Achieving intersubjectivity in Augmented and Alternative Communication (AAC): Intercorporeal, embodied and disembodied practices

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Abstract

In this chapter we investigate communication which includes the use of computer-based speech aids by people with severe cerebral palsy (Augmented and Alternative Communication, AAC). The reduced bodily capacities and the 'uncontrolled bodies' of the participants suffering from CP make bodily synchronization with their partners a considerable challenge. What is more, the electronic speech aid not only produces a disembodied language (synthetic speech), but also has a massive impact on the mutual corporeal attunement of the participants. It slows down the production of turns to such a degree that sequential structure – and hence also mutual understanding – are in danger of being destroyed, and it brings about the Augmented/Alternative Communicator's withdrawal from the ongoing focused interaction. It will be shown that these detrimental effects of AAC can lead to a breakdown in temporal, sequential and topical structure, and to interactional failure and lack of understanding. However, we will also be shown that there are ways to overcome these risks. On the one hand, the negative impact of the 'talking machine' can be minimized when the user reduces the time needed to output speech by refraining from putting together complex utterances; this strategy requires co-participants' willingness and competence to integrate the machine-produced semantic hint into a sequence of 'post-processing'. Another way of meeting the challenges and risks of a 'talking machine' is a 'moderator' who channels and controls co-

participants' activities despite the Augmented / Alternative Communicator's focus on the machine, even during the production of a complex utterance. In both ways, the machine can be 'embodied', and the interaction can – despite CP – become an 'intercorporeal' one.

Introduction

Fuchs & De Jaegher (2009)—as well as the editors of this volume in their introduction—outline an approach to intersubjectivity which takes us away from what they call cognitive modeling – the assumption that successful communication relies on each individual participant's construction of a mental model of the co-participant on the basis of which which inferences about the intended meaning of co-participant's utterances can be calculated - and which foregrounds the role of intercorporeal practices ("mutual incorporation"). This paper focuses on interaction including participants who, as an effect of a severe cerebral palsy, are unable to control the movements of their body sufficiently, which includes the movements of the speech articulators. They use electronic speech output systems instead (so-called Augmented and Alternative Communication, AAC). Both due to the nature of cerebral palsy and due to the specific constraints induced by computer-aided communication of this type, many prerequisites for "mutual incorporation" seem to be lacking, among which Fuchs & De Jaegher (2009: 466) mention in particular "bodily resonance, affect attunement, coordination of gestures, facial and vocal expression". Instead, a highly disembodied practice (synthesized speech composed on a computer screen) takes over. Communication with people suffering from cerebral palsy therefore puts theories of intercorporeality to a severe test: since the body is (at

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least to a certain degree) excluded from sense-making practices, is intersubjectivity impossible in this case? Or, if it is possible (as it appears), would this very fact not prove that cognitive models of sense-making, as they dominate linguistics, are by far superior, if not uniquely adequate, to account for human understanding since they can easily handle such a challenge?

In the following we will show that cognitive processes of referential meaning-processing, are indeed part and parcel of linguistic communication and that their absence makes it difficult and sometimes impossible to establish reference and predication. However, we will also show that speakers with cerebral palsy who dispose of a speech-output machine prefer bodily to machine-based communication wherever it is possible. They engage in a coordinated intercorporeal exchange, restricted as it may be, if this exchange has the slightest chance of being successful and leading to intersubjectivity. Machine-based communication is only used to the degree that it is indispensible for referring and predicating. We will argue that "cognitive" and "intercorporeal" practices of sense-making should not be opposed but that it is more adequate to look at their interplay. Augmented/Alternative Communicators can lean to the extreme of purely "cognitive" practices, or to that of purely "intercorporeal" ones, but most often (and most fruitfully) they combine both.

Augmented and Alternative Communication with people suffering from Cerebral Palsy

People suffering from severe infantile (i.e., non-acquired) Cerebral Palsy (CP) have to deal with physical constraints that impose severe restrictions on their voluntary movements (see Miller 2005). CP affects the speech articulators and

therefore leads to anarthria, i.e. it makes speech impossible. Only non-linguistic vocalizations (of various complexity and often with functionally used prosodic variation) remain. CP also affects the movements of limbs and head, particularly when fine-grained controlling and timing is required, as is the case for many types of bodily communication. In particular, most iconic gestures are impossible, al though pointing gestures are usually possible even though imprecise; head gestures such as nodding or shaking one's head are intact, but it may take some training by the co-participant to distinguish voluntary from involuntary movements. Facial expression is also more or less intact. All movements of the body can be distorted by spasms, and body movement appears again and again out of rhythm and lacking smoothness. The expressive functions of the body are therefore reduced to gaze, non-iconic gestures, mimics and vocalizations/prosody, i.e. to non-symbolic (non-conventionalized) semiotic resources. Some people suffering from CP have additionally developed limited repertoires of 'body signs' with conventionalized, more or less fixed meanings among them and their most intimate communication partners (such as gaze toward the chest of the co-participant meaning 'you'; see examples below).

For a long time, people with CP have used communication aids such as pictogram boards, or, more recently, electronic devices; among the latter, speech output systems based on speech synthesis are most relevant. The term "Augmentative and Alternative Communication (AAC)" refers to communication with the help of any of these resources (Beukelmann/Mirenda eds. 2012; Norén et al. 2013). Electronic communication aids of the most advanced kind, as they are used by the Augmented/Alternative Communicators of this paper, provide an extensive vocabulary of pictograms identified for the words of a language,

sometimes also for letters and fixed phrases. If fully exploited, the machine is able to replace a good deal of the missing speech. The hardware is similar to laptop computers and mounted to the wheelchair. The complex system of pictograms, structured in multiple hierarchies, can be accessed by special keyboards, by means of gaze (eye tracking) or by headbangs to the right or left against the headrest. The software aims at making the production of full-fledged sentences conforming to written standards possible. In addition to hundreds of lexical items (the selection of which can be programmed specifically to the needs of the individual user), it provides grammatical words and sometimes automatically completes the input by adding grammatical elements (such as for morphological agreement). The single-item pictograms assembled by the user appear in a separate window on the screen and can either be sent to the synthesizer once s/he has decided that the utterance is complete, or they are 'spoken' by the machine one symbol at a time, which enables the recipient to observe the composition process online even without looking at the screen. As the composition process often requires several steps of hierarchical search, and as many users cannot always control their gaze, arms or head with precision and therefore make mistakes, it often takes minutes before a multi-word utterance is put together. Particularly when the machine is set such as to output speech only when the sentence is completely assembled and sent to the synthesizer by the user, long silences regularly occur before or in the Augmented/Alternative Communicator's turn.

Despite the enormous hopes and expectations raised by the producers of AAC devices among parents and relatives that their machines would 'normalize' the communicative life of those who suffer from cerebral palsy, research on how

speech output machines are used (including our own) shows that these hopes for and expectations of 'normality' are usually not fulfilled. In spite of the possibility inherent in high-end electronic devices to produce a huge number of grammatically well-formed, complex sentences, electronic communication aids are used less frequently in everyday interaction than bodily resources such as eye gaze, head movements and vocalization; research has also shown that their technical possibilities are not exhausted by far by most users (cf. Light et al. 1985 a, b, c, Culp et al. 1986, Jollef et al. 1992, Braun 1994, Clarke & Kirton 2003, Pennington & McConachie 1999, Hörmeyer 2014). In our data, too, multi-word utterances are the exception rather than the rule (unless explicitly insisted on by a norm-oriented co-participant, such as a teacher), and often Augmented/Alternative Communicators restrict themselves to single-word utterances whose meaning cannot be established without interactional 'post-processing'. But most importantly, the use of communication aids by no means results in a 'normalization' of communication (as we shall see below, also cf. Engelke 2013). It can facilitate reference and predication in many important ways, but it also has severe consequences for face-to-face interaction that make it deviate from 'normal' conversation. It is for this reason that people with Cerebral Palsy restrict their employment to the necessary minimum: as Hörmeyer (2014) shows, a maxim of *using the machine as much as necessary, but as little as possible*, is in operation. This means that whenever alternatives to sense-making are available, machine-based communication is the dispreferred option, although this option is massively propagated by teachers and care-takers, and partly also by parents. Instead, Augmented/Alternative Communicators make use of all the bodily resources that are available to them. And even when resorting to the

