nick that

¹¹Here 'face-to-face' conversations do not require conversational participants to actually be in front of each other. It is sufficient if they know who they are currently talking to (e.g., an online chat conversation with a friend is also a 'face-to-face' conversation).

¹²The main question here is whether we can make a distinction between *de re* and *de dicto* commitments; intuitively, '*a* being committed to *b* to act on it being true that *b* is committed to *a* to act on *p* being true' is different from '*a* being committed to *b* to act on it being true that *the hearer* is committed to *a* to act on *p* being true'.

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he is a complete ass but lose sight of the car quickly. When entering your uncle's house, however, you are greeted by Nick's enthusiastic embrace and are reinforced in your de re belief about Nick that he is a great guy. Does this mean that you have logically inconsistent de re beliefs, i.e., that Nick is a complete ass and a great guy? The relational analysis of de re beliefs can explain why not: You are acquainted with Nick through the car incident and you believe that the person you saw on the highway is a complete ass. You are simultaneously also acquainted with Nick through regular family gatherings and believe that the person you are acquainted with through family gatherings is a great guy. Hence your de re beliefs – which are comprised of perfectly coherent de dicto beliefs – are not inconsistent.

The relational analysis implies that if a has a de re belief about b , then a has a de se belief (e.g., a has a belief about “the person that I saw on the highway”). I follow Lewis (1979) in analysing all attitudes (including de re attitudes) as essentially de se attitudes, i.e., as self-ascription of a property. So if a believes de re of b that he is Q , then a is acquainted with b , and a self-ascribes the property of being such that “the person that I am acquainted with is Q ”. This is represented as follows:

$$\exists R_1[R_1(a, b) \wedge \mathbf{B}_a^* \lambda i [Q(\iota v [R_1(i, v)])]]$$

In the above formula $\exists R_n[R_n(x, y)]$ means that there is an acquaintance relation R_n such that x is acquainted with y through R_n . $\mathbf{B}_x^* P$ means that x self-ascribes the property P . The term $\lambda x[\phi]$ denotes the property of being an x such that ϕ . I use the letters i, i', i'' etc to denote the de se center, i.e., the self. In the rest of this chapter I will abbreviate $\iota v [R_1(i, v)]$ (i.e., “the person that I am acquainted with through relation R_1 ”) as ιR_1^i .

Here and henceforth I assume that identity is always a salient acquaintance relation; everyone is always acquainted with themselves *as themselves* (de se). In the cases I discuss, identity is the only relevant acquaintance relation we have to ourselves.

Iterative de re beliefs

Iterative de re beliefs further complicate this picture. I adopt Maier's (2009a) analysis of iterative de re attitudes where if a believes de re of b that b believes de re of c that she is Q (i.e., in the earlier notation $\mathbf{B}_a \mathbf{B}_b Qc$), then this entails that a is acquainted with both b and c and that a self-ascribes the property of being such that b is acquainted with c and that the former self-

ascribes the property of being such that “the person that I am acquainted with is Q ”:

$$\exists R_1[R_1(a, b) \wedge \exists R_2[R_2(a, c) \wedge \mathbf{B}_a^* \lambda i[\exists R_3[R_3(1R_1^i, 1R_2^i) \wedge \mathbf{B}_{1R_1^i}^* \lambda i'[Q(1R_3^i)]]]]]]$$

So, if Ann believes de re of Bob that he believes de re of Chrissy that she is cool then [1] Ann is acquainted with both Bob and Chrissy through respectively acquaintance relations R_1 and R_2 , [2] Ann believes that the person she is acquainted with through R_1 is acquainted with the person she is acquainted with through R_2 and [3] Ann believes that the person she is acquainted with through R_1 believes that the person he is acquainted with is cool.

We can thus rewrite the common ground definition in terms of de re beliefs as follows (making the required acquaintance relations explicit): p is common ground between speaker a and hearer b iff:¹³

$$\frac{\mathbf{B}_a^* \lambda i[p] \quad \mathbf{B}_b^* \lambda i[p]}{\exists R_1[R_1(b, a) \wedge \mathbf{B}_b^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]]]} \quad \frac{\mathbf{B}_a^* \lambda i[p] \quad \mathbf{B}_b^* \lambda i[p]}{\exists R_1[R_1(a, b) \wedge \mathbf{B}_a^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]]]}}$$

$$\frac{\exists R_1[R_1(a, b) \wedge \mathbf{B}_a^* \lambda i[\exists R_2[R_2(1R_1^i, i) \wedge \mathbf{B}_{1R_1^i}^* \lambda i'[\mathbf{B}_{R_2^i}^* \lambda i''[p]]]]]} \quad \exists R_1[R_1(b, a) \wedge \mathbf{B}_b^* \lambda i[\exists R_2[R_2(1R_1^i, i) \wedge \mathbf{B}_{1R_1^i}^* \lambda i'[\mathbf{B}_{1R_2^i}^* \lambda i''[p]]]]]}{\vdots \quad \vdots}$$

So, both speaker and hearer self-ascribe the property of being such that p ; both are acquainted with the other and self-ascribe the property of being such that the person they are acquainted with self-ascribes the property of being such that p , etc.

Non-face-to-face conversations

The above reformulation of the traditional definition makes explicit why de re common ground definitions do not apply to non-face-to-face communication. I suggest that we can distinguish (at least) three distinct types of non-face-to-face communication that we do intuitively describe in common ground terminology but that traditional definitions do not apply to. I will

¹³Arguably, there is an additional implicit assumption that interlocutors have their iterative de re beliefs through the same constant acquaintance relation.

