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FROM INFANTS' REACTING TO UNDERSTANDING: GROUNDING MATURE COMMUNICATION AND SOCIALITY THROUGH TURN-TAKING AND SEQUENCING

I will investigate a number of pre-linguistic infants interacting with caregivers, and attempt to demonstrate that infants' natural reactions (laughing, crying, gazing) function as incipient interactional turn-taking devices employed to non-cognitively initiate communication with caregivers, fostering infant sociality. To demonstrate my claims, I analyze multiple fragments of infant/caregiver interaction to determine how infants come to participate in the interaction order through their natural reactions. The results demonstrate how interaction between infants and caregivers creates an interactional sequence possibly unique to infant/caregiver interaction[1], which grounds more mature interactional sequences. The results provide clues as to how infants become more communicative through being embedded in mature turn-taking, the foundation for social interaction order. The results will further indicate that it is indeed instances when infants' natural reactions are treated as some sort of turn, that ontogenetically ground more mature, conversation-analytic turn-taking, as well as future infant communication and cognition.

Key words: cognition, conversation analysis, infant/caregiver interaction, infant development, infant sociality, Wittgenstein

Introduction

"We do not merely imbibe or absorb those aspects of our culture with which we come into contact, we react." (Winch, 1997, p. 198, emphasis in original) and, "Thomas Reid in the eighteenth century and Ludwig Wittgenstein in the twentieth made strong cases for the existence of 'communication systems' that *must be in place* if there is to be the acquisition of any language [society and culture]…" (Harre and Robinson, 1997, p. 483, brackets and emphasis added). These quotes by Winch, and Harre and Robinson provide the leitmotif for this research. It is the contention

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[1] Possibly including pet training, especially dogs.

here that individual human biological reactions are predictable, and ground the very society and culture with which we as infants first come into contact. It is these reactions seen as a form of communication by caregivers (CGs) that allow other more developed forms to be fostered.

This paper hopes to help answer at least one general question regarding sociality, "How is social ability in individual infants fostered?" One common response is that it is fostered through some form of innate cognitive phenomena. Opposing this stance, and alluded to above, this paper will attempt to demonstrate how a set of infants' (INs') biological capacities, their natural reactions (NRs; laughing, gazing, sucking at a nipple, and so on) are organized into predictable and thus meaningful communication via the turn-taking actions and attributions from their CG's while contending with both expected and unexpected infant NRs.

I divide the remainder of the introduction into three parts: Turn-taking, agency and the 'as if' orientation, and natural reactions.

Turn-taking

I will initiate this study with the general conceptualization of turns. In this section, I will first mention turns common to many of us, then move on to conversation analytic (CA) turns, then to incipient turns that I here claim precede and ground the more mature CA turns.

Many of us are familiar with various types of rule-governed social turn-taking. In the USA, one may find the vestiges of the 'ladies first' rule, also, a robustly defended 'emergency room triage' rule, 'turns at bat' in baseball, 'traffic signal' rules, and so on, indefinitely. Conversational turn-taking however comprises a special case. These conversation (CA) turns are interactional devices for getting something accomplished. The latter claim was brought to light as the result of an academic endeavor (Sacks, Schegloff, and Jefferson, 1974) that has been increasingly refined for over 35 years.

At their most basic, CA turns simply are "…how people get to talk and for how long and with what consequences." (Schegloff, 2007, p. xi). In relation to this specific type of turn-taking, Schegloff (2007) posits two types of organization: Turn-taking itself, and sequence organization. The first relates to the relative ordering of speakers, while the second constitutes the creation of regular interactional sequences co-constructed by participants through turn-taking.

