

Part 2: Common Ground, Updates and Speech Acts

Semantic and pragmatic theories rest on very elaborate notions of common ground and sentence meanings as context change potential. Speech acts seem to cause updates of the common ground of a special kind. Assertions simply provide further information to update the common ground, whereas speech acts (\neq assertions) appear to cause an additional update to the end that something has just *happened*. In the present part, we pursue the aim to devise a theory of speech acts which ties the *thing happened* to the *content conveyed* in a meaningful manner.

We will mainly use the following sources:

Stalnaker, Robert. 2002. *Common Ground*. In: *Linguistics and Philosophy* 25: 701 – 721.

Truckenbrodt, Hubert. 2009. *Speech Acts as Agreement*. Ms., HU Berlin.

The vision:

Assume that a small group of persons C witnesses someone stating (1):

(1) *The Eiffel Tower is in Bonn.*

The content of this assertion, of course, is not true in the real world. An informed listener might hence reject the assertion and prevent a general update. Let us assume, however, that the people in C are uninformed in matters of geography and update their common ground accordingly. But no matter how firmly they believe that the Eiffel Tower is in Bonn, the sentence will stay false in our world w_o .

Assume, in contrast, what happens if a small group of people C witnesses A stating (2).

(2) *I declare myself leader of the group for today.*

Assume that all members of the group are actually present, and understood the utterance. Like in (1), they have the option to reject A's utterance. But if they do not reject, the declaration will succeed and an according update will happen: $p =$ 'A is leader of group C for day X'. The nature of this piece of information intuitively differs from the first example. For p to be true, it seems sufficient that every member of group C believes that p is true. Or, in other words: It is hard to imagine for an informal gathering of people C (i.e. without legal backbone) that the entire of C agrees that A should be leader of the day, and the proposition $p =$ 'A is the leader of the day' be false. In this respect, facts of social agreement differ from facts in the world. Our vision could be expressed by the slogan "if everyone believes that it is so, then it is so", as an axiom about

social facts.

This observation is not new. It is part of the writings of Searle (xx?), notably Searle (1995: *The construction of Social Reality*) and has recently been taken up in Truckenbrodt (2009) who refers to Jary (2007) and other predecessors. What is new in this presentation, though, is our attempt to spell out the nature of social facts in terms of context updates in dynamic semantics. Truckenbrodt (2009) goes a long way in this direction, but we feel that his proposal is problematic in several respects and will discuss points of difference in detail at suitable places.

Ideal and realistic scenarios:

In order to develop the above vision into a detailed analysis, we will sometimes make use of certain idealized scenarios.

a. The “thing” scenario

In medieval times, all legal matters were discussed in the *thing* where the ruler met with all influential members of the involved group to negotiate matters personally. Our label is used the idealized situation where all persons C who have to power to influence social agreements are present when the speech act is issued. The relevant group of persons is well-defined, and they are all present. No members of the group are absent and have delegated their voice to others or might object later. There are no legal documents which, unbeknownst to group C, already settle the case, no matter on what the persons present agree.

We are aware of the fact that many speech acts in reality do not fit this pure scenario. However, we also feel that some of the institutional agreements that might complicate the “thing” scenario have been established in order to extend the “thing” scenario and make it more practicable. For instance, laws about who is allowed to establish a social fact are made to regulate the question “who is part of the relevant group C”. Laws about delegation of voice are made to prevent unclear situations where not all members of C are present. Legal documents often serve to preserve the vote of single members of the relevant group C. We therefore hope that the range of the approach will not be severely limited if we take the “thing” scenario as our occasional starting point.

b. The “no afterthoughts” idealization

This idealization is concerned with potential divergencies between a person’s actual belief and the person’s officially acknowledged belief. In the ideal case, we’d expect that the interlocutors act and talk faithful to their beliefs. Hence, if a person A states “*I will clean the kitchen tonight*” we expect that A is sincere. Likewise, if a person B does not object to the promise, we expect that B takes the promise as binding, and will act accordingly (e.g. by yelling A down

if B finds the kitchen still in a mess at 11 pm.).

Yet, in real life we will often encounter situations that do not fit the “no afterthoughts” idealization. The gap between mutual joint beliefs and common (official) ground is addressed in Stalnaker (2007) in order to model presupposition accommodation. Our aims are somewhat different, but the anticipated divergence between what is truly jointly believed and what is officially jointly acknowledged will certainly play a role for social acts, too. For instance, MPs can officially vote for a certain candidate in an election even though they secretly think that the person is a complete failure. In many instances, social reality comes about by *officially acknowledged beliefs* rather than *secret true belief*.

We will develop our proposal by pursuing two alternating strategies: We will use the *no afterthoughts* scenario in order to gather intuitions about the informations exchanged in a conversation where a social act gets established. And we will investigate how these intuitions can be carried over from *true joint belief* to *officially acknowledged belief*. In order to lay the ground for this carry-over, we will start this part by recapitulating the main assumptions in Stalnaker (2002). In order to stay terminologically consistent with this paper, we will in the following use CB = *common belief* for joint true beliefs (i.e. what is shared in the *no afterthought* scenario). We will use CG = *common ground*, following Stalnaker, to refer to the officially mutually shared beliefs. If matters might be unclear, we will use the qualification “*official common ground*” to stress that we have left the *no afterthought* scenario.

2.1. Stalnaker 2002, and adoptions

We assume that the belief state of individuals c is modelled by a binary relation R_c which relates all worlds w to those worlds w' such that c 's beliefs in w allow him to assume that w' were the world he is actually living in.¹ For a given world w , the set $\{ w' \mid w R_c w' \}$ are the doxastic alternatives of c in w . *Belief* is modelled as follows.

$$B_{c,w}(\phi) \text{ iff } \forall w'(w R_c w' \rightarrow w' \in \phi)$$

Commonly, the accessibility relation is assumed to be Euclidean, transitive, and serial. These assumptions reflect philosophical insights about the nature of rational belief, and we will recapitulate them briefly.

$$\text{Transitivity: } \forall w \forall w' \forall w''(w R_c w' \wedge w' R_c w'' \rightarrow w R_c w'')$$

¹ I will NOT follow current practice to phrase all examples in female gender. To the biased mind, a scenario like “ c believes that she might be in world w ” primes associations about the general mindlessness of women that are as politically incorrect as male gender reference in order to talk about the neutral situation. In that sense, gendered language doesn't do any more good than conservative language use, and is more tedious to handle.

This yields the following:

$$B_{c,w}(\phi) \text{ entails } B_{c,w}(B_c(\phi))$$

Proof:

$$B_{c,w}(\phi) \text{ iff } \forall w'(w R_c w' \rightarrow w' \in \phi)$$

Let us derive $B_{c,w}(B_c(\phi))$. Due to definition:

$$B_{c,w}(B_c(\phi)) \text{ iff } \forall w'(w R_c w' \rightarrow \forall w''(w' R_c w'' \rightarrow w'' \in \phi))$$

But, due to transitivity, if $w R_c w'$ and $w' R_c w''$ then also $w R_c w''$. Therefore, the right hand condition holds true, and hence $B_{c,w}(B_c(\phi))$. The backwards direction doesn't follow directly. We could devise a binary relation where all worlds w that are at *most* one step away from w_o do not support some proposition p but all worlds that are further away (i.e. allow for at least one intermediate stop after w_o) are p - worlds. However, the above entailment turns into an equivalence if we moreover assume that R_c is euclidean.

$$\text{Euclidean: } \forall w \forall w' \forall w''(w R_c w' \wedge w R_c w'' \rightarrow w' R_c w'')$$

if we can see both w' and w'' from w , then w' and w'' can see each other, too²

If R is euclidean, then

$$B_{c,w}(B_c(\phi)) \text{ entails } B_{c,w}(\phi)$$

Due to definition, $B_{c,w}(B_c(\phi))$ iff $\forall w'(w R_c w' \rightarrow \forall w''(w' R_c w'' \rightarrow w'' \in \phi))$

If $B_{c,w}(B_c(\phi))$, we know that all worlds that are *two* steps R_c away from w are in ϕ . We can derive for w, w_1 and w_2 : If $w R_c w_1$ and $w_1 R_c w_2$ then $w R_c w_2$ (due to transitivity) and $w_2 R_c w_1$ (euclidean). Thus we know that $w R_c w_2 R_c w_1$ (written in a series) and hence, w_1 is also two steps away from w . By assumption, we know that all worlds that are two steps away from w are in ϕ . We have shown that in an Euclidean, transitive relation, any world is "two steps away" from any other. Therefore,

$$\forall w'(w R_c w' \rightarrow w' \in \phi)$$

and hence $B_{c,w}(\phi)$.

A final assumption usually made is that R_c is serial: $\forall w \exists w'(w R_c w')$. This avoids vacuous quantification over an empty doxastic

² The visibility holds in both directions, because logical conjunction is symmetric.

space (i.e. individuals are assumed to never reach a state of total puzzlement).