communication aid, they refrain from producing self-contained, full-fledged sentences but rely on collaboration with their co-participants, which is necessary when ambiguous or/and underspecified one-word utterances are produced electronically. The ensuing hint-and-guess-strategies are well known from interactions with people suffering from aphasia (Bauer & Auer 2009). In these often complex 'post-processings', participants rely on interaction instead of a speech output machine in order to compensate for their lack of speech. They resort to their co-participants as a communicative resource (Bloch 2005, Bloch & Beeke 2008, Clarke, Bloch & Wilkinson 2013, Clarke & Wilkinson 2009, Goodwin 1995, 2008, Hörmeyer & Renner 2013, Sigurd Pilesjö & Rasmussen 2011). The responsibility for establishing intersubjectivity is then not with the speaker alone, but it is shared among all participants; in fact, the lion's share is often taken over by the speaking participants. One important generalization is therefore that CP-participants do indeed 'augment' communication, but not always and not preferentially by using a speech output system run on a computer, but by relying on their co-participants' collaborative practices. This is true despite the fact that the computer at least in theory provides the full array of referential resources that are necessary to perform as an autonomous speaker, a status held in high esteem in western societies.

The augmented communicators who will figure in the examples discussed below are

- Regina, a 23-year-old woman, who lives in a home for physically challenged people. Regina's communication aid is an Eco-Talker equipped with Minspeak 144 software for iconic coding. Regina operates her

communication aid by a scanning technique; the scanning buttons are in the headrest of her wheelchair, i.e. they react to left and right bangs of the head.

- Max, a 17-year-old young man, who lives with his parents and attends a school for physically challenged children and youngsters. Max uses a Tobii C12 electronic communication aid with eye tracking input. The communication aid includes a grid-based dynamic user interface with a letter based coding program LiterAACy.

- Nina, a 19-year-old woman, who lives alone with the help of personal assistants who are present around the clock. Nina uses a MyTobii P10 1 electronic communication aid with eye tracking input. The communication aid includes a grid-based dynamic user interface with iconic coding SonoLexis 2.[89]

"Mutual incorporation" vs. "cognitive" models of achieving intersubjectivity

Fuchs & De Jaegher (2009) have criticized current theories of intersubjectivity for being too "cognitive"; i.e., these theories explain understanding as the outcome of processes of simulation, inferencing and mental model-building. In essence, cognitive models start from the assumption that communicators have internal models of the other on the basis of which their behavior can be interpreted and even predicted. Mutual understanding is not so much an interpersonal achievement, but rather an internal process in the individual who

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[89] For more details on these and other Augmented/Alternative Communicators and their individual styles see Hörmeyer (2014).

matches the other's observed behavior with the mental model (cf. "theory of mind"). Building these models requires experience, perhaps also empathy (the ability to switch perspective). The details of the interactional event are less important.

Fuchs & De Jaegher argue that such a view assumes "a disembodied sender-receiver relation between two Cartesian minds" in which the body only functions as a "transmission device" (2009: 468). Their counter-proposal denies the relevance of cognitive representation and relies entirely on the "moment-to-moment interaction of two subjects" (466). Of course such a theory is not entirely new but echoes many central insights of ethnomethodology and conversation analysis, which share with Fuchs & De Jaegher's "dynamical agentive systems" an interest in the sequential, dialogical unfolding of interaction which they regard as the locus in which meaning emerges – between, not within the participants. Garfinkel's notion of reflexivity (1967) is very similar to Fuchs & De Jaegher's claim that actions are to be regarded "as exhibiting an inherent and 'visible' intentionality" (2009:467). Work in Conversation Analysis over the last decades has demonstrated that human intentions are neither given nor completely hidden but emerge in and through interaction. It has also shown empirically how the joint attribution of intentions to behaviour is achieved. (Needless to say, in other fields of pragmatics different, more individualistic models of sense-making prevail.) Therefore, it is no news to CA practitioners that "meaning is co-created in a way not necessarily attributable to either of the interaction partners" (Fuchs & De Jaegher 2009: 477); CA-inspired work on interaction under difficult conditions (such as aphasia – cf. Goodwin 1995, Bauer / Auer 2009, etc. – or CP, see below) perhaps makes this co-creation even

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more obvious. Even Fuchs & De Jaegher's insistence in the fine-grained details of bodily (and linguistic) practices (including gesture, facial expression, etc.) is shared by CA through its recent multi-modal turn.

But Fuchs & De Jaegher also go beyond CA. They do so first of all by assuming that inter-personal attunement "coordinates meaning" (as they put it) directly, i.e. without mental representations.[90] They further claim that the "lived bodies" (*Leiber*) of the interactants mutually incorporate each other to enter a "dyadic bodily state" (472), building on the phenomenological insight that the limits of the *Leib* are not the limits of the *Körper*. Rather, humans (and certain animals) can manipulate objects as extensions of their lived body, for which Merleau-Ponty (1962: 143) gives the example of the blind man's stick. In the same way in which the human actor incorporates instruments, s/he may also incorporate the environment in which the body moves, i.e. the shape and nature of the things among which the body has to orient itself to in order to move successfully.[91] Taking this idea of incorporation even further, Fuchs & De Jaegher

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[90] They insert an "explicit" before "representation" (p. 471), but it is unclear what "explicit" refers to in this context. If it is equated with "conscious", their claim is trivial since few theorists would claim that any action must be linked to a conscious intention. In fact, the separation of mental representation and consciousness is one of the big inventions of 19th century psychology.

[91] It may be commented in passing that it is difficult to see how this "incorporation" can proceed without a mental model of the spatial configuration in which the body moves. Any simple route description is evidence for the fact

argue that interpersonal coordination leads to "mutual incorporation" of the lived bodies, and from there to direct (non-representational) intersubjectivity; just as a walking cane, interactional gaze, for instance, is an extension of the body.

The theory, although framed in general terms, clearly aims at explaining bodily communication from which language is absent. (Very) early (i.e. largely pre-linguistic) parent/infant interaction is therefore their most convincing example (hence its extensive treatment in their work, see 2009: 478-482). But there can be little doubt that a model that wants to expel mental representations entirely from sense-making practices must fail once a single word is involved. This follows from the very simple fact that a language has to be learnt and its elements therefore mentally stored. The way in which mental representations of language are 'put to' action (and how they emerge from practices) is a matter of much debate in linguistics, but even the most non-nativist, usage-based theories of language would concede that linguistic actions have recourse to (similar) prior experiences of the speaker, and rely on the speaker's tacit assumption that at least a good deal of these experiences are sufficiently similar to those made by the co-participant. Therefore, if the cognitive and the embodied part of communication can be separated or opposed to each other at all (which we would question), the very existence of linguistic symbols as stored and remembered form/meaning pairs already excludes the possibility of intersubjectivity without cognition (in the sense of mental representation of linguistic forms based on entrenched, i.e. repetitive experience; cf. Bybee 2010).

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that people dispose of such mental representations which they can transform into language (or drawings), however inaccurately.

In addition, there is ample evidence that language comprehension essentially and extensively requires processes of inferencing which bridge the gap between what is said and what is meant. Sense-making only can take place in context, and there is no way of linking mentally stored linguistic items (words, or chunks of words to contextually embedded, intersubjective meanings without inferencing, i.e. cognition.

Having said this it has to be added immediately that sense-making in face-to-face episodes only rarely means putting together linguistic symbols according to the rules of grammar in the same way in which this can be done in writing. First of all, speech means the use of the body (articulators, larynx, lungs,...), which impacts on how linguistic symbols are contextualized (voice quality, etc.). Furthermore, speakers do not simply speak, but usually their speech is embedded in a multitude of simultaneous or neighboring nonverbal, bodily practices, from gaze and body shifts over laughing and frowning to gesturing and facial practices. The most intricate and unavoidable link between language and the body is deixis, the indexical practice par excellence (cf. Stukenbrock 2015). These embodied aspects of language have long been forgotten, not least because linguistics originated from philology, the art of interpreting written texts, particularly coming from long-extinct languages. As Voloshinov once put it (1923[1973]), linguistics emerged over the corpses of dead languages (and hence tended to be 'disembodied'!). Equally important is another point: the production of a linguistic utterance in face-to-face interaction does not take place in a vacuum, but rather resonates with the immediately prior utterances. Often, this resonance is non-functional, unconscious, and indeed non-representational. Words and constructions, even prosodic gestalts and sounds, are mirrored in a

next utterance from what was said before, and the construction of the present utterance often builds on the previous one even in its syntactic makeup (analepsis).