I would here like to posit the existence of an incipient turn-taking system that I further posit, necessarily precedes CA turn-taking. The originators of CA turn-taking (Sacks, Schegloff, Jefferson, 1974) discovered this system in relation to turns at *talk* (see above quote) between mature social members. Thus, turn-taking in its original CA formulation may appear not to be directly applicable to IN/CG interaction, since CA descriptors, such as 'recipient design', 'sequencing', 'repair', 'speaker selection', 'talk', and so on, all involve member agency. Thus, their discovery may not fully apply to IN/CG interaction, which has at least one immature,

non-agentful, pre-linguistic member. However, one claim here is that interaction *does* ensue between INs and CGs, and that this type of interaction is comprised of incipient (pre-CA) turns and sequences. An additional complimentary claim is that CA turn-taking can be a valuable lens through which we can understand IN/CG interaction.

CA turn-taking, as mentioned, is an interactional framework that grounds social organization. It has been posited as the primordial site of sociality that provides the framework for communication, and the learning of language and culture. The concept of turn-taking is also fundamental to this research project in that it also has been claimed that *all* societies exhibit an interactional organization through turn-taking. Interactional turn-taking is "…so deeply rooted that it can transcend linguistic and cultural diversity…" (Schegloff, 2007, p. xiii). A claim related to more general social organization has been corroborated by other researchers, "… these [social organizational principles] are at some level human universals." (Erickson and Shultz, 1981, p. 70, brackets added). And further evidence from a different literature source, "The underlying principles governing human interaction appear to be independent of the specific languages or specific cultures." (Levinson, 2006, p. 13), suggesting "… a phylogenetic priority of interaction principles over language in the history of the species." (p. 13). Thus, since INs cannot do CA turns (they cannot talk, design, and so on), some form of turn-taking must somehow be massively implicated in the ontogenetic origin of INs' social ability. It is one goal of this research to explore at least some of the features of such turn-taking, and how it originates and operates.

If the universalistic claims of Schegloff (2007), and Erickson and Shultz (1981), and others mentioned above are correct, that turn-taking for conversation at least is universal, and if social organization of *all* societies is even minimally accomplished through CA turn-taking, then we can begin to examine various responses to the earlier posed question, "How do infants become more mature members?". It may, in light of Schegloff's, and Erickson and Shultz's claim, seem necessary that turn-taking of some sort must somehow be implicated in the process. One omnipresent, traditional and insidious social-scientific response to this particular query was that "[Adult/child interaction is] a continuous effort to impose on the child ways of seeing, feeling and acting at which he [that child] would not have arrived spontaneously." (Durkheim, 1938, brackets added). In this orientation, by explicitly being taught and exposed to social and linguistic rules, infants build up a store of social knowledge which INs access when needed, and implicit in Durkheim's assertion, correctly apply that knowledge in various social contexts.

Though accepted by many researchers for many years, multiple incommensurable problems emerge with Durkheim's approach, for example some Wittgenstein-inspired questions, 'How would infants access this (putatively) stored cognitive knowledge?', and if infants are somehow able to accomplish access, then, 'How would infants access the *correct* knowledge?', and further, 'Would one specific unit

of putatively stored knowledge once accessed, apply to similar social contingencies as well, or would it only apply to the particular contingency that originally matched the rule formulation?', and so on.

One effective response to Durkheim's research has been Wootton's (1997) CA work. He found Durkheim's orientation to the problem of how children gain access to mature social and linguistic forms to be invalid; at minimum in the sense that a caregiver need not provide a child explicit rules related to language or communication on every interactional occasion. Rather, according to Wootton, young children communicate and come to be social by "…acting strategically so as *to take account of what has happened* in any given encounter." (1997, p. 4, emphasis added). The results of Wootton's research seem to have resolved the problem engendered by Durkheim's putative solution. Problems, however, linger. Wootton's child-subject's age was approximately between one to three years old at the time of his study; children of this age already demonstrate abilities to act more maturely than INs. Additionally, children between one and three years can act, and thus are able to deploy more mature turn-taking resources. Thus, the success of Wootton's research leads to a further question, "How is interaction ordered between CGs and children *younger than 1 year*?". Pre-linguistic infants, by definition, cannot speak, and also certainly cannot know (and thus logically cannot apply) turn-taking rules, and certainly do not yet possess any ability to '…take account of what has happened…'; as was accomplished by the child in Wootton's study, who manifests abilities much beyond any infant in this study. Such considerations engender an even more fundamental question. To the previously posited, "How do infants become more mature members…", I now append an essential conditional, '…if infants do not possess innate social, linguistic, or cognitive abilities of any type?"