On basis of these standard assumptions, it also follows that any individual c knows his non-beliefs:

$$\neg B_{c,w}(\phi) \rightarrow B_{c,w}(\neg B_c(\phi))$$

(sans proof, see St2002)

The notion of common belief of a group C in w is supposed to capture the set of propositions that all members c in C believe, that all members believe that all members believe, that all members believe all members believe all members believe etc. Following Schiffer (19xx), Stalnaker defines the common belief of group C as follows:

Definition: $CB_{C,w}(\phi)$ iff $\forall w' (w R_C w' \rightarrow w' \in \phi)$ where R_C is the transitive closure over the union of all individual doxastic accessibility relations R_c for c in C .

In more tangible words, $w R_C w''$ iff there is a sequence $x_1 x_2 \dots x_n$ over C such that $w R_{x_1} w_1, w_1 R_{x_2} w_2, \dots w_{n-1} R_{x_n} w''$.

Lemma 1: For all w, C : $CB_{C,w}(\phi)$ iff $CB_{C,w}(CB_C(\phi))$

That is, mutually joint beliefs are as introspective as single beliefs, given that all R_c are transitive and euclidean. (sans proof, St2002). However, Stalnaker points out that there are cases where $\neg CB_{C,w}(\phi)$ but it is not so that $CB_{C,w}(\neg CB_C(\phi))$. Given that it might be useful to understand cases where beliefs are unawarably unshared, we'll walk through an example.

Assume that $\neg CG_{C,w}$ ('there is time pressure') holds true in a group of two persons $C = \{a, b\}$. Hence, there is some world w' such that $w R_C w'$ and $w' \notin$ 'there is time pressure'. Spelling this out, there is some sequence $abab\dots$ such that $w R_a w_1, w_1 R_b w_2, \dots w_{n-1} R_a w_n$ and w_n supports: 'there is no time pressure'.

For example, there might be w_1 where $w R_a w_1$ such that:

for all $w_1 R_b w'$: $w' \in$ 'there is time pressure'

('a believes b believes there's time pressure')

for all w'' : $w_1 R_b w_2$ and $w_2 R_a w''$: $w'' \in$ 'there is time pressure'

('a believes that b believes that a thinks there's time pressure')

and so all the way down for worlds that are reached by *ababa*-series from w_1 .

but $w_1 \notin$ ‘there is time pressure’
 (‘a does not believe that there’s time pressure’)

However, the other person b might believe both that ‘there is time pressure’ and ‘that a also believes that there is time pressure’. I.e. for all worlds w_3 that are R_b -related to w , w_3 supports $CG_{C,w}$ (‘there is time pressure’). In the individual belief case, an euclidean relation would make w_1 and w_3 mutually visible and therefore, b could not cherish his isolated belief about everyone believing that ‘there is time pressure’. However, R_C only contains the transitive closure over R_a, R_b not the euclidean closure. And justly so, because misunderstandings like

“ a believes p and believes that this is common belief, but b believes $\neg p$, and believes that this is common belief”

are common and compatible with a and b being rational agents.

Yet, agents are still rational when they are parts of groups:

$$B_{c,w} (CG_C (p)) \rightarrow B_{c,w}(p)$$

(add proof, notes, page 2)

By contraposition, we get

$$\neg B_{c,w}(p) \rightarrow \neg B_{c,w} (CG_C (p))$$

and due to negative introspection being true for individuals:

$$\neg B_{c,w}(p) \rightarrow B_{c,w} (\neg CG_C (p))$$

Hence, if an individual does not believe p , then the individual believes that it isn’t common belief that p . As a slogan, “if I don’t think that p , then the collective can’t think that p either.” We will come back to this slogan later when we discuss rational ways for agents to plan and act.

A further way to organize the space of common belief is offered by Stalnaker (2002) without proof:

$$\{ w' \mid w R_C w' \} = \cup_{c \in C} \{ w'' \mid \exists w_1 (w R_c w_1 \wedge w_1 R_C w') \}$$

“The set of possible worlds compatible with the actual common belief is the union of the sets compatible with what each $c \in C$ believes to be common belief.” (attr. to Schiffer?)

Lemma 2: For any $c \in C$: $B_{c,w} (B_c(p) \rightarrow p)$

Proof: Let w' be such that $w R_c w'$. If $w' \in p$, then $w' \in B_c(p) \rightarrow p$, due to the properties of material implication. If $w' \notin p$ we know that $w' \in \neg p$ and therefore $\neg B_{c,w}(p)$. By introspection, $B_{c,w}(\neg B_c(p))$ and therefore, $B_c(p) \rightarrow p$ holds true in all worlds that can be reached via R_c from w . Hence, $B_{c,w}(B_c(p) \rightarrow p)$.

As a slogan, *Lemma 2* states that every subject trusts: “Well, if I believe p then p is true”. We might call this the “confident believer principle”.

This lifts to common beliefs:

Lemma 3: For any C : $CB_{c,w}(CB_c(p) \rightarrow p)$

We will prove the intermediate step that for all c , $B_{c,w}(CB_c(p) \rightarrow p)$. We have to show that for all w' be such that $w R_c w'$, we find that $w' \in CB_c(p) \rightarrow p$. As before, we proceed by cases.

If $w' \in p$, then $w' \in CB_c(p) \rightarrow p$ by material implication.

If $w' \notin p$ we know that $w' \in \neg p$ and therefore $\neg B_{c,w}(p)$. Using the generalized consistency principle above, we can apply that $\neg B_{c,w}(p) \rightarrow B_{c,w}(\neg CG_c(p))$. Hence, $w' \in \neg CG_c(p)$. Therefore, by material implication, $w' \in CB_c(p) \rightarrow p$.

Therefore, all worlds accessible from w via R_c are in $CB_c(p) \rightarrow p$ and thus,

$B_{c,w}(CB_c(p) \rightarrow p)$.

We can now apply the above reconstruction of the set of common belief worlds.

$$(*) \quad \{ w' \mid w R_C w' \} = \cup_{c \in C} \{ w'' \mid \exists w_1 (w R_c w_1 \wedge w_1 R_C w'') \}$$

All R_C -accessible worlds w' are what some $c \in C$ believes to be common belief. All $c \in C$ believe that $(CB_c(p) \rightarrow p)$. As this holds for all c and for all w , it holds specifically for any w_1 that is accessible in the first step, and for any c and w' that are accessible from w_1 in the second step in the definition (*). Therefore, all w' that can be reached from w via R_C make $(CB_c(p) \rightarrow p)$ true, qed.

This is the point we had to reach about belief and mutual belief in general in order to turn to the vision about social agreement. Note that these two facts about “believed things are true things” come dangerously close to the property about social facts that we envisaged above. In the next part, we will try to offer a defining property for social facts that is different from the entailments above, but strong enough to spell out the characterizing property of social agreements p : “If everyone believes it, p must be true”.

Entering new grounds

We will start by an epistemic truth about social agreements. Assume that some proposition p is about a mutual agreement between members of a (relevant) group C . It was argued above that, due to the nature of social agreements, p can not be false if all members in C believe that p is true. Assume, for instance, that the group $C = \{a,b\}$ are two girls who just caught a frog. The question arises whether it is a or b who will be the owner of the frog. It seems unproblematic to assume that whatever a and b agree on will settle the issue of frog ownership. If both agree that the frog should be a 's then so it is. Similarly for b .

We want to leave it an option that sometimes a social fact could be settled even though some member of the relevant group does not yet know this. This is typically the case when legal acts of various parties can be necessary to settle an relation. If, for instance, a buys a car from some other person b , a and b may agree that the money transfer is handled by a and that b simultaneously arranges the legal paperwork that is involved in changing car ownership. Hence, there might be a point where the car in fact has changed possessor without either a or b knowing. Still, it will be possible for any time point to reconstruct the legal situation. Hence, ownership is not undefined but simply not (yet) reflected in the doxastic states of a and b . Given that we would certainly claim that a and b should be members of the relevant group for ownership, it would be inappropriate to assume that joint common knowledge in the relevant group is *necessary* to establish ownership (and other social agreements). (This is, by the way, one of the major differences between our approach and Truckenbrodt, 2009). We will confine our claim to those cases where it is *sufficient*. We will not, initially, consider cases where unknown legal facts stand against making an arrangement by joint approval of the relevant group.

The following fact about social agreements might be proposed to capture these intuitions:

(SF1) For all worlds, social facts ϕ and relevant group C for ϕ :

$$CB_{C,w}(\phi) \rightarrow w \in \phi$$

There is a problem with this assumption, though. In the long run, we will want to tie subjects' intentions and actions to their knowledge about the social nature of speech acts. They should know, for example, that assertions about factual knowledge can be *false* whereas speech acts can only be *refuted* or *not accepted* but not claimed false, etc. Therefore, the different nature of speech acts should not only be reflected at the level of truths but need to

be retained in the subjects' believes. If we embed (SF1) as a speaker belief, we get a property that follows for all propositions ϕ by logic:

$$B_{c,w}(CB_C(\phi) \rightarrow \phi)$$

(see Lemma 3).