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dub these ‘messages in bottles’, ‘anonymous fan letters’ and ‘double-blind reviews’:¹⁴

- **Message in a bottle:** conversations where the identity of the speaker is known but that of the hearer isn’t and hence (although the hearer has *de re* beliefs about the speaker) the speaker does not have *de re* beliefs about the hearer. For instance, suppose you receive and read a message in a bottle from a famous person like Sting. Intuitively, it is common ground between Sting and you that there are monkeys on his desert island. However, here the speaker a is not acquainted with the hearer b (i.e., $\neg\exists R_1[R_1(a, b)]$). Conversations through books, blog posts, broadcasted speeches etc. are cases of such conversations with several hearers.
- **Anonymous fan letter:** conversations where the identity of the hearer is known but that of the speaker isn’t and hence (although the speaker has *de re* beliefs about the hearer) the speaker does not have *de re* beliefs about the hearer. For instance, intuitively, it is common ground between Sting and the writer of an anonymous fan letter that his voice is like the morning sun. However, here the hearer is not acquainted with the speaker (i.e., $\neg\exists R_1[R_1(b, a)]$).
- **Double-blind review:** conversations where the identity of neither conversational participant is known and neither conversational participant has *de re* beliefs about the other. For instance, intuitively, it is common ground between reviewer and author in a double-blind peer review process that the submitted paper should not exceed 20 pages. However, in these cases neither speaker nor hearer is acquainted with the other (i.e., $\neg\exists R_1[R_1(a, b)] \wedge \neg\exists R_2[R_2(b, a)]$).

¹⁴Actually, these distinctions raise questions about what constitutes an acquaintance relation. Intuitively, I am acquainted with Monk, but Sting is not acquainted with the writer of the anonymous fan letter because – even though I’ve never met him – I know Monk through his book, reading about him on Wikipedia, someone referring to him etc. and this is not true for Sting and the anonymous admirer. However, is Sting not in essentially the same way (though maybe in an impoverished sense) also acquainted with the anonymous admirer (or the reviewee with the anonymous reviewer) *through* the love-letter (or the review) (see e.g., [Jeshion \(2010\)](#); [Recanati \(2009\)](#))? Maybe anonymous fan letter conversations or double-blind review conversations (i.e., conversations where (at least) the hearer is not acquainted with the speaker) are in fact not possible. However, such a concession would not dissolve the problem with *de re* common ground definitions; discourse where the hearer is unknown still seems possible.

In the above types of communication either the speaker is not acquainted with the hearer, the hearer is not acquainted with the speaker, or neither is acquainted with the other. Hence the above iteration of de re beliefs cannot materialize in these cases and so there can exist no common ground between speaker and hearer (i.e., between Sting and the person that finds his message, between Sting and his secret admirer or between anonymous author and reviewer). This is unsatisfactory since these conversations *do* seem to involve producing and interpreting the relevant texts against a shared background. For instance, it is felicitous for the anonymous reviewer to write “Maybe this point relates to Grice’s third maxim” but not to write “Maybe this point relates to Bridget’s paper” because it *is* common ground what Grice’s third maxim is, but *not* who Bridget is.

The same problem arises in a generalized definition of common ground in terms of de re beliefs. If we make all acquaintance relations explicit, such definitions would be rewritten as follows: p is common ground between all conversational participants in some community iff:

$$\frac{\forall x(Cx \rightarrow \mathbf{B}_x^* \lambda i[p])}{\frac{\forall x \forall y((Cx \wedge Cy) \rightarrow (\exists R_1[R_1(x, y) \wedge \mathbf{B}_x^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]])]))}{\forall x \forall y \forall z((Cx \wedge Cy \wedge Cz) \rightarrow (\exists R_1[R_1(x, y) \wedge \exists R_2[R_2(x, z) \wedge \mathbf{B}_x^* \lambda i[\exists R_3[R_3(1R_1^i, 1R_2^i) \wedge \mathbf{B}_{1R_1^i}^* \lambda i'[\mathbf{B}_{R_3^i}^* \lambda i''[p]]]]]]))}}{\vdots}}$$

In words, everyone in the community self-ascribes the property of being such that p ; everyone in the community is acquainted with everyone in the community and self-ascribes the property of being such that the person they are acquainted with self-ascribes the property of being such that p ; etc. Here in the cases of two-person conversations through messages in bottles, anonymous fan letters and double-blind reviews, at least one of the conversational participants (the speaker or the hearer) is not acquainted with at least one of the other conversational participants (i.e., $\exists x \exists y(Cx \wedge Cy \wedge \neg \exists R_1[R_1(x, y)])$) and hence there can be no common ground in the relevant community.

2.4 Redefining common ground

Now that I have spelled out the challenge posed by non-face-to-face conversations to traditional common ground definitions, I will propose two potential fixes to these definitions. The two fixes are inspired by the intuitive idea that, although Monk may not have *de re* beliefs about (all) his readers individually, he does have general beliefs about ‘his readers’ and what they believe. In this section I discuss two ways of fleshing out the notion of general belief (i.e., *in sensu composito* and *in sensu diviso*) and propose two definitions of common ground based on these.