Despite these arguments for treating language as embodied action in face-to-face interaction (which arguably is the primordial locus of intersubjectivity), the fact remains that humankind has invented a highly efficient and hugely influential technique of separating linguistic communication from the body, i.e. writing. What remains of language once it is written is its ability to convey a detemporalized propositional meaning. It is exactly this type of language which is provided by AAC speech-output machines.

Embodiment and mutual incorporation in AAC

The tension in AAC between bodily practices to establish intersubjectivity on the one hand and disembodied, machine-generated practices on the other seems radical and extreme. Yet it is premature to equate the first with Fuchs & De Jaegher's "mutual incorporation" and the second with "cognitively" mediated, (written) linguistic interaction. In the first case, the problem is that for CP interactants, the amount of resonance and synchronization they can produce with their bodies is limited by their palsy, and since not a small amount of their body movements are involuntary derailments, non-CP co-participants will often disregard these 'ill-behaved' bodies voluntarily or involuntarily. In the second case, the process of encoding a message into the computer is a visible and sometimes highly conspicuous bodily process for a person with cerebral palsy. Making the machine speak for oneself through selecting visual symbols associated with words visibly requires a physical effort. It is only the synthesized

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output that is disembodied, but the process behind its production is not. (Merleau-Ponty 1962: 145 mentions the incorporation of the key-board by the type-writer, which is very similar to the incorporation of the screen by the AAC user through his/her eye movements.) As we shall see below, some co-participants co-engage in this process, so that the composition of the input for the speech synthesizer is not the monological process we know from modern writing practices, but can show signs of mutual incorporation of all co-participants and the computer. In addition, again different from canonical written communication, the output of the machine is usually not sufficient to establish intersubjectivity; what the machine says often rather requires co-participants' effort to establish intersubjectivity, not in the least through dialogical, intercorporeal practices. Hence, although the speech aid produces a speech output that is disconnected from the body of its author, its transformation into a meaningful utterance is a deeply interactive process which builds on coordination and cooperation between the participants.

We will start the empirical part of our contribution by a discussion of an extract in which a CP participant is forced to use the machine, and in which AAC has indeed a highly disembodying effect, entailing loss of temporal and sequential synchronization, but also marginalization and loss of intersubjectivity. The example therefore represents the extreme opposite of "mutual incorporation". We will then discuss an intermediate example in which the partners of an Augmented/Alternative Communicator follow different preferences with regard to speaker autonomy and monological speakership on the one hand, and dialogical meaning-construction on the other; but even though the co-participant who favors autonomy and computer-based communication

which comes close to the written norm seems to 'win' with her preference, working with the computer becomes a common project in which all participants join in both through "cognitive" and "intercorporeal" practices. Our final example comes from an augmented communicator who has developed a skillful way of combining machine-produced language and bodily resources to enter into a process of joint meaning-production with her co-participants. The example shows that a fruitful fusion between machine and body communication can be achieved.

The negative impact of the machine: asynchrony, sequential disorder and lacking intersubjectivity (Example 1)

Conversations with people using AAC devices proceed much more slowly than conversations between speaking people (Clarke & Wilkinson 2010, Higginbotham & Wilkins 1999, Engelke 2013). This is due to the simple fact that the process of putting together an utterance on the computer (even if it consists of one word only) is extremely time-consuming. This fact can create substantial problems for the sequential organization of the interaction.

Here is an exemplary extract from a conversation between the Augmented/Alternative Communicator Regina (to the right in the picture below), Regina's caregiver-assistant Linda (not visible in the recording but sitting opposite Regina at the other end of the table), Frau Müller, who is the representative of the company that sold Regina's communication aid and still provides technical support for it (sitting opposite the camera), and Hannah, an AC-therapist (to Mrs. Müller's right). They are in a meeting to discuss various technical problems with Regina's 'Talker'. The transcript sets in at a point where

Frau Müller has the turn; she is about to list the topics of previous meetings, partly reading from her notes which she has spread out in front of her on the table. The primary addressee is Linda, who is Regina's new assistant and who needs to know this background.

In this extract Regina produces a four-word utterance with the help of her communication aid. For better readability, the transcript is split up into two parallel columns, the right-hand one showing Regina's verbal and non-verbal activities. Line initial letters mark eye communication (-e), gesture (-g) and the electronic speech output (-s). Regina's "Talker" is set such that every word she selects is read out by the synthesizer immediately.

Extr. (1) Television (Regina_06.11.12_1, 18:52-21:01)

01	Mü : dann: haben wir uns: da: auch noch äh über: (0.3) infrarotFERNbedienung, then we also uhm [talked] about uhm (0.3) the infra-red remote control		
		02	<<high, p>hm::::;>
03	Über die; pau; äh die:; about the pau uhm the		

04	[ACH dann kam wieder die BLUEtoothtaste auf; oh and then the bluetooth button came up again,		
		05	-e: [*looks at Talker*
		06	*starts to operate it with massive horizontal head bangs; these intentional movements are accompanied by non-intentional movements of the arms (continues until line 69)*
07	(0.5)		
08	erNEUT; again,		
09	(0.6)		
10	ham wir AUSprobiert; we gave it a chance;		
11	(0.8)		
12	UND, and,		
13	(0.7)		
14	der DAUerbrenner, the perennial,		
15	KAbelprobleme; problems with connecting cables;		
16	Li : hi hi		
17	(0.5)		
18	Ha : hn he he		
19	Mü : JA. yes.		
20	(0.5)		
21	ach dann hatten wir noch ein !DREI! meter KAbel; oh then we had a three meter cable		
23	(0.6)		
		22	*((coughs))*

24	was is_n DAraus geworden; what came out of that;		
25	-e: *looks at Hannah*		
26	Ha : <<p>ähm:: DAS:>> uhm:: it:		
27	Mü : *((snorting with laughter in an artificial way))*		
28	Ha : *((laughs))*		
29	-e: *looks at Regina*		
30	[regina isch des zu[RÜCK oder- (.) regina has it been sent back or-	31	-e: [*looks at Hannah*

32	Mü-g: [*puts both hands before her eyes in
	        a playfully exagggerated gesture of
	        dispair*		

33	Mü-e: *looks at Regina;from now on until
	        line 45 she leans back and keeps
	        her arms folded in front of her
	        chest*		

34	Ha : isch des zurück als wir den Eco
	        eingeschickt haben;
	        was it sent back when we sent in
	the talker;		

		35 36 37 38 39	-e: *looks up* (1.0) -e: *looks at Hannah* -g: *nods three times* -e: *looks at Talker*
40	Ha : ich glaub (.) AUCH; I think so too;		
41	(0.7)		

		42
		43
			-s: **ich habe;**
			    I have
			    (1.9)

44	Ha : <<p>ah sie_s noch (-) grade DRAN.>> ah she is still ( )ing;		
45	Mü : °hhhhh;		
46	-e: *looks at papers*		

47	also das DREI meter [kabel hab_ich
	        LETZtes jahr mitgebracht,
	        so the three meter cable I brought
	last year		

48	Ha-e: [*looks at*		

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		papers		
49		genau das haben WIR doch, right we sent it		
50		bei dem ges (.) SPRÄCH wo der herr KELlermeister da war, the mee (.) ting when Mister Kellermeister was here,		
51		danach haben wir doch [den Eco eingeschickt;= after that we sent the talker in		
52		=WEI::L? (-) because,		
53	Mü :	[A_a; I see		
54	Ha :	[°h die: die: (.) [(xxx xxx xxx) kaputt war; the the (xxx xxx xxx) was broken,	55	-s: **[FERNseher. television**
56	Ha :	wo die:: KAbel reinkommen, where you can put the:: cable in,		
57		°h und ich glaub da haben wir das glei mit zu[RÜCKgeschickt, and I think we also sent it back then,	58	[öhm
59	Ha :	weil das KEIne opti, because it (was) not an opti(on),		
60		ALso: I mean		
61		weil wir gesagt haben NEE; because we said no;		
62		isch NIT die [beste lösung. It's not the best solution.		
63	Mü :	[((sighs))		
65		also im: noVEMber letzten [jahres steht hier noch- so november last year it says here-	64	[ahm.
66	Mü :	drei meter kabel hab ich geGEben, I gave (you) the three meter cable,		
67		aber es ist NICHT probiert worden, but it was not tested,		
68				