The difference between believes about facts and believes about social agreements seems to be more deeply hidden. If we go back to the *Eiffel tower* example, we can imagine that one person c_1 in the group of listeners is clever enough to know that the Eiffel Tower is not in Bonn but in Paris. In this case, c_1 can know that everyone else individually believes that p ('the Eiffel Tower is in Bonn') and still be convinced that $\neg p$ ('the Eiffel Tower is not in Bonn'). A similar case for social facts seems unconceivable.

In order to streamline intuitions, let us consider another simple example. Assume that a and b play a joint game. Each day, they agree in the morning who of them is supposed to be the King of the day $K(x)$. The king of the day enjoys some well-defined privileges on which they also both agree. This seems a clear case where

$$CB_{\{a,b\},w}(K(x)) \rightarrow K(x, w)$$

It also seems that the fact "x is king" (for $x = a$, or $x = b$) is *veto-able*. If any single person believes that x is not the king, then x can not be the king.

$$B_{a,w}(\neg K(x)) \rightarrow \neg K(x, w)$$

$$B_{b,w}(\neg K(x)) \rightarrow \neg K(x, w)$$

In contrast, it is not sufficient for single persons to believe that x is the king for that fact to hold true.

(my notes: various ways to cash that out wrongly)

Various ways to tie single beliefs to the common joint belief turn out to be too coarse grained (see p. 6, notes). We need to be more specific about ways in which members of the group C can relate to a fact p .

$$\text{Ignorance: } \forall c \in C \exists w'(w R_c w' \wedge w' \in p) \wedge \\ \exists c \in C \exists w'(w R_c w' \wedge w' \notin p)$$

'all members hold p possible, and at least one also holds $\neg p$ possible'

In this case, C does not agree because some members don't have a

definite opinion as yet. Under these circumstances, the social agreement fact p could be true, even though not everyone agrees, and it is possible that isolated members of C already know this as an independent fact. Importantly, this can not happen in a *thing* scenario but only in cases where external laws and rules might settle p by default.

Veto: $\exists c \in C \forall w' (w R_c w' \rightarrow w' \notin p)$
 ‘one member of C thinks that p is not true.’

In this case, p is truly veto-ed, and c is a veto voice. We have argued in the above example that true veto is sufficient to render a fact false.

Note that the common ground (or even more official versions thereof) will not distinguish between Veto and Ignorance. In both cases, we can safely say that

$$\neg CB_{c,w}(p)$$

but this does not tell us whether one member said “I don’t know” or “I object”.

How can we turn this into joined believes of members of C : It seems that any one member in C can only be sure of p if he simultaneously believes that there were no objections:

$$\text{For all } c \in C: B_{c,w}(p) \rightarrow \neg \exists c' \in C \forall w' (w R_{c'} w' \rightarrow w' \notin p)$$

And this should be turned into individual beliefs, and a mutually shared belief about social facts p :

$$\text{For all } c \in C: B_{c,w}(p \rightarrow \neg \exists c' \in C (B_{c'}(\neg p)))$$

This is much stronger than what holds for “ordinary” facts (the Eiffel Tower case offers a counterexample). It should by no means follow from any logical assumptions about belief in general—to the contrary. We take it to be a piece of world knowledge that is shared by all speakers who are competent for the social fact p . It could be paraphrased as “I can not take p for granted as long as I know that someone definitely objects to p ”. The existence of ignorant members is possible.

2.2. Worlds, times and futures: A brief remark

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2.3. Speech acts as updates of mutual joint belief

We will now turn to exemplify the envisaged analysis of speech acts as updates of common ground. We will consider a typical commissive act, a directive, an act of mutual commitments, and a declarative which involves societal commitments. We thereby want to illustrate that the approach covers a wide variety of acts, unlike most earlier analyses.

a. promise

Speaker a states towards addressee b “*I promise (you) to stop smoking*”. (The addressee may be singular or group individual.) The relation *PROMISE* holds between subject referent a , addressee b and some proposition p which is usually expressed in the infinitival or clausal complement. (Indexical reference is possible like in “*I’ll never smoke any more. Promised.*”) *PROMISE* denotes an agreement between a and b about their future interaction: that (i) a will take action to bring about p in reasonable time, and that (ii) b has permission to exert mild social pressure on a in all those cases where a fails to cohere to (i). There are no direct legal implementations of promising, and hence verbal acts are, as far as we can see, the only way in which this kind of agreement between a and b can be reached.

The felicity conditions of a promise (Austin, Searle) include that p should be something of which the speaker believes that it is agreeable to the addressee and that a would not normally do p unless to please the addressee. Hence, the addressee has no reason to object to an update of the common ground on basis of his personal desires. Likewise, the felicity conditions include feasibility of p which is one indication of the speaker being sincere. (Promises of the unfeasible are certainly insincere promises.) More generally, the update will only take place if the addressee has reason to believe that the speaker is sincere.

In case all these conditions hold true, an update of the common ground will take place. Due to the nature of social contracts, the commitment is binding because both involved parties believe that it is binding.

$$CG_{\{a,b\},w}(\lambda w'PROMISE_w(a,b,p)) \rightarrow PROMISE_w(a,b,p)$$

As was discussed above, both speakers also *know* this entailment; but remember that due to Stalnaker, this would also hold for non-social facts ψ .

$$CG_{\{a,b\},w}(CG_{\{a,b\}}(\lambda w'PROMISE_w(a,b,p)) \rightarrow PROMISE_w(a,b,p))$$

What is special, however, is that both parties individually know that the other does not object (“no”); in addition, belief about promises that were installed by a speech act between a and b will be belief

that comes about by directly witnessing the relevant act.³

The list of conditions that were called “felicity conditions” in the literature serve to minimize the likelihood that the addressee refutes an update. If the update takes place, it is even binding if the speaker was insincere: We face a case of divergence between common ground and mutually joined beliefs like the ones discussed in Stalnaker (2002), and the common ground is binding for official social contracts between speaker and hearer.

A promise, once issued, is binding for party *a* unless the second party *b* releases *a* from the contract. *B* will signal that no social pressures will follow if *a* fails to comply to case (i). It is rarely discussed that the addressee *b* can also refute an update with *a*’s commitment even if *a* may be sincere at that moment. This typically happens if *b* finds it too tedious to exert social pressure all the time to give substance to the binding nature of the commitment, or if *b* wishes more drastic means of reinforce *a* to act. Technically, in these cases, the addressee does not release the speaker from a commitment but denies that this kind of contract is adequate.

(3) *Notorious drinker: I won’t touch the bottle any more in my life. Promised.*

Addressee: Oh, forget it. I can’t check all the time whether you drank. You need to go to a clinic and be locked away from the booze.

(4) *Company owner: We will decrease the emission of CO₂ by factor 10 till 2012. Activist: Oh forget it. What we need is a law which states clear sanctions if you fail to.*

b. order

A speaker *a* utters towards addressee *b*: “*I order (you) to come in.*” The relation ORDER holds between subject referent *a*, object referent *b* and proposition *p* which is expressed by the infinite or clausal complement (plus object control). If there is no object expressed, the addressees instantiate the second argument of the relation. ORDER_{w,t}(*a,b,p*) holds true if the future time courses of *w* at time *t* are as follows:

there is a future *t*’ where *b* accepts the order, and
either future futures *t*” where *b* does something to bring about *p*
or future futures *t*” where *a* takes sanctions because *b*

³ The notion of belief seems ticklish here; if beliefs are really only bits of knowledge that the speaker is dead sure about, they are not the kind of belief that drives everyday action. In any case, there is a difference between the belief “the kitchen is on fire” which can be checked against reality (“actually it was only a smoking cigar in the trash bin”) and the belief “we have just agreed that I will do *p*” after having uttered “I promise to do *p*” towards a nodding addressee.

did not take action (or something else “goes wrong”)
or

there is a future t' where b refutes the order, and
future futures t'' where a takes sanctions because b did not take action (or something else “goes wrong”)

Notice that we distinguish between *successful order* and *accepted order*. We feel that there are two ways in which an order can fail. Either, the speaker is not in a position to order anything at all. In that case, b could react by saying “wait a minute, you’re not entitled to give me orders at all”. Here, b refutes the order by *pointing out* that a is not in any position to take sanctions at all. Or the addressee understands the order but immediately announces that he does not plan to take action. This case differs from the case where b accepts the order, puts himself under an obligation, and fails to comply. For instance, in the case of declining, a can decide to abstain from sanctioning actions and no obligation will ever arise for b . In the case of acceptance by b , b will be under the obligation to bring about p even if a might in the long run abstain from sanctioning b for not complying to that obligation. (In other words, there are many ways in which b can get off the hook!)

An update of the common ground by $\text{ORDER}_{w,t}(a,b,p)$ is tantamount to the statement that a has informed b in some detail about a ’s future plans. This information is acknowledged by b (else it would not have made it into the common ground) and is likely to influence b ’s future actions, too. Notice that the newly reached information state of b suggests two actions after the utterance: Firstly, and immediately, give direct or indirect evidence whether the order is accepted (“ b announces that he intends to act towards p ”) or refuted (“ b announces that he does not intend to act towards p ”). Secondly, depending on step one, take action towards p or face the consequences.