2.4.1 Generality *in sensu composito* and *in sensu diviso*

The two notions of common ground that I will propose are inspired by Abelard’s distinction between two types of generality (as discussed by Lewis (1969)): *in sensu composito* or ‘collective’ (Section 2.4.2) and *in sensu diviso* or ‘distributive’ (Section 2.4.3).¹⁵ If I believe a general rule *in sensu composito* then I have a general *de dicto* belief. For instance, if *a* considers all flowers to be pretty *in sensu composito*, then she believes ‘that all flowers are pretty’ (i.e., $\mathbf{B}_a \forall x (Fx \rightarrow Px)$ where *Fx* and *Px* respectively mean *x* is a flower and *x* is pretty). This means that there may be flowers that *a* does not believe to be pretty (for instance because she fails to realize that they are flowers).

Conversely, if I believe a general rule *in sensu diviso* then I have a general disposition to form singular *de re* beliefs in every relevant situation. For instance, if *a* considers all flowers to be pretty *in sensu diviso*, then she believes of every flower, if she sees it, that it is pretty (i.e., $\forall x (Fx \rightarrow (Sax \rightarrow \mathbf{B}_a Px))$ where *Sxy* means *x* sees *y*)¹⁶. This means that *a* might not recognize every flower as a flower (might even lack the concept of ‘flower’ altogether) but still believes of every flower that she comes across that it is pretty.

¹⁵Bermúdez (2003) construes from Braithwaite’s (1932) account of generality the following intermediate concept of general belief: if *a* believes that flowers are pretty then *a* believes of every flower that she sees and considers to be a flower, that it is pretty (i.e., $\forall x ((Fx \wedge Sax \wedge \mathbf{B}_a Fx) \rightarrow \mathbf{B}_a Px)$). I leave exploration into the merits of extending this notion to a common ground definition for future research.

¹⁶Contrary to Bermúdez (2003) and Meggle (2003), I represent the fact that *a* has a disposition to form *de re* beliefs by a conditional: if *a* is in the relevant situation (e.g., sees a flower), then *a* forms the appropriate beliefs.

2.4.2 *In sensu composito* common ground

Definition

First, I will present the *in sensu composito* definition of common ground. An *in sensu composito* understanding of general thought by *a* about the mental states of conversational partners would be as follows: *a* believes (or self-ascribes the property of being such) that ‘all conversational partners in the community believe that *p*’ (i.e., in our earlier notation: $\mathbf{B}_a \forall x (Cx \rightarrow \mathbf{B}_x p)$, in the present notation: $\mathbf{B}_a^* \lambda i [\forall x (Cx \rightarrow \mathbf{B}_x^* \lambda i' [p])]$). This leads to the following definition of generalized common ground in terms of general de dicto belief: *p* is common ground between all conversational participants in some community iff:

$$\frac{\frac{\forall x (Cx \rightarrow \mathbf{B}_x^* \lambda i [p])}{\forall y (Cy \rightarrow \mathbf{B}_y^* \lambda i [\forall x (Cx \rightarrow \mathbf{B}_x^* \lambda i' [p])])}}{\forall z (Cz \rightarrow \mathbf{B}_z^* \lambda i [\forall y (Cy \rightarrow \mathbf{B}_y^* \lambda i' [\forall x (Cx \rightarrow \mathbf{B}_x^* \lambda i'' [p])])])}} \vdots$$

In words, everyone in the community believes that *p*; everyone in the community believes that everyone in the community believes that *p*; etc. Hence *p* can be common ground in a community even though nobody has any de re beliefs about anyone. All that is required is that people have appropriate beliefs about what ‘everyone in the community of conversational participants’ believes.

I speculate that most semanticists that talk about common ground in a large community of interlocutors (e.g., Monk and his readership) tacitly assume (a version of) the *in sensu composito* definition of common ground. In fact, [Schiffer \(1972\)](#), [Meggle \(2003\)](#) and [Maier and Semeijn \(forthcoming\)](#) provide notions of common belief and common ground in a community that are similar to the above *in sensu composito* definition of generalized common ground. However, I assume that problems concerning our inability to form iterative de re attitudes relate to the absence of the relevant acquaintance relations – not to the number of conversational participants per se. Hence, these problems can also occur in a two-person (non-face-to-face) discourse. In other words, the *in sensu composito* definition of common ground is just as relevant when we talk about common ground between one speaker and one hearer, i.e., in a community of two. An *in sensu composito* understanding of general thought about conversational participants would lead to the

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following definition of common ground between speaker and hearer in a two-person discourse in terms of de dicto beliefs about ‘the speaker’ and ‘the hearer’:¹⁷ p is common ground between speaker a and hearer b iff (where Sx means x is a speaker and Hx means x is a hearer):

$$\frac{\frac{\mathbf{B}_a^* \lambda i[p] \quad \mathbf{B}_b^* \lambda i[p]}{\mathbf{B}_b^* \lambda i[\mathbf{B}_{Ix[Sx]}^* \lambda i'[p]] \quad \mathbf{B}_a^* \lambda i[\mathbf{B}_{Ix[Hx]}^* \lambda i'[p]]}}{\mathbf{B}_a^* \lambda i[\mathbf{B}_{Ix[Hx]}^* \lambda i'[\mathbf{B}_{Ix[Sx]}^* \lambda i''[p]]] \quad \mathbf{B}_b^* \lambda i[\mathbf{B}_{Ix[Sx]}^* \lambda i'[\mathbf{B}_{Ix[Hx]}^* \lambda i''[p]]]}}$$

$$\vdots \quad \vdots$$

So, both speaker and hearer believe that p ; the hearer believes that ‘the speaker’ (whoever it is) believes that p ; the speaker believes that ‘the hearer’ (whoever it is) believes that p ; etc. Again, p can be common ground without hearer or speaker forming any de re beliefs. All that is required is that they have the appropriate beliefs about what ‘the speaker’ or ‘the hearer’ believes. So – applying the *in sensu composito* notion of common ground to the mini-discourse between Mary and John – when Mary asserts (10) that nobody is coming to the party, she proposes that it becomes the case that she believes that nobody is coming to the party; that John believes this; that she believes that ‘the hearer’ (whoever it is) believes this; that John believes that ‘the speaker’ (whoever it is) believes this; etc. Similarly, Mary’s speech act (10) is felicitous because Mary believes that there is a party; John believes this; Mary believes that ‘the hearer’ believes this; John believes that ‘the speaker’ believes this; etc.