CG's explicitly teach neither turn-taking nor sequencing rules, but rather do so inadvertently, creating interaction order and regularity, getting things done sequentially, such as feeding INs, bringing about INs' laugh/smile, and so on. Interaction order is achieved *through* CGs designing and employing turns, for accomplishing the activity at hand. Interaction order is here seen, as opposed to traditional social science studies, "…as the foundation for mutual understanding – rather than maintaining that mutual understanding (or shared concepts) is the foundation for achieving social order." (Rawls, 2006, in Garfinkel, 2006, p. 81). The area of concern here is the mutual achievement of interaction order. Individual CG motives do not and cannot explain how and why certain practices are ordered. This research will indirectly provide evidence for the claim that individual motives/cognition are not necessary to produce orderly interaction.

The existence of interactional turn-taking in adult/adult speech exchanges begs multiple questions regarding IN/CG interaction. First and most general among these may be, 'Are infants members of society?' This question naturally emerges because INs by definition are pre-linguistic, thus cannot talk, and seemingly cannot be held accountable for 'actions' they do or do not commit; INs also cannot hold

others accountable for their actions. Further, they also cannot recognize a turn's projected end, and so on; finally, they are not agents.

Agency and the 'as if' orientation

As mentioned earlier, participant agency was implicit and elemental in the original formulation of turn-taking (Sacks, Schegloff, and Jefferson, 1974), and one fundamental claim of conversation analysts is that their methodology is a tool to analyze only *competent* members' talk (Edwards, 2008), and competent members by definition are agents. Additionally, a CA maxim states that, "… the target of its [CA's] inquiries stands where talk amounts to *action*…" (Schegloff, 1991, p. 46, brackets and emphasis added). From an analytic viewpoint external to the IN/CG context, INs of the age in this study (two to four weeks) are not agents and thus cannot act. Infants, as outlined earlier, can only largely *re*act, but it is essential that we see members treat INs *as if* they are agents, *as if* INs are taking some sort of turns – the *as if* orientation being implicitly posited as possibly the essential feature of IN/CG incipient turn-taking in this paper.

Regarding this claim, I analytically rely on how participants treat each other in interaction. In this vein, it is important that if CGs treat INs *as* members while interacting, *as* agentful participants, as taking some type of turn, doing so constitutes a proleptic stance that seems essential to the INs' development. The INs' biological capacities to react, their natural reactions (NRs), are viewed here as their incipient disposition to *socially* interact. As infants' ability to socially interact normally matures, their NRs may, implicitly, count as interactional participation through turn-taking with their interlocutors, CGs, constituting natural, pre-CA turns, making CA turn-taking a natural phenomenon since it is rooted in pre-CA turn-taking, rooted in NRs.

'Agency' has been defined as the ability to voluntarily act correctly, deemed so since one who is an agent, has a choice to act incorrectly, (Winch, 1958, and Hacker 2007/8). Of course INs cannot choose to (not) do so, but, as we will see, INs are embedded in interaction as if they were agents, as if they take mature turns, and it is this *as if* orientation that helps provide the framework in IN/CG interaction for their development.

Individual actors' cognition, as mentioned, is not necessary for regularity and predictability to be manifested in social interaction. Since social interaction is a prerequisite for understanding (cognition), individual cognition, such as motives, is excluded as a cause of social order, and thus cannot explain how and why any particular interaction is sequentially ordered. Rather, I am in accord with Rawls' (2006) claim that social order, here manifest through incipient turn-taking and sequencing, serves "…as the foundation for mutual understanding – rather than maintaining that mutual understanding (or shared concepts) is the foundation for achieving social order." (p. 81). Thus, in these terms, social interaction logically (necessarily) precedes understanding. In concord is Hacker's (1993/98) contention, that training (social interaction) antedates understanding (p. 112).