This analysis answers a worry that was raised in the first part of the lecture, where we reviewed traditional classification systems for speech acts. Does an order commit the addressee to respond? Or does the order, as is more intuitive, commit the addressee to do something about p ? An analysis like ours will predict that ORDER is a relation between persons, propositions, times and worlds which primarily lays out possible future courses of events, paired with a statement of a which ones he’ll make more likely by his actions. It’s up to b to react, and in many cases b will react towards p : “ a has the authority to order b ” usually means that a has the means to punish b effectively. The analysis is flexible enough to include all kinds of further courses of events after an order has been issued. a can have little authority but b does p anyway. a can be a tyrant but b can decline to act. b could even be spared the consequences, in

case that new and unexpected things happen, and still the order would have been a fully valid order at the time of issuing.

$$CG_{\{a,b\},w}(\lambda w'ORDER_w(a,b,p)) \rightarrow ORDER_w(a,b,p)$$

reflects the intuition that *ordering* is *informing the addressee about what a's plans are*. All subsequent actions follow.

c. bet

Let us not turn to speech acts that can result in rather elaborate plans of bilateral action. Assume that *a* states towards *b*: “*I bet 10 \$ that Black Beauty will win the race*”.

This utterance includes a specification of all arguments that are needed for the BET relation. BET holds between two parties *a* and *b*, a proposition-in-question *p* (‘that Black Beauty will win’) and a value argument that specifies the goods to be exchanged. *p* must be such that the truth or falsity of *p* can be known by *a* and *b* only after the utterance. $BET_w(a, b, v, p, t)$ is true at world *w* and time *t* iff

for all future continuations w, t' where $CG_{\{a,b\},w,t'}(p)$, *b* has the obligation to give *v* to *a*.

for all future continuations w, t'' where $CG_{\{a,b\},w,t''}(\neg p)$, *a* has the obligation to give *v* to *b*.

The clause “*x* has the obligation to give *v* to *y*” could be further spelled out as “*x* gives *v* to *y* or something goes wrong”. Note that many laws explicitly prohibit prosecution for debts in betting.

If a bet is offered by *a* to *b* in a suitable utterance, the bet counts as not established before *b* has accepted the bet, i.e. signalled agreement to enroll in the plan as proposed. However, if both involved parties agree that the bet is up, the bet is up as a consequence.

$$CG_{\{a,b\},w}(\lambda w'BET_w(a,b,v, p, t)) \rightarrow BET_w(a,b,v, p, t)$$

If the bet is offered in a less explicit utterance, it will put the interlocutors into a situation where either the bet is declined (specifically if necessary parameters remain unspecified) or taken up by the addressee *b* who can specify the parameters further “*Accepted. I bet 20 \$ that she'll loose.*”.

The present analysis captures all aspects about *bet* without any need to class *bet* into a speaker commitment, a hearer commitment, or a prediction. Notably, the use of *bet* to make a prediction follows naturally. An utterance like the following could be understood as a bet for nonmonetary values *v* (like social

esteem, admiration for one's predictive powers).

- (5) A to B, showing no inclination to specify a value v :
I bet that it will rain tomorrow.

In this case, no bilateral agreement on joint action is arrived at, and B can at best react like to any ordinary predictive assertion about the future. An investigation why *I bet* is used to make the addressee more inclined to update his belief state will belong to the discussion of the assertion case.

d. marry

Let us finally take a look into speech acts of the kind classed as "conventional" in Bach + Harnish. Imagine that a , b , and z (= the priest) come together in church under the right kind of circumstances. They go through the prescribed procedure, which consists, say, on the following exchange:

- (6) z to a : *Do you want to marry this man, b , and be his true wife for ever?*
 a : *Yes, I will.*
 z to b : *Do you want to marry this woman, a , and be her true husband for ever?*
 b : *Yes, I will.*
 z : *I hereby declare you husband and wife.*

(For the sake of dramaturgy, imagine that we still live in a society where no additional acts at town halls are necessary.)

In essence, this is a contract between two persons and society as a whole. In the first place, society as a whole has decided (for better or worse) that the enterprise of man and woman to life together, and possibly raise children together, creates sufficiently many points of conflict that the general public should promote certain types of interaction and sanction others. Whether promotion or sanction is asked for will in part depend on the commitment of the involved parties to regulate their situation on their own (raise children, buy food, earn money, etc.). I will not consider the religious dimensions of marital life. In a ceremonial act like the one described, society has delegated their right to class persons into legal categories ("married" vs. "single") to single individuals. These individuals have to take charge that all necessary prerequisites are taken (e.g. check that none of the two is already married). If the necessary premisses are settled, the person in charge has the right to declare, on behalf of society, that the two involved persons change status from that time on.

What is the relevant group for this change of common ground? It should include the priest, the woman and the man: $\{z, a,$

$b\} \subset C$. But given that this is an agreement between society and two people, in some sense society as a whole agrees that whenever any part is informed about the act in retrospect, they are obliged to *update their belief state accordingly and without objecting*. This is reflected in many additional rituals that come along with marriage. The long announcements beforehand are meant to ensure that everybody who would potentially object to the update has time enough beforehand to do so. The ritual phrase of the priest “*Whoever has any reason to object to this marriage should talk now, or remain silent forever.*” explicates the communal agreement that objections against that marriage in retrospect are not allowed. The tradition to celebrate marriages in church with a wide public audience will ascertain a large number of eye witnesses, and corresponding legal documents can serve as a written backup.

We’d hence conclude that the common ground in such cases must be an abstract belief state that includes (some) beliefs of the direct witnesses of the ceremony, but is manifested by a body of legal documents, say, and in these is binding for every member of society. In some sense, this is a “common ground” not known by any individual person but constituted by the body of propositions that emerge in legally documented individual acts of marriage.

2.4. Comparison to Truckenbrodt (2009)

The approach that we pursue is very similar to a proposal made in Truckenbrodt (2009). Like we, he spells out social agreements in terms of Stalnaker’s common ground but attempts to link verb meanings, lexical meanings and mutual joint belief in an indirect manner. We will recapitulate his example of changed ownership as an illustration. In a first step, the lexical semantics of the verb *own* is defined in terms of mutual agreement as follows:

Given the set of relevant people C:

$OWN(w)(x, y) \leftrightarrow$

$\forall w' \in CG_c(w) \forall z \text{ in } C(USE(w')(z,y) \rightarrow$

$[AUTHORIZE(w')(x, \lambda w''. USE(w'')(z,y)) \vee \text{STH-WRONG}(w'')])$

“x owns y means, it is generally agreed in group C that if anyone in C uses y, then this must be authorized by x, or something goes wrong.”

If a group of speakers update their common ground by a predicate of that kind, the following derivation goes through:

$CG_c(w)(\lambda w'. OWN(w')(x,y))$
iff $CG_c(w)(\forall w' \in CG_c(w) \forall z \text{ in } C(USE(w')(z,y) \rightarrow$
 $[AUTHORIZE(w')(x, \lambda w''. USE(w'')(z,y)) \vee \text{STH-}$
 $\text{WRONG}(w'')]))$

iff $(\forall w' \in CG_c(w) \forall z \text{ in } C(\text{USE}(w')(z,y) \rightarrow$
 $[\text{AUTHORIZE}(w')(x, \lambda w''. \text{USE}(w'')(z,y)) \vee \text{STH-}$
 $\text{WRONG}(w'')]]))$
 (due to $CG(CG(\phi)) = CG(\phi)$)
 iff $\text{OWN}(w)(x,y)$

Overall, this analysis yields an equivalence: For all social agreement facts ϕ , $CG_c(\phi)$ iff ϕ . This equivalence is similar to the entailment that we propose, yet the present version is stronger (logical equivalence) and arrived at indirectly, via meaning postulates that spell out the communal beliefs that are constitutive for the relation in question. We warmly sympathize with the analysis but feel that some details are not as yet appropriate.

For one, it appears to be too strong to assume that social facts *require* being known by everyone in the relevant group C . We would like to claim that common knowledge provides a sufficient but not a necessary condition. This becomes clear once we consider more complex cases. We will remain in the realm of change in ownership: Assume that a wants to buy a car c from b . This involves a certain amount of paperwork along with nontrivial money transfer. Imagine that they agree that b does the legal paperwork while a settles matters at the bank. In such a situation it may be that, unbeknownst to either a or b the car in fact has changed owners (because all steps were taken) even though none of the two knows this. They can even in retrospect reconstruct when the change in ownership was accomplished, or ask “*is the car still mine or already yours?*”. If one takes mutual joint belief as necessary condition for ownership, one would predict that such a situation is impossible.

The paradoxical fact that a 's and b 's joint action can bring about facts that neither of the two knows may become more acceptable if we acknowledge that the private knowledge of a and b taken together does in fact suffice to determine ownership. If we consider “knowledge taken together” as a basis, we might even include legal documents as sources of knowledge, which will in almost all cases suffice to settle the current social(/legal) status of matters. However, the common ground is just *not* the knowledge of everyone taken together, but is limited to those pieces of knowledge which are publicly shared. So, the lexical reformulation strategy faces a serious dilemma. Either we're not talking about equivalent conditions but sufficient conditions — and can use the common ground update as a basis for “saying so makes it so” entailments. *Or* we want to use equivalent lexical paraphrases, but these may then not be *mutually shared beliefs* but *knowledge taken together* of the relevant group C . This kind of knowledge base contains the common ground (and hence update provides a sufficient condition) but its logic is completely unexplored, as far as we can say, and it is unclear whether transparency principles

analogous to $CG(CG(\phi)) = CG(\phi)$ can be expected to hold.