Application to four types of conversation

The *in sensu composito* definition is supposed to be a general definition of common ground that, unlike traditional definitions, applies to all four types of communication distinguished in the previous section (i.e., face-to-face conversations, messages in bottles, anonymous fan letters and double-blind reviews). For reasons of space I only show how this works for the

¹⁷We can derive these iterations from the general common ground definition because, in case speaker a and hearer b are aware that they are in a two-person discourse, a and b are both conversational participants (i.e., Ca and Cb), a believes that ‘the hearer’ is a conversational participant (i.e., $\mathbf{B}_a^* \lambda i[Cix[Hx]]$), b believes that ‘the speaker’ is a conversational participant (i.e., $\mathbf{B}_b^* \lambda i[Cix[Sx]]$), etc.

2.4 Redefining common ground

definition of common ground between one speaker and one hearer in a two-person discourse but the derivations for the generalized common ground definitions are similar.

Let's first consider conversations of type 'double-blind review' where neither speaker nor hearer is acquainted with the other. In such cases neither conversational participant has any de re beliefs about the other, nor do they believe the other to have these. I assume that the speaker does have iterative de dicto beliefs about the mental state of 'the hearer' (whoever that may be) and vice versa (e.g., the reviewer believes that 'the hearer' believes that p , the reviewee believes that 'the speaker' believes that p , etc). In other words, the mental states of the conversational participants are properly described by the iteration of de dicto beliefs of the *in sensu composito* definition on p. 30. Hence, on an *in sensu composito* understanding of common ground, it is common ground between speaker and hearer that p in this scenario and hence the definition shows how communication can take place.

Next, consider 'anonymous fan letter' conversations, i.e., conversations where the identity of the hearer is known but that of the speaker is not. I assume that also in these types of conversations, both interlocutors have iterative de dicto beliefs about the mental state of 'the hearer' and 'the speaker'. For instance, in the conversation between Sting and his anonymous admirer, Sting believes that 'the speaker' (whoever that may be) believes that Sting's voice is like the morning sun (p) and the admirer believes that 'the hearer' believes that p . Hence in this scenario it is also common ground that p on the *in sensu composito* definition. Apart from the relevant de dicto beliefs, one conversational participant (the speaker) also has de re beliefs about their interlocutor. I assume that in anonymous fan letter conversations, the identity of the hearer is 'known'. This means that both speaker a and hearer b believe de re of b that they are the hearer (i.e., $\mathbf{B}_b^* \lambda i [i = \iota x [Hx]] \wedge \exists R_1 [R_1(a, b) \wedge \mathbf{B}_a^* \lambda i [\iota R_1^i = \iota x [Hx]]]$), both believe that the other has this de re belief, etc. Hence although Sting only has de dicto beliefs about the mental state of 'the speaker', the admirer can form de re beliefs about Sting's mental state. Assuming we believe the logical consequences of our beliefs, we can for instance derive that since the admirer believes that 'the hearer' believes that p ($\mathbf{B}_a^* \lambda i [\mathbf{B}_{\iota x [Hx]}^* \lambda i' [p]]$) and the admirer believes de re of Sting that he is 'the hearer', that the admirer also believes de re of Sting (through the same acquaintance relation) that he believes that p : $\exists R_1 [R_1(a, b) \wedge \mathbf{B}_a^* \lambda i [\mathbf{B}_{\iota R_1^i}^* \lambda i' [p]]]$). Moreover, Sting and the

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admirer both have iterative de re or de dicto beliefs about the others' (de re or de dicto) beliefs about their interlocutor.

'Message in a bottle' conversations (i.e., conversations where the hearer is acquainted with the speaker but not vice versa) are the exact mirror image of anonymous fan letters and hence the same reasoning applies to those. In such cases the hearer has de re beliefs about the speaker but not vice versa.

Last, in face-to-face conversations, both conversational participants are acquainted with the other and have de re beliefs about their interlocutor's mental state. I assume that apart from these de re beliefs, interlocutors also have the appropriate iterative de dicto beliefs about the beliefs of 'the hearer' and 'the speaker'. Hence we can also say that p is *in sensu composito* common ground in these types of conversations.

2.4.3 *In sensu diviso* common ground

Definition

Next, I turn to the *in sensu diviso* version of a common ground definition. To formulate the *in sensu diviso* definition, we need to rewrite in conditional (or *in sensu diviso*) form the relational analysis of de re attitudes. In words, if a believes *in sensu diviso* of b that he is Q , then if there is an acquaintance relation from a to b , then a believes (or self-ascribes the property of being such) that the person he knows through this acquaintance relation is Q . This gets translated as $\forall R_1[R_1(a, b) \rightarrow \mathbf{B}_a^* \lambda i[Q \wedge R_1^i]]$.