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    Ha  : nee
          no
                                          69  -s: TALker.
                                                 talker
70  Mü  : und dann haben wir (.) den LETZten
          termin;
          and then we had our last
appointment;
71
          (0.4)
72
     -e  looks shortly at R.
73
          wo ich dich geSEHen hab=
          when I saw you ((->R.))
74
          =war am: (0.6) dreiundzwandzigsten
          JU: LI:,
          it was (0.6) july twenty third,
75
76        (0.4)
          da war dieser herr KELler:::
          [mann,
          there was this mister keller:::mann
77
    Ha  : [MEIster;
78
    Mü  : MEISter da,
          meister there
79
80  (0.7)
          haben erNEUT bluetoothtaste
          ausprobiert;
          we tested the bluetooth button
81  again;

          und dann stand (0.4) option für
82        HERBST.
          and then it said option for autumn.
83
          [und da: WA:R schon-
84         and there it was already,

    -e:       [ looks at R.
85
          (1.0)
86
          wUrde MIR gesAgt,
          I was told,
87
          das war offensichtlich ja schon
          LÄNger entWICKlungsprozess=
          obviously that had been a
88        development for some time

          =ähm vielleicht [der UMzug.
89        uhm perhaps a relocation
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90   Mü-e:                    [looks at Linda

91   Li  : hm_[m,

92   Mü  :   [und dann wurde [WIEder jetzt

       -e:                    [large horizontal
93        termination gesture with both arms

         [erst mal (.)
94         and then now it was again (.) pfr-

         -e:    [vertical gesture with both
95   hands:
          Rest
96   Mü:   [pf.
97
       -e: [repetition of termination gesture

98       [SO.
          Ok.

99     -e: [repetition of rest gesture

         <<mocking> ↑JETZT
         ↓trEffen wir uns [heute-
100      now we are meeting today.

       -e:                    [looks at Regina
101
         °hh ich möcht jetzt aber gerne
         WISsen-=
102      now I want to know

         =du has [grad noch was
103      geSCHRIE:ben:-=
         you wrote something just now:

                 [((gets up, walks towards
104      Regina, looks at Talker))

         =schwester hab ich verSTANden,=
105      'sister' I understood,

         <<p>was (xxx);>
106      what (       )

         <<p>das LETZte da wollt ich noch
         was zu SAgen,
107      I wanted to say something to the
     last point-

108      AH;
         I see;
```
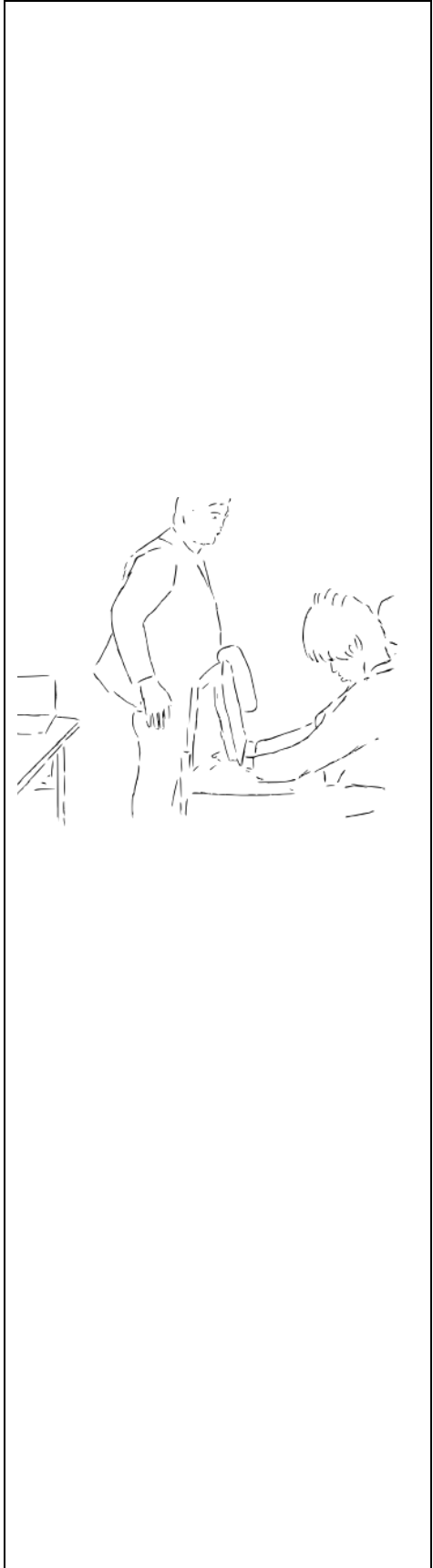
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109
        mit_m [FERNseher;
110     about television;

111           [((sits down again))

        (0.3)
112
Ha  : ja,
        yes
113
Mü  : was war mit dem [FERNseher;
        what about the television;

114 Ha  :                  [alles GUT,
                             all good,

        wir haben_s [(-)] HIER (.) ohne
115     probleme installieren können=
        we were able to install it here
without any
                  problems

Mü  :               [ja]
                     yes
```

It is a notorious problem of Augmented/Alternative Communicators that in order to take the turn when they are not designated next speakers, they would have to come in exactly at, or even before, the possible completion point of the previous speaker. In ordinary, non-augmented communication, one possibility speakers resort to in order to claim the turn in such a first-starter-comes-first context (cf. Sacks, Schegloff & Jefferson 1974) is to start the production of a next utterance at all costs, even if this utterance is not yet planned and may require recycling and repair once the turn has been secured. For an Augmented/Alternative Communicator, starting to produce a next utterance is tantamount to looking at the computer screen where its elements must be composed. However, focusing on another person or object outside the established interactional constellation runs the risk of being interpreted as a

withdrawal from this interactional encounter, i.e. the opposite of claiming the turn. Only experienced, attentive and good-willed co-participants will understand such a cue. Regina does look at the computer in line 05, as an attempt to take the turn, but nobody seems to notice.

For non-CP speakers, one way of getting the turn early is the production of a semantically and syntactically non-committal pre-starter., These pre-starters (Sacks, Schegloff & Jefferson 1974: 719) are usually words (discourse markers, interjections, adverbs). But since it takes them such a long time to produce even a single-word utterance with the machine, this is not an option for CP participants. Their only alternative is vocalization at the earliest possible moment, i.e. they must use their body to communicate. But when Regina wants to join the conversation in line 02 and signals this through a high-pitched, but relatively soft *hm:::*, this attempt is completely disregarded by the others, although it is positioned at a reasonably good moment in sequential time.[92] The beginning of Regina's utterance production is thereby made irrelevant and inconsequential for/in the interaction.

While Frau Müller, Hannah and Linda now engage in talk about various technical problems around the Talker, Regina from line 01 on pursues her own project, i.e. that of providing a relevant contribution to the first topic brought up by Mrs. Müller, the infra-red remote control which can be used to watch TV on

---

[92] The proper sequential position to contribute to this topic is right after Frau Müller's line 01, although her sentence is fragmentary (the projected infinitival verb in the terminal sentence bracket position, i.e. after *infrarotFERNbedienung*, is lacking) and therefore does not provide an ideal turn-transition possibility.

the computer. Since she uses a system in which the selection of items on the screen is done through vertical head bangs against the left and right part of the head-rest, the putting together of the utterance is accompanied by massive movements of the head, some of them quite noisy. In addition, Regina's mostly voluntary head-movements are accompanied by involuntary arm movements, which make her whole body look highly agitated. Despite all these cues, the co-participants ignore the ongoing formulation process. Regina's engagement with the computer is treated as an event outside the developing interaction. The joint focus of the interaction (topical talk about technical problems) does not include Regina, although the very reason for which she keeps looking at the computer screen is of course her intention to contribute to it. Intersubjectivity fails not because the wrong words are chosen or because of an incomplete utterance; it fails on the intercorporeal level, where participants misunderstand (or choose to misunderstand) the Augmented/Alternative Communicator's intention to take a turn. Note that Regina's movements, voluntary or involuntary, as well as the enormous strain visible in her face when she works on the computer, are not what Goffman (1963) would call decent behavior in interaction. Rather than with "attunement", co-participants may be reacting with civic disattention to it, as lay persons might do (although they are all trained in AAC and are well familiar with CP persons).