A brief check in the equivalence derivations above shows that the argument does use the fact that the lexical paraphrase was claimed to be *equivalent* to ownership. We need this assumption in the first paraphrase where “everyone believes that x owns y ” is equivalent to “everyone believes that everyone believes that whoever wants to use y must get permission by x ”.

A second, more general worry concerns the assumption that all social agreements are based on common shared knowledge about which communal obligations and privileges come along with that agreement. Consider the case of *marriage*. Lawyers in Germany reconstructed that *a being married to b* is equivalent to the content of some twenty-ish individual legal contracts. Certainly, we would not want to claim that only speakers who master the content of these contracts are in lexical command of the speech act of *declaring husband and wife*. What everyone assumes is much more shallow, like “declaring them married makes them married, and makes all rules applicable that refer to married couples”. This, we think, comes closer in spirit to a shallow entailment like $CG_c(MARRIED(w,x,y)) \rightarrow MARRIED(w,x,y)$. Again, we only make use of the one-way entailment because we do not want to settle the relation between “knowledge taken together” and “mutually shared belief”.

Much of the discussion on update, acceptance, refutation and presupposition of speech acts in Truckenbrodt (2009) carries over to our version, as we will point out in the next section on accepting and refutation. There is one aspect though which we might lose if we give up an analysis where facts follow from the transparency principle of common ground. As has been pointed out, speech acts do not readily allow for quantification over the addressee; an exception is posed by universal quantifiers and conjunction. Hence, the following attempted explicit speech acts are infelicitous (see Krifka, 20xx).

- (7) **I (hereby) promise some of you to give you chocolate.*
**I (hereby) order someone to open the door.*
**I (hereby) baptize most of you „Bobby“.*

Truckenbrodt explains these facts by pointing out that the addressee argument of the explicit performative is quantified over. Given that his semantic derivation is not very explicit so far, we will try and use the *OWN* example and changes in ownership to illustrate the analysis. The idea is this: The owner A of a watch Z addresses a group of hearers C and states “*I hereby give this watch to one of you*”. This leaves the future owner of the watch undetermined. An update of the common ground to

$CG_c[\exists x(x \in C \wedge OWN(w, x, Z))]$

will take place. The lexical paraphrase then can just amount to

$CG_{c,w} [\exists x(x \in C \wedge \forall w' \in CG_c(w)(\forall c \text{ in } C(USE(w')(c,Z) \rightarrow$
 $[\text{ AUTHORIZE}(w')(x, \lambda w''. \text{ USE}(w'')(c,Z)) \vee \text{ STH-}$
 $\text{WRONG}(w'')])]]$

As the existential quantifier intervenes between the two universals in the CG-condition, CG-reduction is no longer possible. Therefore, the speech act is infelicitous—technically, *hereby* expresses causation in Truckenbrodt’s account, and the sentence would falsely assert that its utterance causes a change in ownership.

An exception are situations where all parties agree *who* will be the one who gets the watch (specific indefinites or hidden definite descriptions like “*the one who grabs it first*”). In this case, the DP can take wide scope and the speech act is felicitous—which is an empirically justified prediction.

This explanation is certainly both intuitively on the right track, and appealing in that no further assumptions are made about the logic of speech acts (unlike Krifka, 200x). Still, we think that a fuller analysis needs to spell out the relation between the addressee argument of explicit performatives and the addressee parameter of the context of utterance. Notice that an explicit performative requires that the addressee argument has to refer to an element in the group of actual addressees:

- (8) *I (hereby) promise to shave Jones.*
- (9) *I (hereby) promise you to shave you.* (addressed to Jones)
- (10) **I (hereby) promise Jones to shave him.* (if Jones isn’t present)

It was argued in the example part (xx) that acts of promising express a self-commitment of the speaker to bring about *p*. In all three cases above, *p* = ‘speaker shaves Jones’. The addressees are supposed to control the commitment. In the “else” case where the speaker does not come up to the promise, the addressees are allowed to exert mild social pressure on the speaker. (4) shows that the commitment ‘to shave Jones’ can be controlled by a third party addressee. (5) exemplifies the case where the addressee in control is Jones himself. (6) demonstrates that the presence of a third party addressee is not sufficient to control a commitment about Jones — even though this makes perfect sense, as seen in (4) — if the addressee argument of the performative refers to Jones. In conclusion, a full semantic analysis of explicit performatives will require a step where the addressee argument and the addressee as an utterance parameter are identified. The addressee parameter of

the utterance context is an indexical and hence can only be referred to by indexical expressions, possibly including universals in a group reading. We hope that an explanation of (3) in the spirit of Krifka's QiQA paper will be feasible.

2.5. Updates

In this part, we will take a closer look at possible updates with explicit performatives. Schematically, the explicit performative is expressed by speaker a in an utterance of sentence S at time t_o towards addressee b .

(11) a : "S" to b

In the first step, the addressee b will compute the sentence denotation $[[S]]$. The denotation will typically be *about* the speaker a , *about* the addressee b , and *about* the time t_o . Hence, the sentence will denote an untensed proposition like the following.

(12) a : „I order you to give me a \$" to b .
 $\lambda w. ORDER(a, b, p, t_o)(w)$
 where $p = \lambda w' \lambda t' (GIVE(b, a, \$, t', w'))$

The addressee b will now do a brief check of those conditions that were classed as preparatory and propositional content conditions by Searle. We will treat this as a presupposition check, and cases where b refuses an update for these reasons will have the same status as presupposition failures. This is in line with the observation that speech acts can be rejected with the *Wait a minute* refusal (von Fintel, xx?) that is typical for presupposition failure.

(13) *We can drive to the concert in your Mercedes.*
 — *Wait a minute: I don't own a Mercedes!*

(14) *I order you to give me a Dollar.*
 — *Wait a minute: You can't order me anything!*

The list of plausible refusals can be extended; typically, objections point out violations of preparatory and propositional content conditions. It needs to be kept in mind that these conditions, unlike "true" semantic presuppositions, are vague and subject to b 's judgement. For instance, is it really desirable to receive a muddy sandcake as a gift? And yet, which parent would decline the promise of their four-year old "*I promise to bake you a sand cake*"?

If the addressee decides that no presuppositions are violated, $\{a, b\}$

will perform an update of their common ground.⁴ It does not hurt if more spectators are present as witnesses; some SA might even carry the lexical option to express that this is so (“*declare before witnesses*”). We will concentrate on the pure speaker-hearer interaction for the moment. Shortly after utterance time t_o , an update will take place. Schematically:

$$(15) \quad CG_{\{a,b\},w,t+1} := CG_{\{a,b\},w,t} \cap [[S]] \\ \text{hence in } w: [[S]] \text{ (by assumption about social facts)}$$

The fact that a should update corresponds to Austin’s and Searle’s sincerity conditions. No matter which secret plans a might follow, he is has now officially agreed to the joint belief that S has been updated, with the consequence of turning the content of S into a fact.

In our example, as soon as it is mutually (officially) shared belief between a and b that an order has been issued at t_o , the order has been issued.

$$(16) \quad \text{In } w: CG_{\{a,b\},w,t+1} (\lambda w. ORDER(a,b, p, t_o)(w)) \\ \text{hence in } w: ORDER(a,b, p, t_o)(w)$$

Of course, b is still free to refuse to comply. b : “*No, I won’t give you 1\$.*” We don’t think that this should correspond to an un-update of the common ground or the like. These reactions are already part of the future possibilities of worlds where an order is issued.

$$(17) \quad \lambda w. ORDER(a,b, p, t_o)(w) \\ = \{ w \mid \exists t (t_o < t \wedge p(w,t)) \vee_{\text{excl}} \exists t (t_o < t \wedge \text{sth.wrong}(w,t)) \}$$

The lexical paraphrase of “order” in (17) is meant to convey the following: In all worlds w where an order has been issued that p , either p happens at some (reasonable) time after t_o or else, we enter one of the *something.wrong* future branches. In the case of an order, we’ll think of such branches as “*a punishes b for not doing p*”. Legal orders come along with very explicit deadlines t and sanctions *sth.wrong*. Yet, *sth.wrong* future branches can also lead to b just being mildly disapproved, they could be entered because a hurricane releases b from the obligation to do p , etc. We finally want to clarify that we chose to assume that p comes as a fully specified proposition which is derived from the syntax of the sentence. In the present example, p comes about, roughly, by the denotation of the infinitival complement, including the control subject: $p = \lambda t \lambda w GIVE(b, a, 1$, t, w)$, and including a side clause that it is b who should cause p to happen.

⁴ We leave it open at this point whether we talk about mutual joined beliefs — i.e. the “no afterthought” idealization — or a more public common ground which need not match the interlocutors’ private beliefs in all details.