An *in sensu diviso* understanding of a general thought by a about the mental states of conversational partners would be as follows: It is true of all conversational partners in some community that if a is in a relevant situation with the conversational participant, then a believes of this person that they believe that p (i.e., in our earlier notation: $\forall x(Cx \rightarrow (Rax \rightarrow \mathbf{B}_a \mathbf{B}_x p))$ where Rxy means x is in a relevant situation with y). For now, I will assume that 'the relevant situations' are situations where an acquaintance relation obtains¹⁸ so that it is true of all conversational partners in some community that if there is an acquaintance relation from a to the conversational participant, then a believes that the person she is acquainted with believes that p . This gets translated as $\forall x(Cx \rightarrow \forall R_1[R_1(a, x) \rightarrow \mathbf{B}_a^* \lambda i[\mathbf{B}_{R_1^i}^* \lambda i'[p]]])$. This leads

¹⁸We can put further constraints on the relevant types of acquaintance relations. See section 2.5.2.

2.4 Redefining common ground

to the following definition of generalized common ground in terms of conditional de re belief:¹⁹ p is common ground between all conversational participants in some community iff:

$$\frac{\forall x(Cx \rightarrow \mathbf{B}_x^* \lambda i[p])}{\frac{\forall x \forall y((Cx \wedge Cy) \rightarrow \forall R_1[R_1(x, y) \rightarrow \mathbf{B}_x^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]])]}{\forall x \forall y \forall z((Cx \wedge Cy \wedge Cz) \rightarrow \forall R_1, R_2[(R_1(x, y) \wedge R_2(x, z)) \rightarrow \mathbf{B}_x^* \lambda i[\forall R_3[R_3(1R_1^i, 1R_2^i) \rightarrow \mathbf{B}_{1R_1^i}^* \lambda i'[\mathbf{B}_{1R_3^i}^* \lambda i''[p]]]])]}]}{\vdots}$$

So, everyone in the community believes that p ; for everyone in the community it is true that for everyone in the community, if the one is acquainted with the other, then the one believes that the person they are acquainted with believes that p ; etc. So, again, no de re beliefs are required for p to be common ground in a community. Common ground can exist in a community where no two people are acquainted. It is merely required that people would form the appropriate de re beliefs about one another if they were acquainted (and would believe that the others would as well).

In sensu diviso common ground between speaker a and hearer b is defined as follows:²⁰ p is common ground between speaker a and hearer b iff:

$$\frac{\frac{\mathbf{B}_a^* \lambda i[p] \quad \mathbf{B}_b^* \lambda i[p]}{\forall R_1[R_1(b, a) \rightarrow \mathbf{B}_b^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]]]} \quad \forall R_1[R_1(a, b) \rightarrow \mathbf{B}_a^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]]]}{\frac{\forall R_1[R_1(a, b) \rightarrow \mathbf{B}_a^* \lambda i[\forall R_2[R_2(1R_1^i, i) \rightarrow \mathbf{B}_b^* \lambda i[\forall R_2[R_2(1R_1^i, i) \rightarrow \mathbf{B}_{1R_1^i}^* \lambda i'[\mathbf{B}_{1R_2^i}^* \lambda i''[p]]]]]]]}{\mathbf{B}_{1R_1^i}^* \lambda i'[\mathbf{B}_{1R_2^i}^* \lambda i''[p]]]}]} \quad \frac{\forall R_1[R_1(b, a) \rightarrow \mathbf{B}_b^* \lambda i[\forall R_2[R_2(1R_1^i, i) \rightarrow \mathbf{B}_a^* \lambda i[\forall R_2[R_2(1R_1^i, i) \rightarrow \mathbf{B}_{1R_1^i}^* \lambda i'[\mathbf{B}_{1R_2^i}^* \lambda i''[p]]]]]]]}{\mathbf{B}_{1R_1^i}^* \lambda i'[\mathbf{B}_{1R_2^i}^* \lambda i''[p]]]}]}{\vdots \quad \vdots}$$

So, both speaker and hearer believe that p ; if the hearer is acquainted with the speaker, then the hearer believes that the person they are acquainted

¹⁹Meggle (2003) provides an alternative '*in sensu diviso*' version of a generalized common ground definition that boils down to the traditional definition in terms of de re beliefs. This version does not seem to do justice to the fact that a general *in sensu diviso* belief involves a *disposition* to form de re beliefs. Moreover, it suffers from the problems described in section 2.3.2 and hence is, in the context of this discussion, not the most interesting version of an *in sensu diviso* definition.

²⁰We arrive at these iterations from the general common ground definition because a and b are conversational participants (i.e., Ca and Cb).

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with believes that p ; if the speaker is acquainted with the hearer, then the speaker believes that the person they are acquainted with believes that p ; etc. So p can be common ground between speaker and hearer even though neither has any de re beliefs about the other. All that is required is that they would form the right de re beliefs about each other if they were acquainted (and would believe the other would do so as well).

So when Mary asserts (10) that nobody is coming to the party, she proposes that it becomes the case that she believes that nobody is coming to the party; that John believes this; that, if she is acquainted with John, then she believes of John that he believes this; that, if John is acquainted with Mary, he believes of Mary that she believes this; etc. Similarly, Mary's speech act (10) is felicitous because Mary believes that there is a party; John believes this; if Mary is acquainted with John, then she believes that of John that he believes this; if John is acquainted with Mary, then he believes of Mary that she believes this; etc.