Since a priori cognitive, linguistic, and social skills are not necessary to participate in social interaction, IN/CG interaction logically must initially comprise, at least in part, a sort of interaction that *tends towards* the behavioristic (Berducci, 2004). This claim is consistent with both Rawls' and Hacker's above. Rather than any innate social skills, all infants possess innate *biological* abilities, e.g. the five senses and the ability to move, which at minimum disposes them to discriminate among and naturally react (predictably) to objects, including co-present humans. These INs' natural reactive capacities dispose them to initially conform to (as oppose to follow) communicative (normative) rules, such as turn-taking, which facilitate their initiation into more mature social membership. It is massively relevant that INs react to internal (bodily) or interactional (external) stimuli in a *regular and predictable* manner since turn-taking, sequencing, communication, and society all possess as part of their definitions, the notions of regularity and predictability. "We do not find regularities in life because we have rules. It is because there are regularities that rule following is possible" (Harre and Robinson, 1997, p. 493). The regularities in this project are INs' NRs: Natural reactions to comfort, discomfort, pleasure, hunger, and so on. If such reactions did not exist, or if they were not regular, consistent and predictable, human communication (society, language, culture, and so on) as we know it, would not be able to exist.

As we will see, INs' NRs can be brought about by CGs *acting on* INs, "The most elementary way in which human beings, as patients [those acted on], are acted upon is by impact of objects and, in childhood, by parental manipulation. A child is picked up, put down, turned over, pushed, pulled, bathed, dried, warmed, fed, and so on and so forth – subjection to the causal ministries of parents and others being part of the neonate's natural condition." (Hacker, 2008, p. 76).

I will now present a simplified fragment from the data analysis to demonstrate some of the concepts I have introduced.

01. FA:	((lifts IN onto left shoulder, taps IN's back to induce burp))	act on
02. IN:	((burps))	NR
03. MO:	good job	assess/close
04. FA:	nice job dude	assess/close

In line 01, the father acts on the infant, the patient, in order to burp him (one example of a NR), in a sense causing line the NR of line 02. However, a necessary logical connection between the tapping and the burping does not exist; the burp need not have happened, though not under the IN's voluntary control. Though the IN did not voluntarily burp, the parents in 03 and 04 follow with assessments that attribute agency to the IN. Assessments, in more mature adult/adult interaction, are deployed in relation to doings, agentful actions, here assessments are proffered to an incipient agency, creating a proleptic stance.

"So, we observe agents acting on patients and bringing about change. Sometimes we are the agent, and we make things happen by doing something to a patient. Sometimes we are the patient, and can feel or see that an agent is acting on us and bringing about a change in us. At other times, we are neither agent nor patient. We may be mere idle observers." (Hacker, 2008, p. 69).

IN behaviors appear to those not involved in the interaction to be just that, behaviors (such as the burp above). INs' (pre-social) behaviors seem not to be *actions*. From an analytic (decontextualized) viewpoint, actions are by definition social. This being so seems to entail that young INs' current inability to act precludes them from being social members. However, contrary to the impression created by what infants *cannot* do in social interaction, I will count infants as members of society, albeit special members, following Garfinkel (2006), "X is a group member, not on the basis of the portrayal of his mode of 'internal activity [cognition],' *but rather is a group member on the basis of the treatment that is paid to him by Y*…. If Y *treats* X as a group member, then X is a group member. This principle is universally applicable, and admits of no qualification or exception." (p. 197, emphasis in the original, brackets added). '…treats X as…' constitutes an operative phrase for this research. It is this 'treating as' that was manifest in the positive assessments in the above example.