As soon as *a* and *b* are in one of the worlds in (17), and know that they are in a world like in (17), *b* can choose his next action. If *b* chooses to refute, it becomes clear very early that the world of *a* and *b* will develop into one of the *sth.wrong* branches. Yet, this choice is part of the situation created by the speech act—it is not a situation that arises by *b*'s refusal to update. Similarly, *b* can decide to show signals of approval. In this case, *a* and *b* will act on the assumption that *b* plans to bring about *p*. Once again, *b* can fail eventually to do *p*—and the *sth.wrong* branches will specify what happens in that case.

In the current picture, the addressee *b* has two ways to object. One type results in a non-update of common ground, the other is defined within the content of the speech act. Given that objections are often expressed by the word *no*, it might be helpful to offer examples for linguistically and stylistically wellformed objections of different kinds.

| type of negation | reacts to utterance | worded as |
|------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|
| refusal to update CG $B_b(\neg[[S]])$ | assertion S | “no” “I disagree” |
| update of CG by negative proposition | (positive) yes-no question Q? | “no” |
| refusal to update CG | explicit performatives; felicity conditions violated | “you can’t do that” (or even more detailed) |
| negative reaction to speech act (after update of CG) | explicit performative with an option to react | “no”, “you needn’t”, “I won’t”, “we shouldn’t”, ... |
| refusal to act | imperative | “no.” |
| refusal to accept | certain expressives | “I do not accept your excuse” |

A final remark on the logical setup of our proposal. In this draft, we did not use dynamic semantics to keep matters simpler. However, the meaning and use of performative utterance seems to be a typical case where the meaning of sentences consists in their context change potential (Heim, 82), in a very substantial sense. Many explicit performative verbs allow explicit reference to the addressee. We have noted in the last section that the object argument of performatives needs to be instantiated with an indexical that refers to the addressee in the utterance situation. (The same holds true for the subject argument and indexical *I/we*.)

The facts are blurred, though, because third parties can delegate the speaker to make an utterance *on their behalf* : “*The king hereby announces ...*” where it is clearly not the king speaking.) If we represent the meaning of explicit performatives as context change potentials, we’d gain a place where we can implement the shortcut between subject and object argument of the performative verb, and the set of subjects who maintain a mutually joint belief:

- (18) *I (= Anna) order you (= Bertha) to give me 1\$.*
 $\Rightarrow \lambda C.(C \cap \lambda w.ORDER(a,b, \lambda t\lambda w.GIVE(b, a, 1$, t, w) , t_o)(w))$
 presupposed: C is CG_x with $\{a, b\} \subseteq X$

While we are not as yet in a position to spell out this link in full detail, we should keep in mind that the semantic content of explicit performatives in part restricts possible utterance situations where a performative use is possible.

2.6. The progressive puzzle

At this point, we have established a well-defined link between the utterance of a performative sentence, its truth conditional meaning, a common ground update, and the establishing of a new social fact. We can now fill in some details. Specifically, we will sketch how tense and aspect contribute to the truth conditional meaning of an explicit performative sentence, and why progressive aspect is not suitable to make a speech act. We will take a classical Reichenbachian analysis of simple and progressive tense as our starting point. This requires to explicate an event argument for the performative verb. As a warming-up, let us represent an utterance like in (18), in the refined Davidsonian analysis.

- (19) *I (= Anna) order you (= Bertha) to give me 1\$.*
 $\lambda w[\exists e(ORDER(a,b, \lambda t\lambda w.GIVE(b, a, 1$, t, w) , e)(w) \wedge R=S \wedge \tau(e) \subseteq R]$

Following common notation, we use R for the indexical reference time of the utterance, S for speech time, and $\tau(e)$ for the running time of the event *e*. The equation $R=S$ is contributed by the interpretation of present tense, and $\tau(e) \subseteq R$ interprets simple aspect. In a progressive sentence, $R \subset \tau(e)$ will be the corresponding relation between reference time and event time.

Against this background, we’ll take a closer look at the facts of English, and German. We will find that the situation is not as crystal clear as one might wish. English textbooks and grammars for learners usually recommend to use performatives in the simple tense. We will use the following sentence pairs to illustrate the rationale behind this recommendation:

- (20) *I hereby declare the meeting closed.*
#I am (hereby) declaring the meeting closed.
- (21) *I hereby fire you from the company.*
#I am (hereby) firing you from the company.

The simple tense versions are wellformed performative sentences and will, given all other circumstances are of the right kind, successfully bring about a speech act. In the progressive versions, in contrast, the speaker appears to comment on something *else* he is doing at that moment. In (20), he might be talking and at the same time ringing a bell, by which conventional act the meeting is closed. In (21), he might be talking and at the same time sign a letter which constitutes the actual firing. The effect strengthens if (i) *hereby* is omitted, or (ii) replaced by a temporal adverb like *just*.

- (20') *I am just declaring the meeting closed.*
 (21') *I am just firing you from the company.*

These two sentences can not be used in performative utterances, they stably convey comments on other acts. If we take a look at German, the facts are even clearer. German has a quasi-progressive *am NN. sein* ('be at doing NN.')

which is grammaticised to different degrees in different parts of Germany. Sentences in the present tense quasi-progressive reliably can not be used in performative utterances. We use # to signal this unsuiteness (the sentences are grammatical and can be used coherently in other contexts, of course).

- (22) *#Ich bin am das Meeting eröffnen.*
#Ich bin am Sie begrüßen.
#Ich bin am Sie feuern.

The use of tense adverbial *gerade* (= 'just') likewise makes a sentence unsuited for a performative utterance.

- (23) *#Ich eröffne gerade das Meeting.*
#ich begrüße Sie gerade.
#Ich feure Sie gerade.

All these data strongly suggest that the progressive aspect is not suitable in a performative utterance. Yet, any serious attempt to explain this will have to deal with the fact that English speakers do indeed use the *be+participle* verb form in performative utterances. In the times of internet, it is easy to harvest examples, and even a superficial exploration shows that such uses are by no means stylistically degraded, informal style, low register, sloppy talk, non-native usage, or suffer any other kind of defect. Passages like the

following can easily be multiplied.

- (24) *So I **am hereby promising** to the world this: I WILL BECOME A MULTI-MILLIONAIRE IN LESS THAN 5 YEARS!*
- (25) *I **am hereby promising** my friends here that I will not eat chips at the Mexican restaurant today.*

A very dirty statistics also shows that progressive performative utterances on the internet are rare in comparison to the much more frequent simple tense performatives. Just to give some numbers: “*am/are hereby declaring*” elicits \approx 2000 hits, in contrast to 706.000 hits for “*hereby declare*”; the numbers for *resign, announce, promise, order, recommend* and *warn* were similar. (date: 2.6.2009; Google). We also checked for possible future tense performatives, and found rare hits for both *will* and *going to future*. Again, we offer examples.

- (26) *This is America and I **will hereby** offer to smooch whosoever needs smooching out front of whatever tattoo parlor they want.*
- (27) *I heard not so long ago that MP3's actually disrupted brain patterns because of the digital signal created - as in the peaks and troughs in sound are square as opposed to analogue which is spiked and linear. I **am going to hereby** coin this as the Corey syndrome!*

Attested performatives in the *be+participle*, and performatives in future tense forms, defy all simple generalizations like “progressive aspect is disallowed because the speaker has to be certain that the full act/utterance will happen before he can believe to make a speech act”. Speakers *can* announce and thereby make a speech act, as all above examples confirm. And yet, there is a stable intuition about English progressive “in a certain sense”, mirrored by an equally stable intuition about German quasi-progressive sentences, that progressive aspect is semantically inadequate for performative utterances.

In the discussion of English data, we carefully distinguished ‘sentences with the *be+participle* verb form’ from ‘sentences in the progressive aspect’. The former is a morpho-syntactic property, the latter is semantic. It is well-known that English *be+participle* can be used in a number of ways which are derived from the semantic progressive, but are clearly distinct in meaning. (German quasi-progressives are not as firmly rooted in grammar yet, and always convey the semantics of progressive aspect.) Specifically, the *be+participle* form can serve to make statements about future events where the speaker wants to convey that these future events are “certain to happen” in that all preparations and arrangements have been settled already. Grammars comment on the following

type of example:

(28) *We are playing tennis on Sunday.*

“Such uses of the progressive are allowed if the speaker wants to convey that the tennis match is already arranged, that the court has been booked, that the players have been invited etc.” (Leech, xxx)

We will pursue the following large picture of tense and aspect in performatives.

1. In English, the simple present tense is allowed and even preferred in performative utterances. Performatives differ from descriptive episodic sentences; the latter usually require the use of present progressive. This needs to be explained.
2. Performative utterances do not tolerate the semantics of progressive aspect. This is confirmed by German quasi-progressives, and English progressives without *hereby*, and with additional *just*.
3. In English, performative utterances can show verbs in the *be+participle* form. These verbs do not denote progressive aspect, however. Most likely, they are used in the ‘imminent future’ sense which is also available to this verb form. We will not consider such performatives as evidence against (2).

We can now turn to an explanation of 1. and 2.; a detailed analysis for the *future be+participle* in general and its use in performative utterances in particular is beyond the limits of the paper. We will start with the simple present tense in felicitous performative utterances, and repeat (19) here.