A potential worry with the above *in sensu diviso* definitions is that they universally quantify over acquaintance relations, making the formulas trivially true when there are no relevant acquaintance relations. On the standard material implication analysis of conditionals, quantification over an empty domain is trivially true (e.g., given that there are no unicorns, it is true of all things that if they are a unicorn, then they are pink, black, robots, etc.). For the generalized de re and *in sensu composito* definitions (which also involve quantification) this does not lead to serious difficulties (i.e., it implies that if there are no conversational participants (i.e., $\neg\exists xCx$), then everything is trivially common ground). However, consider the *in sensu diviso* definition for common ground between speaker a and hearer b . If a is not acquainted with b (i.e., $\neg\exists R_1[R_1(a, b)]$), then it is *trivially* true that for all acquaintance relations, if they are from a to b , then a believes de re of b that they believe that p (i.e., $\forall R_1[R_1(a, b) \rightarrow \mathbf{B}_a^* \lambda i [\mathbf{B}_{iR_1}^* \lambda i' [p]]]$). The definition thus implies that if a and b are not acquainted, everything is trivially common ground between them. This is problematic because the *in sensu diviso* definition is supposed to apply to cases of non-face-to-face conversations and tell us whether some proposition is common ground in those situations or not.

To overcome this issue with the *in sensu composito* common ground definitions, we need a non truth-functional account of conditionals: Given that the antecedent (p) is false, the conditional ($p \rightarrow q$) can still be true or false. For instance, we can take ' \rightarrow ' (at least when embedded under a quantification

over acquaintance relations) to denote an ‘indicative conditional’ and adopt the Stalnaker/Lewis (Stalnaker (1968); Lewis (1973)) possible world analysis: $p \rightarrow q$ is true iff in the closest (or most similar) possible worlds to the actual world where p is true, q is also true.²¹ If p is in fact true, the actual world is the closest possible p -world to the actual world (and hence q must be true in order for the conditional to be true). Given this analysis, even if a is not acquainted with b , then still $\forall R_1[R_1(b, a) \rightarrow \mathbf{B}_b^* \lambda i[\mathbf{B}_{iR_1}^* \lambda i'[p]]]$ may be true or false: True if the closest possible worlds where a is acquainted with b are such that a believes de re of b that they believe that p . False if this isn’t the case.

Application to four types of conversations

Again, I will show how the four distinguished types of face-to-face and non-face-to-face communication are supposed to fit into the *in sensu diviso* definition.

First, I will consider non-face-to-face conversations where neither speaker nor hearer is acquainted with the other as in double-blind peer reviewing. In such conversations, neither interlocutor has any de re beliefs about the other, nor believes the other to have these.²² However, I assume that the interlocutors do have a disposition to form the appropriate de re beliefs; if they had been acquainted, they would have formed the relevant iteration of de re beliefs about each other (e.g., reviewer a would have believed de re of the author b that they believe that the submitted paper should not exceed 20 pages (p): $\forall R_1[R_1(a, b) \rightarrow \mathbf{B}_a^* \lambda i[\mathbf{B}_{iR_1}^* \lambda i'[p]]]$).²³ In other words, the mental states and dispositions of interlocutors in conversations of this type satisfy the iteration of mental states and dispositions described in the

²¹See chapter 4 for Lewis’ application of this analysis of conditionals to counterfactuals and in particular the fiction operator ‘In f , ϕ ’.

²²They may, as described above, have de dicto beliefs about the mental state of ‘the speaker’ or ‘the hearer’.

²³Arguably this may not be true for *all* possible acquaintance relations. For instance, if a saw b on the beach but does not realize that that was the person they are reviewing, a probably will not believe de re of b that they believe that the submitted paper should not exceed 20 pages. This suggests that an *in sensu diviso* definition in fact requires further constraints so that it only quantifies over acquaintance relations ‘in the context of the conversation’. See section 2.5.2 for further discussion.

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in sensu diviso definition on page 33. Hence p is common ground in this type of conversation under the *in sensu diviso* definition.

Next, I will consider conversations of type ‘anonymous fan letter’ where the speaker is acquainted with the hearer and has de re beliefs about them but not vice versa. I assume that in such a situation, although the hearer does not have any de re beliefs about the speaker, they do have a disposition to form these, had they been acquainted. The speaker, on the other hand, has de re beliefs about the hearer and their mental state (e.g., the anonymous admirer a believes de re of Sting b that he believes that his voice is like the morning sun (p): $\exists R_1[R_1(a, b) \wedge \mathbf{B}_a^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]]]$) However, from the fact that there is such an acquaintance relation we cannot derive that a has the appropriate beliefs for *all* acquaintance relations. Hence, to make his definition work, the defender of the *in sensu diviso* definition will have to assume that in ‘anonymous fan letter’ conversations, there is not only this acquaintance relation from a to b , but a also still has a general disposition (that the existent acquaintance relation and accompanying beliefs are in line with) to form the appropriate beliefs if he were otherwise acquainted with b : $\forall R_1[R_1(a, b) \rightarrow \mathbf{B}_a^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]]]$.²⁴ Hence on the *in sensu diviso* definition p is common ground in conversations of this type.

‘Message in a bottle’ conversations are the exact mirror image of ‘anonymous fan letter’ conversations (where the hearer, rather than the speaker, has de re beliefs about their interlocutor) and work similarly.

Last, in face-to-face conversations, both interlocutors have iterated de re beliefs about each other. Again, we assume that in addition to having de re beliefs about their interlocutor, speaker and hearer also have a general disposition to form the appropriate de re beliefs if they were otherwise acquainted. Hence the *in sensu diviso* definition also applies to these kinds of conversations.