While Regina is busy with her computer, Frau Müller brings up the issues to be discussed chronologically (*infrared remote control* l. 01, *bluetooth button* l. 04, *problems with connecting cables* l. 15). When Frau Müller asks about the whereabouts of the three-meter cable (l. 21), it is Hannah who answers, but she also includes Regina in a subordinated question/answer sequence (*regina has it*

been sent back or-, l. 30, is addressed explicitly to her, and accompanied by gaze at the addressee). Regina is briefly reintegrated into the interactional constellation; she has to answer Hannah's question while she is still working on her next utterance on the machine. She deals with this double task by briefly looking away from the computer screen and by nodding several times (l. 34-38). Her bodily resources to communicate (nodding) are separated from her linguistic-symbolic ones (speaking with the help of a written message on the computer), and while the first deals with the subordinated activity of answering Hannah's question, the second is devoted to the main activity of putting together a linguistic message.

It is only now (at line 41, about 40 seconds after she has started to work on the computer) that Regina has the speech synthesizer produce the firsts two words of her intended utterance: *ich habe* 'I have', a sentence beginning which clearly projects more to come. This leads to Hannah's metacomment in line 43 (presumably: 'she is still working'). However, instead of paying attention to the ongoing speech production by Regina at least now, Frau Müller re-instantiates the cable topic. Hannah explains more explicitly when and why the connecting cable was sent back (l. 46 and 48-61). After that, Frau Müller brings up the topic of the *bluetooth button* again. In the meantime, Regina's 'Talker' has produced the next two components of her contribution (*Fernseher* 'television' in line 54 and *Talker* in line 68). Both remain unresponded to as does the utterance as a whole, which can now be heard as *Ich habe Fernseher Talker*. The intended meaning is presumably a news-telling: Regina wants to let Frau Müller know that she can now remote-control the TV on her Talker. All in all, it has taken her more than a minute to produce these four words. But even after the full sentence has been

uttered by the machine, the other participants do not respond to it. Rather, they continue their conversation, from which Regina is excluded, for roughly 50 more seconds – an extraordinarily long lapse after a news telling.[93] Of course, the ongoing conversation between the other participants has at that point already reached a very different topical and sequential state.

Only after she has worked through her topical agenda does Frau Müller react to Regina (*you wrote something* l. 92-93). In retrospect, she makes it clear that she has noticed Regina using the machine to 'say something', but equally, that she was not attentive and did not understand what it was (cf. her '*sister' I understood* l. 95). But here writing comes in: a speech output system such as the one Regina uses is based on written language. In order to produce her sentence, Regina had to assemble it *in writing* on the screen, where it remains unless the user deletes it.

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[93] Another problem with AAC is that not only the beginning but also the end of an utterance may be ambiguous. Full grammatical sentences which display syntactic completion are rare anyway. The most widespread way to signal turn-completion for Augmented/Alternative Communicators is gaze (Hörmeyer 2012). Just as a visual focus on the screen signals the beginning of the production process, looking away from it and gazing again at the recipient(s) is a signal for its termination. In our case, Regina remains in the bodily position she has assumed during the utterance production even after the production of the utterance *Ich habe Fernseher Talker*, i.e. she is focused on the computer screen and also actively searches it (although this is not visible for the other participants). It is therefore possible that she wants to expand the utterance. The others receive no bodily signal from her that her turn is complete.

There is no decay in such an utterance, as is typical of spoken language. So Frau Müller has an easy way to rewind the clock: what Regina said is not lost but still available on the screen, although the sequential position in which it would have been an adequate next activity has long gone. Sequential disattention and sequential inappropriateness can be repaired by looking at the written word. Frau Müller gets up, goes to Regina, looks her over the shoulder and reads what Regina wrote (l. 94). She treats her contribution as an a-temporal object not dependent on a sequential position in which it uniquely fits and becomes meaningful. She picks out one word of the utterance (*I see, about the television* l. 99), sits down again and establishes Regina's turn as the new conversational topic (*what was with the television* l. 102) – without grasping its full meaning. Hannah begins to 'speak for' (Bauer 2009) Regina (*all good, we were able to install it here without any problems* l. 104-105). Regina does not respond, i.e. she neither confirms nor disconfirms this re-formulation of her contribution.

In sum, the first extract demonstrates enormous problems among participants to establish intersubjectivity; this is due to the temporal delay in providing a topically adequate next utterance which also leads to sequential problems, but also because the long utterance composition process, during which Regina withdraws from the interaction and keeps looking at her computer screen, whichexcludes her from the interaction among the other participants. Although Regina manages to make her machine utter an interpretable multi-word utterance, this process lacks attunement and synchrony. Producing the utterance is a bodily activity for herself, but all intercorporeal links with the others are severed.

Autonomy vs dialogicity in AAC (Example 2)

Our first example has shown how the use of an electronic communication aid can make "mutual incorporation" impossible or at least greatly reduce it. By withdrawing from the ongoing interaction in order to produce a more or less complex utterance with the help of the machine, the Augmentated/Alternative Communicator cannot sustain bodily synchronization – unless supported by participants who invest in this project. The second example shows how co-participants in interaction with a CP speaker who uses a speech output system can pursue different interactional strategies to achieve intersubjectivity. They all invest in this project and turn it into an intercorporeal one. The extract is taken from a conversation between the Augmented/Alternative Communicator Max, his friends Florian and Bastian, and his mother. While the young people follow a collaborative, dialogical strategy of sense-making with Max, the mother follows a monological strategy oriented towards the norm of autonomous speakership.

Participants in this case have chosen a side-by-side arrangement so that they can all look at the surface of the communication aid and follow the production process of the electronic utterances. (The picture shows the arrangement in line 01.) The topic is Max's recent holidays in England. After being told that he visited many cathedrals with his parents, his friend asks him, whether he was forced to do so (*was he forced to come with you* l. 01). Max answers this question with the help of his Talker with a full sentence, which takes him more than 180 seconds. He uses a software similar to the one known from smart phones that suggests word completions after the first letter(s) has/have been selected. The whole composition process is immediately fed into the speech synthesis system. The

right-hand columns show M's activities on the computer, which are visible to the others and therefore part of the interaction.

Cathedrals (Max_03.09.11, 22:27-24:24)