(29) *I (= Anna) order you (= Bertha) to give me 1\$.*
 $\lambda w[\exists e(\text{ORDER}(a,b, \lambda t\lambda w' \text{GIVE}(b, a, 1\$, t, w') , e)(w) \wedge R=S \wedge \tau(e) \subseteq R]$

In response to point one, we assume that performative utterances use the speech time parameter in the literal sense of “time span which lasts as long as the utterance takes”. Hence, S starts when the utterance event *e* starts and ends when it ends. Therefore, $R=S=\tau(e)$. As a consequence, performatives are predicted to allow extended speech time S. Most other sentences in English show aspect patterns which suggest that S is a non-extended point; notably even episodic sentences that report very short accomplishments can normally only be used in the present progressive, not in the simple present. The only exception to this rule are episodic sentences in the reporter’s present which suggest

that the reported event takes as long as the reporter's utterance. If you wish, present tense in performative utterances is something similar to the so-called reporter's present.

Let's next take a look at (28) in the progressive version, and interpreted in the progressive aspect.

- (30) *I (= Anna) am ordering you (= Bertha) to give me 1\$.*
 $\lambda w[\exists e(\text{ORDER}(a,b, \lambda t\lambda w'\text{GIVE}(b, a, 1\$, t, w') , e)(w) \wedge R=S \wedge R \subset \tau(e)]$

The semantic representation of (29) includes information about the speaker's focus of attention. Temporal reference points tell us something about the view that a speaker takes on the reported events, which is his or her personal "window" on the event; in fact, the S,E,R-system is often seen as the most logically explicit form to make sense of perspectival metaphors in the grammar of tense. $R \subset \tau(e)$ holds true if the speaker is an observer of e , mentally focussed on some inner part of an ongoing event e . This seems incompatible with the speaker attitude of a performative utterance. Whatever the speaker's perspective in bringing about an act by making a statement may be, an inspection of the ongoing utterance event in its parts is unsuited. A non-theoretical paraphrase of the effect could look like this: "How can the speaker be focussed on addressing me, the addressee, the one who is supposed to update her belief state and hence make a social agreement true? The speaker does not seem to be focussed on me. The speaker instead invites me to observe something e that is going on *from an inner temporal region*; the thing e supposedly going on is the speaker putting an order, somehow. But the utterance expresses the intention to present an internal view on something going on, it can not itself *be* the thing going on." Our so far purely descriptive diagnosis is this: The semantics of sentence aspect indicates the intentions of a speaker. Specifically, progressive aspect indicates the speaker's intention to describe something. The intention to describe something is incompatible with an intention to perform an act. Hence, the utterance in (29) will be understood as describing some order; the utterance can not itself be the entity that verifies the existential statement.

This intuition is reflected in the following requirement.

- (31) *If an utterance e is intended to count as a speech act, i.e. that utterance that brings about a new social agreement, then its sentence aspect must be such that the duration of the utterance e is fully included in the reference time of that utterance R .*

More formally:

(32) *Let u be an actual utterance with real duration $\tau(u)$. Being an utterance, u has also a reference time R_u . For any social agreement property ϕ :*

$$R_u \subset \tau(u) \rightarrow \neg\phi(u).$$

This allows us to predict that utterances u in the progressive aspect can never count as acts of social agreement. We'll illustrate the effect by getting back to the representation of the progressive utterance u above. We use R_u to make it explicit that the reference time index is the one of that very utterance.

(33) $\lambda w[\exists e(\text{ORDER}(a,b, \lambda t\lambda w' \text{GIVE}(b, a, 1\$, t, w') , e)(w) \wedge R_u=S \wedge R_u \subset \tau(e)]$

Let us now assume that in some world, this actual utterance u were to be that element in the individual domain that makes the existential statement true. (Our plan is to lead this assumption to a contradiction.)

$$[(\text{ORDER}(a,b, \lambda t\lambda w' \text{GIVE}(b, a, 1\$, t, w') , e)(w) \wedge R_u=S \wedge R_u \subset \tau(e)]^{g(e/u)} = 1$$

Hence

$$[R_u \subset \tau(e)]^{g(e/u)} = 1, \text{ thus } R_u \subset \tau(u)$$

If that is so, we know that u can not be an act of social agreement, due to (32). Hence:

$$[(\text{ORDER}(a,b, \lambda t\lambda w' \text{GIVE}(b, a, 1\$, t, w') , e)(w)]^{g(e/u)} = 0$$

in contradiction to the assumption that the whole conjunction is true. Therefore, there must be a different event in that world which constitutes the order, q.e.d.

We'd like to briefly point out a welcome side effect of a fuller temporal analysis of speech acts. On basis of the Reichenbachian parameters, we predict rather than stipulate that performative utterances are utterances about a deictic time point (=R). The semantic representations in (28) and (29) no longer make extra mention of the time t_o of utterance, as we did in earlier sections. They relate the event of uttering/ordering to the time of reference R which is the time of utterance S. The time of the act ('order') is tied to the time of utterance as before, but not as an idiosyncratic feature of performative utterances but as a result of a fully regular standard interpretation of tense.

2.7. Proto Acts and other conventionalizations

Let us briefly return to an example for social agreements that we used in section 2.1: Three children a , b and c play the “who’s king” game. Every day, one of them can be declared king-of-the-day. No kid x is king unless declared so. x is king if all three kids agree that this be so. Noone is king if the kids don’t agree. This seems to be a clear case where saying so makes it so.

(34) a utters at t_o : „*I am king*“.

Child a has officially announced his willingness to update his personal belief state with the proposition $\lambda w.KING(a, t_o, w)$. For the other two, this is a true issue of agreement. The interesting case arises if one of them should not agree. Assume that b signals that he thinks that $\lambda w.\neg KING(a, t_o, w)$ is true in his belief states. He *veto*es the proposition “ a is the king”. In this case, it would not make sense for c to update his belief state by “ a is the king” either. The fact will only come about by mutual agreement, and given that b has vetoed, it is clear that no mutual agreement will be reached this time. Eventually, a will also correct his belief state and cancel “ a is king” from his set of beliefs.

In the described scenario, the addressees b and c don’t seem to have any option to object except by refuting the update of common ground. Remember that in the other acts in 2.5, refuted update was restricted to cases where presuppositions were violated. The addressees had a second chance to object, though, after the update was accomplished, thereby driving the world towards the *sth.wrong* continuations that were specified by the meaning of the sentence.

In the above example, one would expect that general consensus will be ensured before the speech act is issued after attempts to declare someone king of the day have failed repeatedly. Democratic polls do just that: ensure general consensus *before* anyone stands up and states “*I hereby declare Heinrich Büllkopp president of the German Federal Republic*”. As soon as the convention to establish consensus beforehand has been adopted, we can state that the speech act in (19) presupposes consensus, and refutations are no longer possible. Thinking in the other direction, the children could decide to establish *sth.wrong* courses of events, which would open up the option for the addressees to accept or reject the declaration.

Binary and general agreement: So far, there is a certain tension between our abstract considerations with respect to acts of social agreement, and the examples that we took a closer look at. According to our general considerations, acts of social agreement should standardly require a veto-check before individual belief states and the common ground get updated. In practice, we

restricted attention mainly to explicit performatives which concern an agreement between speaker and hearer. This was reflected in the recurring condition that what is at stake is $CG_{\{a,b\}}$ for speaker a and addressee b . The speaker can always be assumed to be willing to update, due to sincerity. Hence, the addressee b did not have to pay attention to any third party when making up his mind about the update of common ground.

In the case of a plural addressee we'll have to talk about pluralic belief, which might be driven by a logic very similar to the logic of social agreement in section 2.1. A natural application for *no-veto* requirements are declaratives where one person speaks on behalf of the general public. Consider a judge who declares someone innocent:

(35) *a: I hereby declare this person, b, not guilty of p.*
audience X, listening.

For one, a 's declaration can be void if important steps in the procedure were violated. However, there is also the option to re-open the case (i.e. undo the update of CG_x by the proposition " b is not guilty of p ") in case someone discovers further evidence. Both cases, in some sense, rest on the fact that *declaring someone not guilty* presupposes that all evidence has been taken into account, and all required steps have been observed.⁵ Any third party x can challenge these presuppositions, usually, the third party x is an advocate. This appears to be a case where single members of the community have the right to veto a social agreement.

The classical passage in weddings "*whoever has anything to object against this marriage may talk now or stay silent forever*" likewise is an invitation for the general public to voice veto against the imminent update of CG by "*I hereby declare a and b husband and wife*". Again, the audience may veto because they believe that the presuppositions of a marriage are not met (husband/wife already married, agreement of husband and bride being a matter of debate). The audience may not veto for personal reasons ("the husband looks stupid!"). A fake priest is, of course, also a good reason for the general audience to declare the marriage void, before or after. Yet, the sincerity conditions of marriage prevent that "*you are a makebelieve priest only*" is an objection that is part of the anticipated possible responses to the question.