²⁴An alternative strategy for the defender of an *in sensu diviso* definition is to assume a weaker version of the definition which requires a to either be acquainted and have the appropriate beliefs, or have a disposition to have these beliefs if a were acquainted: $\exists R_1[R_1(a, b) \wedge \mathbf{B}_a^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]]] \vee \forall R_1[R_1(a, b) \rightarrow \mathbf{B}_a^* \lambda i[\mathbf{B}_{1R_1^i}^* \lambda i'[p]]]$.

2.5 Comparison

Now that I have presented two possible strategies to improve upon traditional definitions of common ground, we can try to decide between them. Most importantly, we can compare how well they fit our intuitive understanding of common ground. Lewis (1969) has argued that a general rule is convention only if people believe it *in sensu diviso*, i.e., only if people respond in accordance with the rule in all relevant instances (whether they are aware of this or not). Similarly, one could argue that q is only truly common ground when people form the appropriate de re beliefs about conversational participants whenever they are acquainted with them. However, it is not obvious that Lewis' reasoning extends to the concept of common ground. I will first discuss what implications the different definitions have for the notion of felicity. Then I will discuss the case of the shy acquaintance that may help us decide between the two definitions.

2.5.1 Felicity and counterfactual success

Remember that common ground is not just what we propose to update with assertions, but also determines what speech acts are felicitous or appropriate in a particular context. For instance, reconsider the mini-discourse between Mary and John. If it is common ground that there is a party (q), then Mary can felicitously assert (10), i.e., that nobody is coming to the party (p). Otherwise, her speech act would not be felicitous. The *in sensu diviso* definition is crucially different from traditional common ground definitions in terms of iterative de re beliefs and *in sensu composito* common ground definitions because it defines context (and hence felicity) in terms of *conditional* beliefs, rather than actual beliefs. Hence, whereas for the de re and *in sensu composito* definitions the felicity of a speech act p in a context c is dependent on whether p will lead to successful communication in c , for the *in sensu diviso* definition it is dependent on whether p leads to successful communication in the context of the face-to-face version of the relevant conversation c' , which may or may not be identical to c .

To illustrate, consider Mary and John's discourse under the traditional de re and *in sensu composito* definitions of common ground. Suppose that it is common ground that there is a party (q). On the de re common ground definition, if q is common ground, then Mary and John are in a face-to-face conversation and Mary believes de re of John that he believes that q . On the

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in sensu composito definition, if q is common ground, then Mary has (possibly in addition to de re beliefs about John) the de dicto belief that ‘the hearer’ believes that q in all four distinguished types of conversation. Hence, if Mary wants to engage in cooperative communication, she would in fact say that nobody is coming to the party (p) (which presupposes q) because she would expect her interlocutor to understand her utterance of p . Similarly, if q is common ground, John would be able to interpret Mary’s assertion in face-to-face conversations and (under the *in sensu composito* definition) in all distinguished types of non-face-to-face conversations (because he either believes de re of Mary that she believes q or because he believes that ‘the speaker’ believes that q). If q is not common ground, either Mary will not say p (e.g., because she doesn’t believe that her interlocutor believes that q) or John will not be able to interpret p (e.g., because he does not believe his interlocutor believes that q). Hence on both definitions, if the speech act p is predicted to be felicitous (because it is common ground that q), this implies that p will also *actually* lead to successful communication.

The *in sensu diviso* definition is crucially different because it provides a notion of felicity that is tied to *conditional* success. For instance, in a non-face-to-face conversation between Mary and John of type ‘double-blind review’ (where neither is acquainted with the other) it can, in theory, be common ground that there is a party (q) even though Mary believes that ‘the hearer’ does not believe that q , John believes that ‘the speaker’ does not believe that q , etc. Still it would be common ground that q as long as it is true that *if* Mary and John were acquainted, they would form the right de re beliefs about one another. Mary’s assertion that nobody is coming to the party (p) is thus predicted to be felicitous even though p would not actually lead to successful communication; Mary would not actually utter p if she were trying to engage in cooperative communication (because – although if she were acquainted with John, she would believe of him that he believes that q – she does not currently believe that ‘the hearer’ believes that q) and, even if Mary did utter p , John would not even be able to interpret p (because – even though if he were acquainted with Mary, he would believe of her that she believes that q – he does not currently believe that ‘the speaker’ believes that q).

In other words, it seems that the intuitive idea behind the *in sensu diviso* definition is to take face-to-face conversations as a model for communication and define felicity in terms of what speech acts would lead to successful communication in the face-to-face version of the relevant conversation. Hence

we end up with an essentially different notion of felicity on the *in sensu diviso* definition than on *de re* and *in sensu composito* definitions. Whether some speech act is felicitous in some context thus becomes a separate issue from whether the speech act will actually lead to successful communication in that context. Some people may find this an unintuitive divorce and hence may want to avoid such a notion of common ground. Assuming we want a definition of common ground that also applies to non-face-to-face conversations, they are thus pushed into the direction of the *in sensu composito* definition. This is the notion of common ground that I will assume in subsequent chapters. I will end this chapter with a discussion of a particular kind of conversation that can help us tease apart the two available notions of common ground for non-face-to-face conversations (*in sensu composito* and *in sensu diviso*) and hence help us decide which fits our intuitive understanding better.