mother   Max   Bastian   Florian
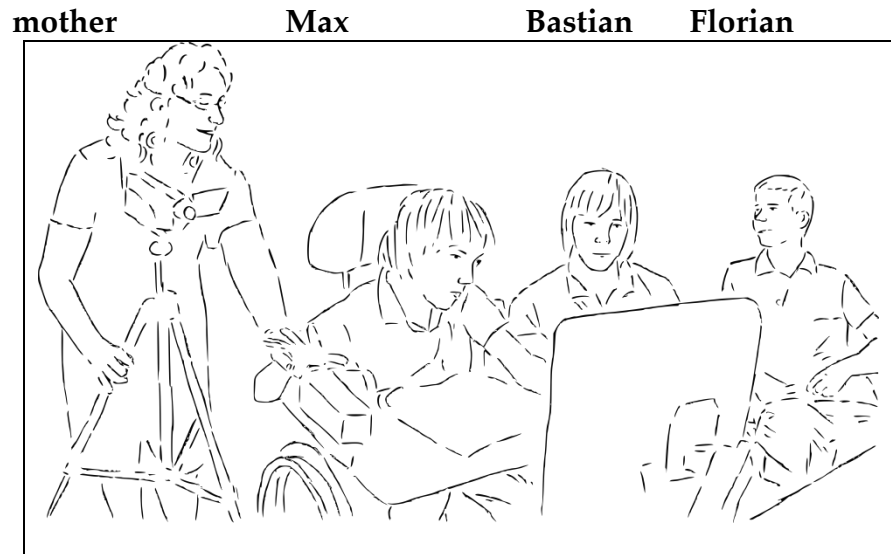
```
01   Ba→mo:  wurde er geZWUNgen mit z
             (.) mitzukommen;
             was he forced to (.) to
come with you;

02   mo  :   [e::: se [e he he

03   Ba-e:           [looks at Talker

04   M -e:   [looks behind to Mu

05   mo  :   JEIN;
             yes and no;

06   M -e:   looks at Tobii

07   Ba  :   [e he he he he he
08   Fl  :   [e he he he he

09   mo  :   NEIN;
             no;

10           so kann man das NICH sagen;
             you can't put it that way;

11    → M:   sag du mal SELber;
             now say it yourself;
```

```
12            (1.6)
13   Fl  :    [(xx[x)
14   mo  :       [((giggles))

15   Fl  :    [((laughs))
16   Ba  :    [((laughs))

17   Fl  :    NEE nee;
              no no;

18            mal im ERNST jetzt; ehe
              let's be serious now; he he

19            ((sniffs))

20            (1.7)
21   M   :                                M
        -s:   EM;
              (letter name)

22            (1.9)

23      -s:   MIR;
              for-me;

24            (3.0)

25       :                                Mir

26            (4.4)

27       :                                Mir w

        -s:   WE;
              (letter name)

28   Ba  :    <<p>war   langweilig>
                 (it) was boring
              (= it was boring for me)

29   M   :    ((smiles))

30   Fl  :    ich glaub AUCH dass das
              kommt,
              I also think this is coming
up,

31   Ba  :    e [he he
32   mo  :      [ha ha

33            (1.5)

34   M -s:    WAR;
              (it) was

35            (0.5)
```

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```
36   Ba  :    JA,
              yes,

37   Fl-e:    [nods, looks at Bastian

38   Ba-g:    [nods, looks at Florian
39       :    [hm_m,

40    -e:     looks at computer screen

41           (1.1)

42   Mu→ Ba/Fl: nu; (erscht) WAR;
              well; (its only) 'was';

43           (1.6)

44           was [für ADjektive jetzt
                  kommen des WEISS ma no
                  net; oder?
              you don't know the
adjective yet; do
              you?

45   M  :                              [Mir war

46   Fl-g:        [waves right
arm,~'well'
47                    [<<pp>ja>>
                    yes

48   M  :                              Mir war d

        -s:    DE
              (letter name)

49           (2.3)

50    -s:    DAS
              it

51           (1.9)

52       :                             Mir war das

53   mo  :    <<p>mir WAR das->
              for-me it was-

54           (8.4)

55   M  :                              Mir war das z

        -s:    ZETT
              (letter name)
```

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```
56              (1.6)                          ┌ ─ ─ ─ ─ ─ ─ ─ ┐
                                               │               │
57          :                                  ─ Mir war das zu
        -s:     [ZU                            │               │
                 too                           │               │
                                               │               │
58   Fl :       [<<pp>ZU->                     │               │
                 too-                          │               │
                                               │               │
59              (1.6)                          │               │
                                               │               │
60   Ba :   mir war das ZU [langweilig;        │               │
            for me was it too boring;          │               │
            (it was too boring for me)         │               │
                                               │               │
61   M  :                                       [Mir war das z ┊ deletes 'u'
                                               │               └ ─ ─ ─ ─ ─ ─
        -s:                    [ZETT;          │               │
                                               │               │
(letter name)                                  │               │
                                               │               │
62   Fl :   ʔhmʔhm                             │               │
                                               │               │
63   mo :   NEIN,                              │               │
            no,                                │               │
                                               │               │
64              (1.1)                          │               │
                                               │               │
65          [ich WEISS was er will;            │               │
            I know what he wants               │               │
                                               │               │
66   M -s:   [ZU                               │               │
             too                               │               │
                                               │               │
67              (0.7)                          │               │
                                               │               │
68          :                                  ┌ ─ ─ ─ ─ ─ ─ ─ ┘
69              (1.1)                          │ ot
                                               │               │
70    -g:   turns back to Mu,                  │               │
71    -e:   looks at mother, smiles            │               │
                                               │               │
72   mo :   ja,                                │               │
            yes,                               │               │
                                               │               │
73          SCHREIB schreib schreib,           │               │
            write write write;                 │               │
                                               │               │
74          ich WEISS was du schon             │               │
            sagen [willsch;=                   │               │
            I know what you want to say        │               │
                                               │               │
75   M -e:          [turns to Talker           │               │
again                                          │               │
                                               │               │
76   mo :   =ja ich WEISS;                     └ ─ ─ ─ ─ ─ ─ ─ ┘
```

```
              yes I know;

77            SCHREIB,
              write,

78            (0.7)

79   M    :   ä

80            (1.9)

81   Fl   :   [die mama soll do_net
              alles verRAten; gell? he he
              mom shouldn't give away all
secrets;
              should she? he he

82    -e:     [looks at mother, then at
Max

83   mo   :   e[HE

84   M -g:     [turns back to Mu

85   M -e:    [looks at mo
         :    [<<f> eh!>

86   All [((laugh))

87   Fl-e:    looks at Talker

88   mo   :   ja du [sollsch SCHREIben;
              well you are supposed to
write;

89   M  -e:         [looks again at
Talker

90            (1.0)

91   mo   :   nich auf MICH kucken.
              not look at me.

92            (2.3)

93   M    :
     -s:      EM;
              (letter name)

94            (3.3)

95   Ba   :   <<pp>mir war das zu m::>
              for me it was too m::

96   M    :   ((laughs))
```

┌─────────────┐
│   │
│   │
│   │
│   │
│ Mir war das zu │
│ m   │
│   │
│   │
└─────────────┘

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```
97   mo   :   zu EM.
                too 'm'.

98             ich dachte zu VAU;
                I thought too 'v';

99   M    :   <<f>ä:::[:!>

100  mo   :        [Oder?
                    or?

101  M    :   <<f>ä:h_n>

102           (2.8)

103  M    :                              Mir war das zu ¦deletes m
     -s:   ZU
           too

104  Fl   :   dann [wirds DOCH vau sein,
                so it will be 'v',

     -e:           [looks at mother and
                    then at Talker

105           ((laughs loudly))

106           (0.8)

107  M    :                              Mir war das zu
                                         v
     -s:   VAU;
           (letter name)

108           (1.9)

109    -s:   VIEL;
             much

110  Fl   :   <<p>mir war das zu [VIEL;>
                it was too much for me

111  M    :                              [Mir war das
                                          zu viel
112           (1.8)

113    -s:   mir WAR das zu [viel;
               it was too much for me

114    -e:                   [half-turn
             back, smiles

115  Ba   :   [e he

       -e:   [looks at mother
```

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```
116  Fl  :    (AN[strengend)?
              (exhausting?)

117   -e:      [looks at mother

118  mo  :      [also [er fand die
SCHÖN,
                 well   he liked them

119  M -e:          [looks down

120  mo  :   aber MANCHmal,
             but sometimes

121          wenn wir zu [VIEle
             besichtigt haben,
             when we had visited too
many,

122  M -e:            [looks at
Talker

123  mo  :   war es ihm zu VIEL.
             it was too much for him
```
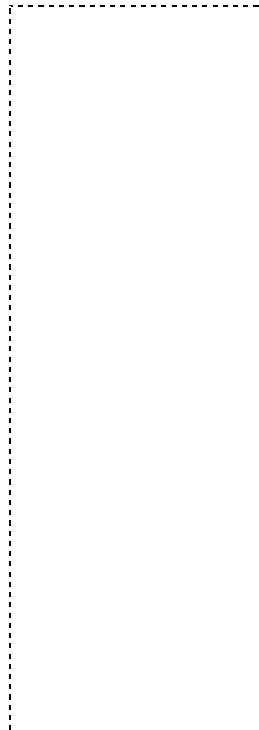
Just like Regina, Max is able to produce a relatively complex, in this case even grammatically well-formed sentence (*mir war das zu viel*) by means of his 'Talker', and as ine Regina's case, it takes him a very long time to produce this answer. However, different from Regina's case, his three co-participants can watch him putting this sentence together on the computer, and they actively contribute to and thereby shape the production process. They can look over his shoulder and observe his activities on the screen, and they can also listen to the speech output of the omputer, which synthesizes every single letter and word Max activates via gaze. Both the seating arrangement (cf. Norén et al. 2013) and the specific settings of the program therefore allow for a much more open system of hinting and guessing than in the case of Regina. Max shares his sentence building with his co-participants, so they are not confronted with phases during which nothing

happens and the Augmented/Alternative Speaker must completely withdraw from interaction.