The notion of mutual agreement also offers a natural limitation to which types of facts can be brought about by a speech act: only those facts that arise by mutual agreement. This offers a natural explanation in what sense *offense, flatter, entertain, bore* do not describe speech acts (at best, perlocutionary acts occur) and do not

⁵ Given that new evidence can arise at later times, the act of declaring someone (not) guilty carries the option for belief revision as a proper part. Interestingly, it is *not* possible to revise a statement if the *law* changes at some point, rather than the evidence.

allow a performative use. An *offense* is an utterance that results in the addressee *b* being annoyed, and the speaker *a* intends *b* to be annoyed by the utterance. However, *b* does not become annoyed because *a* and *b* agree that *b* should be. No matter how long two people agree that one of them should feel in a certain way, this does not make it true. Hence, the following dialogue will *not* take place.

(36) *a to b: You are hereby annoyed (by me)!*

CG_{{a,b},w}($\lambda w'.\text{ANNOYED}(b, t_o, w')$)
 does not entail
 ANNOYED(*b*,*t_o*, *w*)

Arguing from the veto direction, if *b* knows that *b* is not annoyed, then *a* can not force *b* to update by $\lambda w'.\text{ANNOYED}(b, t_o, w')$, simply because *b* is an authority of his own feelings. Hence, *b* could veto an update any time unless the proposition $\lambda w'.\text{ANNOYED}(b, t_o, w')$ was even true before an utterance of *a*'s utterance. But in this case, *a* makes an assertion and does not bring about a state of ennui. Likewise, *a* can't force a bored *b* to believe that he is entertained or amused, or an insulted *b* to believe that he feels pride and joy. What *does* help to transport emotions are expressions of the speaker's own emotions. This is one part of the pragmatics of expressives. We will turn to expressives in later parts of the lecture.

2.7. From SA to action

At the end of this part, the reader might worry how our proposed analysis of speech acts in terms of common ground update relates to theories which perceive speech acts as a special kind of human *act* rather than a special kind of mutual belief. We have not much to say in this respect, but want to clarify our perspective. We decided to follow the proposal that belief states are modelled by sets of possible worlds. Depending on the reader's favourite version of the theory, this set is possibly arrived at by intersecting sets of believed propositions. It is part of the logical paradigm that *belief* is used in a way that sometimes differs substantially from ordinary folk notions of belief. For example, I (= R.E.) am just sitting at my computer, working on a draft on speech acts. It seems natural to folk-attribute the following folk-beliefs to me:

I believe that I am getting tired.
I believe that having some coffee would do me good.
I believe that noone will, in the next 5 minutes, order me to pack my suitcase and trip to the North Pole.

It seems plausible to take these beliefs as reason for the following action: I get up and start the coffee machine to get some coffee.

Specifically, my trust that no unforeseen orders will reach me is part of my motivation to act. If I expected to be called off to the North Pole any minute, I'd maybe not want to switch on machines which could cause severe damage in case I'd forget to turn them off before leaving for the North Pole.

However, the last folk-belief—the one about the non-occurrence of certain things—is not a belief of mine in the sense of common ground as we used it earlier. If it were, then I could no longer react consistently to any newly incoming order which takes me by surprise. For instance, it is of course *logically possible* that someone with super-powerful authority might enter my flat, point a gun at me (loaded) and utter “*I order you to trip to the North Pole immediately!*”. Even though I do not hold this a realistic option at present, if it happened it should not catapult me into the inconsistent belief state immediately.⁶

Following proposals elsewhere in the literature, we'll assume that the set of worlds that are in principle compatible with our beliefs is much much larger than the set of worlds that we think of as likely. The degree of non-surprisingness of a world is a property which comes in addition to our qualification of the world as a possible world. While speech acts, in our analysis, primarily cut down our belief state (common and private), they will certainly also cause us to re-evaluate what we consider a likely world. For instance, if some person should enter my room and order me to travel to the North Pole at t_o , I will reject all those possible worlds where, at time t_o , such a thing does *not* happen, and I will maintain all those belief worlds where the order is issued and understood by me; belief worlds that I considered extremely unlikely until just before the incident.

We need to keep belief change and update two separate processes. Our semantic theory of performatives is intended to model speech acts as updates. The semantic part of this theory is *not* very elucidating when you think about what subjects must have believed *right before* a speech act. Logically, they must have believed “possibly, someone will perform speech act ϕ any minute”. However, judging from their actions, they often seem a long way from believing anything like that. We do not, and can not, offer a full account for the re-evaluation of possible worlds that takes place along with the act.

Summary

In this paper, we devised a link between truth conditional semantics and speech act theory on the basis of Stalnaker's model of update, belief, and common ground together with an assumption about the logic of social agreements. We propose that (certain) speech acts denote social agreements which

⁶ Even though the effect would certainly be something very close to that.

turn into fact as soon as everyone agrees that they hold true. Formally,

$$CG_X(\phi) \rightarrow \phi$$

where X = the set of relevant interlocutors, usually and minimally containing speaker and addressee, and ϕ a proposition that expresses a social agreement.

A performative utterance, according to this picture, has the following steps. First, an utterance takes place. This utterance will be semantically analysed in the traditional, truth conditional fashion, and leads to a proposition, plus presuppositions. The presuppositions of a performative utterance roughly correspond to what classical theories call *felicity conditions* or *preparatory and propositional content conditions*. The speaker makes the utterance under the assumption that the presuppositions hold true. The hearer can refuse an update if she feels that presuppositions are violated. Else, she will update her belief state, and both hearer and speaker (plus possibly other interlocutors) will update the common ground accordingly. Hence, the social agreement has come about.

After the update, many performative sentences denote sets of worlds which fall into homogeneous subclasses, depending on the addressees next reactions. The anticipated reactions can be few and simple, like *accept—refute*. They can also be more diverse and contribute further specifications to the courses of future worlds that are included in the proposition.

As a consequence, we can solve the puzzle whether utterances that require a response in order to lead to specific obligations for speaker and addressee should count as directive (to answer) or whatever else (the eventual agreement is about):

- Social agreements denote sets of worlds which specify future courses of worlds, and entail who will be interested in pushing matters towards one or the other type of future.
- These future courses can include future immediate reactions of the addressee as well as long-term plans of the addressee (and speaker). This does not constitute a paradox or classification problem.
- The old triade of *directive—commissive—declarative* reflects the observation that future plans can involve actions of the speaker, actions of the hearer, and general commitments of society as a whole as to how to go about.
- It is not true, though, that all utterances that count as a speech act must be pure directives, pure commissives, or pure declaratives. For example, in our terms, a declarative is a mix of commitments for several parties and hence should qualify as a *pure mix*?

Most importantly, the proposed account explains how something that interlocutors do after every turn in dialogue—they negotiate

and perform an update of their common ground—is also what happens when they exchange explicit performative statements. The link between mutual joint beliefs and social facts is at the core of the proposal. Simple as it may look, it offers that little *snag* between understanding S and social fact ϕ that we found missing in earlier accounts in part I.

One attractive aspect of the analysis consists in the fact that we have an integrated semantic/pragmatic analysis of sentence content and speech act. We explored this integrated account in our investigation of tense and aspects in performative utterances. Within an integrated analysis, the temporal indexical of a performative utterance turns out to be the normal temporal indexical (R/S) of any sentence and hence does not require an extra treatment. The integrated analysis also allows us to better understand why progressive aspect is unacceptable in performative utterances, which led to our generalization on reference time for performative utterances:

Let u be an actual utterance with real duration $\tau(u)$. Being an utterance, u has also a reference time R_u . For any social agreement ϕ : $R_u \subset \tau(u) \rightarrow \neg\phi(u)$.

We can think of many more phenomena that can be reconsidered in an integrated semantic analysis of performative utterances, like particle use, embeddability under logical connectors, polarity sensitive expressions in performatives (other than questions), and more.

The approach that we presented here draws substantially on a similar proposal by Truckenbrodt, 2009. Truckenbrodt is the first, to our knowledge, to spell out the notion of social agreement in terms of mutual common beliefs. This link is absolutely crucial in that it offers a possibility to formulate social acts as part of a theory of information change and information update. We diverge from Truckenbrodt 2009 mainly in that we propose a direct entailment from common belief to fact. Truckenbrodt's analysis rests on the assumption that all performative sentences are lexically equivalent to a paraphrase in terms of mutually joined beliefs. We have argued that such paraphrases are both logically too strong and often also implausible, and that a direct entailment approach is more flexible, feasible and general. We moreover extended Truckenbrodt in integrating more semantic phenomena, notably aspect, into the analysis.

We systematically left out imperatives and questions. In some sense, we believe that the proposed general framework is broad enough to be extended to cases where the syntax of a sentence is the strongest clue to its illocutionary point. Yet, sentences in the imperative mood and question mood do not make it as easy as

explicit performatives to “read off” the propositional content of the social agreement from the sentence. In part I, we pointed out that the most robust semantic modelling for imperative mood and question mood derives a speech act neutral propositional content in a first step. Only after that should we specify any illocutionary content, i.e. some kind of social agreement that is defined in terms of that propositional content.

In the part on imperatives, we will review the existing literature on recent proposals that go in this direction.