Further, INs are humans, a biological category, (immature) members, but not completely persons. Hacker (2007/8) provides a decontextualized analytic view, "While human being is a biological category, person is a moral, legal and social one." (p. 4). INs can have no moral obligation, yet they do have legal status as a person in the USA. However, the view taken here is that it is not up to analysts to classify members according to a preconceived scheme, but what participants in interaction are *seen as*. More generally, yet more in accordance with the perspective here, "'A person' as Kant wrote,' is a subject whose actions can be imputed to him." (Hacker, 2007/8, p. 285).

Additionally, again according to analysts' conceptions, infant behavior is largely if not completely involuntary in Winch (1958) and Hacker's (2007) sense, because INs cannot choose to behave (choose to burp), at minimum because they are acted on by CGs (Hacker), nor can they yet choose to refrain from their behavior (burping). But again, adhering to the situated view, we need to examine data for the CGs' implicit interpretation of INs' behaviors revealed through their interaction.

In the upcoming analysis, if the *as if* attributions that infants are members and persons is accepted, then in this context a question comes to the fore, 'How do infants become *mature* members, mature agents?' I claim here, and will attempt to demonstrate in the data analysis, that it is through INs' NRs taken *as if* they were agentful/voluntary moves with CGs.

Natural reactions

Considering this paper's massive concern with NRs, and their relation to their role in IN/CG interaction, we now need to more closely examine the impetus for focusing on them.

Enter Wittgenstein and Reid. A basic assumption of this research, following Wittgenstein, and Reid (Harre and Robinson, 1997), among others[2], is that a human infant's ability is akin to that of a non-human animal[3]. This type of interaction is initially causal (non-normative), but can be, in normal INs, transformed into its normative counterpart through interaction itself, initially through CGs acting on INs and the *as if* (implicit or explicit) attributing of CGs.

Wittgenstein opposed theorizing, and, as he was a philosopher, did not empirically analyze. However, his claim relevant to this research is that language is grafted onto INs' NRs when interacting with CGs (Wittgenstein, 1958, para. 244; 1981 paras. 540-1; 1998, p. 31). Wittgenstein advanced this claim in reference to his private language argument as to how one's *sensations* are named and agreed to by others. His claim, though not empirically based, is implicitly related to social interaction, since for Wittgenstein, words provided by an 'outside' source, an interlocutor, are connected with an infant's primitive, natural expressions of sensation (NRs), and eventually employed in their place. As an example, a child hurts himself and cries; a co-present caregiver linguistically acts, and provides the child with exclamations, such as 'ouch', and later more sophisticated linguistic devices may be employed by one in pain, for example 'This is killing me.' In such cases, the infant learns new pain behavior as the linguistic form *replaces* the cry (NR).

Wittgenstein's claim has been qualified by Bennet and Hacker (2007) in that some, not all, language is built upon INs' NRs. However, this qualification does not contradict my claim here, which is that NRs foster CGs grafting language onto those NRs, and in doing so, ground IN/CG interaction (incipient turn-taking), and as a consequence, ground the learning and elaboration of different communicative skills.

McDonald (1986) extends Wittgenstein's claim on the language of sensation by arguing persuasively that culture, not merely language, is also built on infants' NRs. This is consistent with the fact that CGs are cultural beings displaying culture, not merely language, through turn-taking. For clarity I should state that language learning is not considered a separate learning here. Rather, learning language, culture, communication, and all forms of cognition are fostered simultaneously.

Data

Please note that in the following data analysis, I have not applied the concept of turn blindly to IN/CG interaction in an attempt to have that type of interaction conform to my methodology. Subsequent to a preparatory viewing of a number of IN/CG videotaped interactions, it appeared that the participants were doing something CA-turn-like, hence the turn-taking orientation of this paper. Additionally, I felt a need to employ turn-taking to analyze IN/CG interaction, since very little

[2] This same or similar claim is also made by other scholars, Reid (year), Lev Vygotsky (Vygotsky, 1987), Simone Weil (year), and P. Winch (1997). Wittgenstein will be emphasized because…

[3] Indeed, as we will see, CGs often speak to INs as they would to a pet.

work has been done in the area; and what has been done (Filipi, 2009; Wootton, 1997) differs from what I propose here.