2.5.2 The shy acquaintance

To clearly see the difference between the two notions of common ground (and hence the two notions of the felicity of speech acts), suppose Thea signed up for a program where participants send weekly ‘diary entries’ to an anonymous reader. Unbeknownst to Thea, she has been sending her diary entries to her favourite nephew Nick who signed up to the program to be an anonymous reader. Nick quickly found out that he is receiving his aunt’s diary entries but has so far been too shy to admit this to Thea. Suppose Thea is interested in architecture and her latest diary entry contained the information that *The Sims* was originally designed as an architecture simulator (q). According to the *in sensu diviso* definition of common ground, it is *not* common ground between Thea t and her nephew n that q – Thea is acquainted with the hearer but does not believe of him (under that acquaintance relation) that he believes that q (i.e., $\exists R_1[R_1(t, n) \wedge \neg \mathbf{B}_t^* \lambda i[\mathbf{B}_{iR_1}^* \lambda i'[q]]]$).

According to the *in sensu composito* definition, it *is* common ground between Thea and her nephew that q – Thea has the appropriate beliefs about what ‘the hearer’ believes (i.e., $\mathbf{B}_t^* \lambda i[\mathbf{B}_{ix[Hx]}^* \lambda i'[q]]$) and the hearer is her nephew Nick (even though Thea does not recognize him as such).

An anonymous Amsterdam Colloquium 2019 reviewer has judged a comparable case to form an argument in favour of the *in sensu diviso* definition: If Thea would meet her nephew at her husband’s birthday party, surely

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she would not be licensed to base the production of her speech acts on the assumption that q is shared background knowledge. For instance, it would not be correct for her to say (11):

(11) I gave my husband that architecture simulation game.

since she does not expect her nephew to understand what game she is talking about. Similarly, the linguistic behaviour of the nephew will be as if he has no idea what game Thea is talking about (since he does not want to expose himself as a reader).

I agree with the reviewer's judgement but argue that in the above example conversation it would also not be common ground that q on an *in sensu composito* understanding. This is because during the birthday conversation Thea does not believe that 'the hearer' (of that conversation)²⁵ believes that q . The difference between the *in sensu composito* and the *in sensu diviso* definition in fact only comes out in conversations where Thea believes that 'the hearer' (of that conversation) believes that q . So the relevant situation to consider is one where Thea is writing another diary entry; here Thea believes that 'the hearer' believes that q (because the previous entry contained this information) and she is acquainted with the hearer (i.e., her nephew) but does not believe of him that he believes that q . Although intuitions may vary concerning this and related cases, I take these considerations to form a *prima facie* argument for the *in sensu composito* definition of common ground, i.e., in this situation it *is* common ground between Thea and her nephew that q . For instance, it would be felicitous for Thea to write (11) in such a situation precisely because she expects 'the reader' to understand what she is talking about (and the reader has the appropriate beliefs about 'the writer' as well).

A possible response to the above argument in favour of the *in sensu composito* definition is to add further constraints on acquaintance relations in the *in sensu diviso* definition. Intuitively, the mere existence of an acquaintance relation is not enough to establish that conversational participants are in a 'relevant situation' for common ground. Reconsider a who believes flowers to be pretty *in sensu diviso*. For a to be in a relevant situation for establishing

²⁵This indexical element implicit in the *in sensu composito* definition also explains how for instance two people can have multiple common grounds, i.e., they may not realize that their interlocutor in one communicative exchange is the same as their interlocutor in some other communicative exchange. Common ground is thus in fact defined as something that exists not just between interlocutors but between interlocutors in a particular communicative exchange.

general *in sensu diviso* belief, it is not enough for *a* just to be acquainted with a flower. Arguably, if I hit *a* on the back of the head with a bouquet of flowers, she is acquainted with the flowers but not in a relevant situation because she does not see the relevant flowers. In other words, the fact that *a* does not consider those flowers to be pretty does not disprove her general *in sensu diviso* belief that flowers are pretty. Similar constraints could be put on the relevant acquaintance relations necessary for establishing *in sensu diviso* common ground. Although it is challenging to make such notions precise, we could develop a version of *in sensu diviso* common ground that requires that conversational participants are acquainted *in the context of the relevant conversation*. In other words, we don't just consider counterfactual situations where conversational participants are acquainted simpliciter but rather where the relevant conversation is face-to-face.²⁶ Such an account would arguably predict that Thea's speech act *is* felicitous because Thea is not acquainted with her nephew in the context of writing the diary entries and would believe de re of him that he believes that *q* if she were. I leave exploration of how to make the notion of 'being acquainted in the context of the relevant conversation' more precise and the differences between this adjusted *in sensu diviso* definition and the *in sensu composito* definition to future research.

2.6 Conclusions

The main contribution of this chapter is a proposal of two potential refinements of traditional definitions of common ground in terms of de re attitudes in order to make them applicable to non-face-to-face communication. These come forth from Abelard's distinction between generality *in sensu composito* (i.e., speaker and hearer have iterative de dicto beliefs about the mental states of 'the speaker' and 'the hearer') and *in sensu diviso* (i.e., speaker and hearer form iterative de re beliefs about the mental states of speaker and hearer if they are acquainted with them). I have shown that the *in sensu diviso* definition makes the felicity of speech acts depend on

²⁶Similarly, the four different types of discourse that have been distinguished in section 2.3.2 can be reformulated with these further constraints. For instance, a conversation is of the type 'double-blind review' iff conversational participants are not acquainted *in the context of the conversation*. Hence close colleagues may engage in such a non-face-to-face conversation even though they are otherwise acquainted.

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counterfactual successful communication, i.e., what speech acts would lead to successful communication in the face-to-face version of the relevant conversation. Therefore this definition is less suitable for my purposes. I will henceforth in this dissertation assume the *in sensu composito* definition of common ground. Lastly, I have argued that the case of the shy acquaintance forms a *prima facie* argument in favour of an *in sensu composito* definition.