Against this background of common resources, the mother's and the boys' strategies to co-participate in Max' turn-construction are quite different, however. The boys' strategy is to make use of all the cues Max provides on the screen in order to guess what he wants to say, long before he has actually assembled the words for the complete sentence (cf. Bloch 2011 on collaborative completions). There are several of these guesses (mostly uttered in a low voice), and they come pretty close to the intended meaning. The first guess already occurs after Max has selected the first word and the first letter of the second word of his emerging sentence (*mir w*, line 23/27), a highly projective constructional beginning in German, which, in the given context, makes a dative-experiencer construction predictable.[94] Bastian makes use of this projective power and tries out a first continuation (*... war langweilig*, '(for me it) was boring' l. 28). Max neither accepts nor rejects this completion, but first completes the word starting with the letter 'w' in the way predicted by Bastian, i.e. he makes the machine say *war* (l. 34). He adds the pronoun *das*, which anaphorically refers to 'visiting the cathedrals' (l. 48), and then the grade particle *zu* 'too' (l. 57). As all

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[94] Subject-less construction with a dative experiencer NP in the preverbal slot and a subsequent copula are highly marked and restricted to a handful of adjectives in the post-copula slot, all of which refer to bodily sensations (*kalt, warm, schwindelig, schlecht, schwarz vor den Augen ...* 'X was/felt cold/warm/dizzy/sick/black before the eyes...') and certain mental states (*klar, wichtig, ...* 'obvious, important...').

these additional elements are compatible with an emergent dative-experiencer construction, Bastian suggests a second, slightly adapted candidate continuation (*mir war das zu langweilig*, 'it was too boring for me', l. 60). Hint-and-guess sequences of the kind Bastian wants to initiate here are of course very common in AAC as well as in other conversational interactions in which one of the participants is challenged in one way or other (Hörmeyer, Renner 2013; Laakso & Klippi 1999; Goodwin 1995, 2000; Bauer & Auer 2009). Their big advantage is that the impaired speaker can make his or her co-participants do some of the formulation work s/he finds difficult or impossible to do. In AAC, hint-and-guess sequences are a suitable way to shorten the tedious process of putting together a complete sentence on the computer.

Max, however, does not accept the help of his friend. Instead of confirming or rejecting Bastian's conjectures, he continues to produce his sentence. His final version (*mir war das zu viel* 'for me, it was too much') does not differ much in meaning from the one suggested by Bastian ('for me, it was too boring'), although it expresses a somewhat more positive evaluation of the holidays – which may be recipient-designed to the co-present mother. More importantly, by bringing the utterance to completion by himself, Max presents himself as an autonomous speaker. But it is not only Max who wants to be an autonomous speaker, dependent on a machine, but independent from his coparticipants. Throughout the extract, we can observe his mother actively preventing him and his friends from engaging into any dialogical shortcuts via a conjecture & confirmation/rejection sequence. She contradicts Bastian's first guess (*you don't know the adjective yet; do you?* l. 44) and explicitly rejects his second (l. 63),

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claiming that she knows the 'correct' utterance Max wants to produce (*I know what he wants* l. 65).

Max's mother not only prevents her son and his friends from engaging in dialogical shortcuts, she also refuses to step in for him as a porte-parole who answers his friends' questions, even though she explicitly states that she knows the answers. At various points in the interaction, Max looks at his mother, which, because of their side-by-side arrangement, means that he must turn his whole upper body (cf. l. 04, 70, 84). In doing so he appeals to his mother to *speak for* him, another collaborative strategy common in conversations with people with language impairments (Croteau et al. 2004). Max's mother does not accept this role, however. Instead, she explicitly asks her son to use the 'Talker', for which she first uses the term 'say' (*sag du mal SELber* 'now say it yourself', l. 11), later the term 'write' (*SCHREIB schreib schreib*, l. 73; *SCHREIB* l. 77, *ja du sollsch schreiben, nich auf MICH kucken*, 'well you are supposed to write, not look at me', l. 88/91). Only after Max has produced a full sentence, conforming to the rules of the grammar of written German, does his mother explain his assessment to the friends (*well, he liked them, but sometimes, when we had visited too many, it was too much for him,* l. 118-123). Of course it may be asked why Max's mother withholds any help just in order to allow Max to finish the sequence providing the explanation she could already have given much earlier as a direct response to Bastian's question in line 01. The answer is simple: the mother's regulatory activities are not aimed at establishing understanding, but rather, they aim at turning a potentially collaborative and dialogical activity into a monological one, based on the idea of an autonomous speaker. The electronic aid is seen as a chance for her son to formulate his thoughts and feelings independently from his

co-participants. It is for this reason that the mother favors the machine over collaborative strategies. Dependency on a 'Talker' is given preference over dependency on co-participants. The whole sequence is for Max's mother a didactic sequence, teaching her son to use the machine. Once Max has done his homework – but only then! –, she readily steps in to explain the meaning of the computer-produced sentence to his friends.

Yet despite this insistence on what appears to be a very "cognitive" approach to intersubjectivity, mother's interventions do not turn the sequence into a disembodied one. Rather, all participants maintain a joint bodily orientation to the screen, to Max and to the mother, and in addition, Max and his mother are in synchrony. All participants, although pursuing different preferences (Bastian and Florian want to provide fast guesses, Max wants his mother to help, and his mother wants a complete sentence), they manage to achieve intercorporeality – an intercorporeality that includes the machine. What appears like a senseless cognitive exercise in sentence formation is transformed into a <u>game</u> of hinting and guessing. The usual third sequential components of hint-and-guess sequences, i.e. confirmations or rejections, are notoriously absent (Max refuses to give them), but this absence is not a sign of lack of cooperation: instead it increases suspense.

Machine and body integrated (Example 3)

In the preceding section we argued that for Augmented/Alternative Communicators and their partners, there is a tension between two different and opposing strategies to achieve understanding. One route is based on the idea of the autonomous speaker who is able to produce full, grammatical and ideally

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context-independent sentences all on his/her own. This is the "cognitive" way. The language ideology behind this route is firmly anchored in the norms of written language. By building a complete sentence Max does not orient to the demands of fast and efficient sense-making in face-to-face interaction, but to the demands of the written language. (Note the frequent reference to letters throughout the extract, favored by the program on Max's computer, which spells out the written letters.) The other route is based on collaboration in achieving understanding, i.e. on a dialogical process of sense-making. This is the more "intercorporeal" route. The tension between these two routes to understanding was reflected in extract (2) by the different strategies of Max's co-participants.

Our last extract shows that there are ways to fuse electronic and bodily communicative resources into one dialogical, collaborative structure. Augmented/Alternative Communicator Nina is in a conversation with her assistant Lutz and her mother. The picture below shows the constellation at line 01. The extract starts with Lutz's question about Nina's wishes for her future. To answer this question Nina uses the communication aid and various bodily resources.