Please bear in mind that all of the following video fragments are naturalistic, and all fragments were videos made to be seen by non co-present others, typically extended family members. All the videos were made and titled by parents or other family members for their personal use. Names in titles and transcripts were changed for anonymity. A total of 11 fragments were analyzed. For transcription conventions, please see the appendix.

In Fragment 1, four people are co-present (FA, MO, IN, and OS (older sister). The IN is two weeks old. FA non-verbally acts on IN, attempting to get him to burp. Burping in this context is being framed, incorporated into the interaction as an IN action.

Fragment 1 MO is taking video, standing in front of sofa.

01.	FA:	((sitting on sofa, IN in lap))	
02.	FA:	((IN to rt shoulder, begin tapping IN's back))	ACT-ON
03	IN:	((burp))	REACT/INTENDED
04.	FA:	°nn- *li*ttle one° ((tapping, assess burp, not IN))	NEGATIVE ASSESS
05.	IN:	((burp)) (1:27)	REACT/INTENDED
06.	MO:	aw::: good jo::b ((accept+assess))	CLOSE
07.	FA:	nice *jo*b *du*:de ((stop tapping, start rubbing))	CLOSE/ACTING ON

FA in line 02 initiates an incipient (pre-CA) sequence by lifting the IN and tapping his back to induce (akin to a cause) a burp. IN naturally reacts in 03, but FA expresses verbal dissatisfaction in 04 with a rejection token, nn-, followed by a negative assessment of the NR of line 03, °*li*ttle one° , directed to MO. Please note that FA in line 04 is not deploying a negative assessment of the IN as agent. FA continues acting on IN by tapping on IN's back until 05, resulting in a second, CG-intended, and now satisfactory NR (burp). Satisfaction is evidenced by MO's acceptance token, aw:::, followed by MO and FA's positive assessments in lines 06 and 07 of IN as actor, as turn-taker, as someone who did the right thing, attributing agency to the IN. Additionally, in transforming IN into agent, FA takes turn, and in doing so embeds the NR as a CA turn-like phenomenon, co-constructing the sequence. Both FA and MO's acceptance and positive assessment turns work to close the sequence. Additionally, the IN's (natural) achievement, the burp, is marked by FA's changing from tapping (inducing burp) to stroking (affectionately) IN's back, and moving on the next sequence.

Assessments, preceded by an acceptance token, in mature interaction have been analyzed as closings, "…a positive assessment at this point [after the NR in the above sequence] can be heard as retrospectively tying back to the entire direction set [entire incipient sequence] and as achieving closure." (Psathas, 1993, p. 212, brackets added).

Psathas' following three examples originate from direction-giving (Psathas, 1993, p. 212):

(Cherry Orchard)
32. A: big farm big red barn says Mellow Lane all over it you won't miss it
33. C: Ok(h)ay good ((acceptance + positive assessment))
(Apple orchard)
22. A: An then we'll be on your first left
23. C: Oh, oh that sounds easy (0.5) okay: y- ((acceptance + positive assessment))
(Lexicon)
66. A: …building that- the brick building that calls out Lexicon
67. B: Okay good. ((acceptance + positive assessment))

Returning to Fragment 1 IN/CG data, line 02, the first incipient turn of the sequence, CG acting on IN, was non-verbal. In that fragment, a contingency, inadequate burp, needed handling, and this was accomplished through inserting a negative assessment into the act-on>NR>close structure. The closing there was constructed of an acceptance token, aw:::, followed by assessments from multiple participants.

This next fragment, Fragment 2, is a continuation of Fragment 1, and occurs a few seconds later with the same participants; this fragment includes an *unintended* NR (line 03).

01. FA:	((b to mouth,)) gotta keep your hands outta [the way		ACT-ON
02. IN:	((g FA, sucking b - - - - - - - - - - -))		REACT
03. IN:		[((flatus::::))	UNINTENDED EVENT
04. IN:	((g FA, sucking - - - - - - - - - - - - - -))		
05. FA:	((wryly g OS then MO, response to 03))		
06. MO:	eh heh way to go buddy(0.5)that's a rea::l wo:rkin system		CLOSE
07. OS:	heh *heh* he		
08. FA:	atta *boy* ((assess))		CLOSE
09. MO:	arright daddy you're on duty 3 o'clock this morning tomorrow morning		

In 01, FA directs his talk to MO after he acts on the IN by inserting a bottle into his mouth, and IN naturally reacts by sucking, in 02. While doing so, IN continues gazing at FA, and a flatus, an interactional (non-social) event, a phenomenon in the turn but not of the turn, happens. This event occasions FA to react in turn 05 by directing a wry gaze first at IN's older sister (OS) sitting to his left, then to MO to his right. Doing so occasions MO's turn 06, and simultaneously embeds the IN's creature-release-reaction into the interactional sequence. In 06, MO first responds to FA's gaze, and produces a device, 'eh heh', which is a wry verbal counterpart of FA's gaze, accepting the flatus. MO then offers slight humorous sarcasm to

the IN, 'way to go buddy'. This is in contrast to the negative assessment in this position for an inadequate yet intended response, the small burp in Fragment 1, and the positive assessment for the intended NR in that same fragment. Here in Fragment 2, the positive assessment was delivered as a light sarcasm, as may be offered to a close friend or family member in such a context. This sarcasm was followed by a positive assessment of the IN's *physiological workings*, not an assessment of his agency, his voluntary action, such as 'good job', 'way to go dude', and so on, from the previous segment(s). Such an assessment of accidental/unexpected physiological operations, 'that's a real….', does not attribute agency to IN. Agency is attributed if an IN does what expected by a CG, but no fault is assigned to an IN if unintended NR, rather the unintended NR is treated as a natural, biological response. This echoes the sequence in Fragment 1 where the first burp was treated as too small, a comment on IN's physiological production.

In this next fragment, Fragment 3, MO is holding the IN up in front of and facing her, under the IN's arms (OS = older sister).

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01. MO: superc[ali frag ilisticexpialid[o:cious
02. IN: ((g MO - - - - - - - - - - - - - ))
03. OS:       [mom sto::p ((exasperatedly))
04. MO:                                  [((lifts IN))                ACT-ON
05. IN:                                  [smile, move arms))          REACT/INTENDED
06. MO: he liked that wo;rd . °d'ya like°  [that wo::rd
07. IN:                                  [eh uh
08. MO: ye:ah ((heard 07 as 'yea'))                                   CLOSE
09.    (1.0)
10. MO: say mama
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In 01, MO is singing a song from a popular movie to IN. The older sister, OS (off camera) wants MO to stop, 'mom sto:p', delivered with an exasperated 'not this song again' intonation. As MO stresses the 'do' syllable in 01, she simultaneously acts on IN by lifting him a couple of inches, bringing about a smile and arm waving, a more socially acceptable NR than in the previous two fragments (burp, flatus). The first part of turn 06 is MO's response to OS, providing a rationale for MO singing that particular song. The whispered baby-talk question in the latter part of turn 06 is directed to IN, requesting confirmation if IN does indeed like that word. While asking, IN overlaps MO's question with 'eh uh', in the exact overlap position an adult would overlap, since an adult having been provided adequate grammatical and content resources with '°d'ya *li*ke°', projected the question. The question until the point of overlap °d'ya *li*ke° , projects its completion for an adult, 'that wo::rd'. This is possible especially following the initial statement at the beginning of 06, he *like*d that wo;rd. But of course, IN cannot understand the question. However, MO in 08 embeds the IN's 'eh uh', and accepts it by reformulating what she took 'eh uh'

as, that is a positive response to MO's query, ye:ah and does so as a response-turn to her question. This sequence is akin to humans talking to both INs and certain pets. With line 08, MO closes the sequence.