Works (Nina_19.12.08, 28:38-29:15)
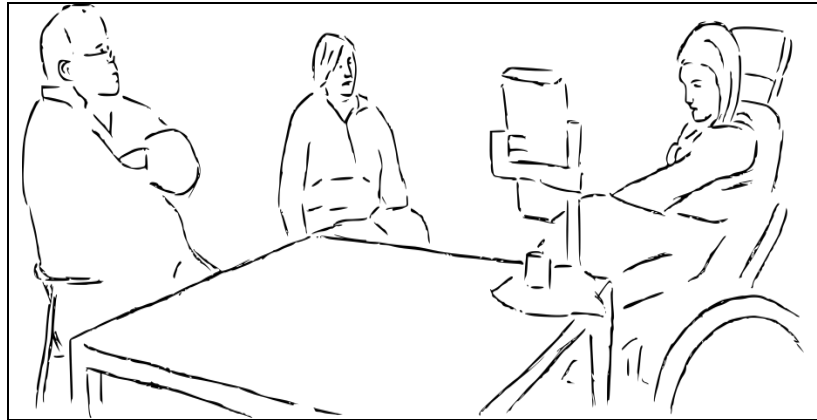
((In lines 01-08, Nina looks at the computer screen only; Lu and Mother
look at Nina all the time.))

```
01   Lu:     und was NOCH;=
             and what else

02           =(da war noch) (.) noch [MEHR;
               (there was still)       still      more;

03   Ni  :                           [hm

04   Lu  :   was is nOch (.) für dich so WICH[tig.
             what else is important for you

05   Ni-s:                                  [nicht.
                                             not

06           (17.6)
```



```
07    -s:    arbeitet.
             works.
```

```
08           (1.0)
      -e:    looks at Lu.
```

```
09   Lu  :   °h ARbeiten?
               to work ?

10           (0.5)

11   Ni-g:   lowers chin to chest

12    -e:    [gaze to mother

13   Lu  :   [DU;
              you

14           (0.6)

15   Ni-e:   gaze back to Lutz

16   Lu  :   dass du eine ARbeit hAst?
             that you have a job?

17   Ni  :   [HM.    [↑hm::::;

18    -g:    [nods   [nods

19    -e:           [looks at mother

20   Lu  :          [ja.
                     yes

21   Lu  :   <<pp>ge[NAU;>
                   exactly

22   Ni-e:          [looks at Lutz

23   Lu  :   dass du eine ARbeit hast.
             what kind of work

24           (0.5)

25           was was für ne? was für VORstellungen hast du da;
             what kind of ideas do you have for that;
```

Before the beginning of the extract Lutz has asked Nina about her wishes for the future; line 01 (*what is also important for you*) pursues her answer. (The word *not* that Nina produces through her 'Talker' simultaneously to Lutz's question belongs to a previous utterance and is deleted by her from the screen directly after its production.) After Lutz's initial question Nina has the floor. In this responsive position, where she has been selected as the next speaker, no problem of turn-taking arises. Nina starts to work on her computer while co-participants

remain attentive and focused on her. It takes her 17 seconds to produce the verb form *arbeitet* 'works' in the 3rd person singular form (l. 07).[95] Lutz suggests the infinite form *arbeiten* 'to work' via an other-repair marked as a question by upward intonation (*to work?* l. 09). In response, Nina lowers her chin to the chest (l. 11). This is an intentionally produced gesture which for her and her most important co-participants has the conventional meaning of 'speaker reference'; Lutz therefore interprets it as Nina's deictic reference to herself and rephrases it verbally (*you* l. 13). Lutz now integrates the machine-produced word *arbeiten* and the bodily reference to the speaker and reformulates it as *dass du eine ARbeit hAst?* 'that you have a job?' (l. 16). This interpretation is accepted by Nina with two emphatic nods, accompanied by vocalizations. The subtopic is closed by Lutz, who agrees (l. 21) and once again repeats his formulation of Nina's turn with falling intonation.

In this little extract we can observe the interplay and integration of the following interactional resources:

1. Communication aid: Nina does not produce a complete sentence with the machine. Instead she produces just one word, which serves as a semantic hint for co-participants' collaborative work. Since she is satisfied with one word, the search process is relatively short.

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[95] The inflected form is produced by the program automatically because the verb is used in initial position. Apparently the programmers had verb-first questions or informal verb-first declarative sentences such as *stimmt* 'that's right' in mind, in which the pronoun in the pre-verbal topic position can be omitted.

2. Conventionalized deictic gesture: The lowering of the chin is part of a system of body signs that Nina has established with her assistants. By lowering her chin Nina points to herself. While Lutz catches the meaning of the movement directly after its production, the mother – who Nina directly addresses by gaze – does not seem to see an intentional gesture at all.[96]

3. Nodding: In contrast to the deictic gesture of lowering the chin, nodding is a conventionalized gesture that is also understood by unfamiliar partners. Nina uses nodding as a fast and unproblematic way to accept conjectures (Hörmeyer & Renner 2013). She can intensify the movement (nodding one time or several times) or combine it with other resources such as vocalizations to express hedged agreement or emphatic consent.

4. Vocalization: Nina uses vocalizations as intensifiers for nodding gestures, as in this example, or as free-standing elements to express various kinds of affirmation or comment.

5. Gaze: Nina uses eye gaze to signal turn taking. By gazing at her communication aid she shows her involvement with the utterance production. By gazing at her co-participants she signals the end of an utterance production and invites her partners to engage in collaborative work.

Nina combines these resources in alignment with her co-participants. By doing so she can react directly to her partners so that the actions of Nina and Lutz are synchronized.

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[96] Nina and her mother meet only rarely.

Conclusion

In this paper we have looked at a particular kind of communication which includes the use of computer-based speech aids by people with severe cerebral palsy. Using electronic devices to 'supplement' an ongoing face-to-face interaction is of course not unusual at a time when mobile phones are permanent companions of face-to-face encounters, and when some participants in an encounter take may part in it via skype or video-conferencing. In all these cases, machines are part of the interaction. However, they have a different status: in the case of the mobile phone, they are competitors for the user's focus of attention and need to be integrated in and/or synchronized with the ongoing interaction without disturbing it; in the case of video-conferences, the 'external' interactants are extensions of the interactional constellation. In AAC, the speech output system is a sometimes indispensable resource for making mutual understanding possible at all, under conditions of severely impaired bodily and impossible articulatory communication.

We have argued that the reduced bodily capacities and the 'uncontrolled bodies' of the participants suffering from CP make bodily synchronization with their partners a considerable challenge. What is more, the electronic speech aid not only produces a disembodied language (synthetic speech), but also has a massive impact on the mutual corporeal attunement of the participants. It slows down the production of turns to such a degree that sequential structure – and hence also mutual understanding – are in danger of being destroyed, and it brings about the Augmented/Alternative Communicator's withdrawal from the ongoing focused interaction. It was shown that these detrimental effects of AAC

can lead to a breakdown in temporal, sequential and topical structure, and to interactional failure and lack of understanding. However, it was also shown that there are ways to overcome these risks. On the one hand, the negative impact of the 'talking machine' can be minimized when the user reduces the time needed to output speech by refraining from putting together complex utterances; this strategy requires co-participants' willingness and competence to integrate the machine-produced semantic hint into a sequence of 'post-processing'. Another way of meeting the challenges and risks of a 'talking machine' is a 'moderator' who channels and controls co-participants' activities despite the Augmented / Alternative Communicator's focus on the machine, even during the production of a complex utterance. We argue that certain bodily arrangements (e.g., when all participants have access to the screen or can hear the production process) may help to do so. In both ways, the machine can be 'embodied', and the interaction can – despite CP – become an 'intercorporeal' one.

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Challenges of Conducting Interaction with Technologically-Mediated Bodies

Elizabeth Keating

Abstract

This chapter addresses challenges for the body in technologically-mediated communication. I discuss a group of computer gamers who play together onscreen while coordinating action offscreen, and a group of engineers who are working together in a technologically-mediated virtual global office space. These interactants manage a range of resources to achieve coordinated actions in mediated sensory fields. They coordinate both real and digital representations of the self and others to produce and read cues about what's going on in order to achieve accountable patterns of meaning, inference and action.

Introduction[97]

      Technology continues to provide new territories for interaction, expanding possibilities for casual talk, for professional collaborations, and for creative play. The power of communication technology to transcend spatial constraints and even to reconfigure space has been clear since the telephone was invented, and is even more apparent with mobile phones and other devices. For scholars interested in understanding symbolic structures and how people creatively develop shared meanings, communication technology, such as the telephone, affords a fertile ground for understanding critical elements in the ways people organize interaction (see e.g. Sacks, Schegloff, and Jefferson 1974), and in the case of the telephone, how they manage to build coherence in spite of a reduced number of signals possible through an auditory-only channel

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