In Fragment 4, FA is videotaping the IN for the IN's grandparents, to demonstrate to them that the IN, who has just learned to drink from a bottle, can actually do so. Also please note that the FA entitled this video 'Learning to grab bottle'. His focus aids our understanding of this sequence. The three-part sequence seems to be default in IN/CG maybe because of training? Similar to education?

Previous to turn 01, FA is sitting behind and holding camera, with IN in his lap, facing FA. FA is holding a bottle.

01.	FA:	[*there* we go(.)now .hhh	[look at this ahh ah	ACT-ON
01.	FA:		[((shows b to IN))	ACT-ON
03.	IN:	[((g to cam/FA - - -	[g, body to b))	REACT/intended
04.	FA:	[oh:: oh!(.) [what's *this*? .hh	[what's *this*	CLOSE/ACT-ON
05.	FA:	((b out of IN's reach - - -	[b to IN -))	ACT-ON
06.	IN:	[((g - - - [g-reaching	[g-grabs b))	REACT/intended
07.	FA:	[ooo yup(.)very *go*::od ((accept and assess))		CLOSE
08.	IN:	((holding b in lap with help of FA))		

The first part of line 01, '*the*re we go', is FA's self-talk, marking his accomplishment of prepping the bottle for IN. Followed by an in-breath, '.hhh', projecting some new activity, initiated by the next part of this turn, 'look at this'. FA's overlapping non-verbal acting-on of 02, holding the bottle within IN's field of vision, enticing IN but not giving him the bottle. FA does so in such a manner as to exaggerate the IN's natural reactions for the benefit of the grandparents, the target audience, to whom FA wishes to show that IN's bottle grabbing and drinking skills 'have progressed' (FA's words). FA holds the bottle teasingly, just out of IN's reach to accomplish the demonstration.

In 03, we have IN's NR to the bottle presentation: IN orients his gaze and body to the bottle while reaching. IN has experience with the bottle, knows it contains food. In 04, FA deploys an acceptance token, 'oh::', as he moves the bottle towards the IN, then a teasing, 'oh!', as he abruptly stops the movement of the bottle towards the IN, as the IN continues to reach. Doing so closes the first incipient sequence. FA keeps bottle out of IN's reach, the goal of the video, 'grabbing the bottle' not occasioning any positive assessment.

At the end of 04, FA initiates the next sequence by deploying known-answer wh-questions, commonly used in IN/CG and educational interaction, and of that with pets, and with an overlapping non-contact acting-on, 'giving bottle to IN' on the second 'what's *thi*s'.

The question repetition, with an intervening in-breath, '.hh', a common interactional device deployed in adult/adult interaction to make a recipient account-

able for not answering the first question. IN reached for the bottle during the first question, and had not yet adequately responded to FA's question (by grabbing, an NR). Here FA controlled the duration of IN's NR, his 'grabbing', again for the benefit of IN's grandparent's video viewing. Since a linguistic response turn cannot be forthcoming from the IN, FA accepts IN's grabbing at the end of line 06, as a legitimate response turn to his questions. FA's acceptance of IN's 'action' is demonstrated by his acceptance token, 'ooo yup', followed by a positive assessment of IN's NR, 'very *go*::od', denoting IN's doing the correct response (grabbing) to FA's question.

In Fragment 5, lines 09-11, with the same participants, a few seconds later in Fragment 4, while IN is lightly holding the bottle after his grab, FA adjusts the bottle to an upright, drinking position, very close to (yet not touching) the IN's mouth (again, acting-on without physical contact), again FA is acting teasingly, attempting to induce the IN's sucking response.

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09. FA: ((Present b upright to infant))                              ACT-ON
10. IN: [((reaches bh,  [grabs b, moves to mouth  [((sucks))         REACT/intended
11. FA: [ah::::::::     [ope!                     [yep uhm yu:m:     CLOSE
```

In lines 09-11 of Fragment 5, we have a recycling of the same three-part sequence (act-on, react, close), with slight variation, of lines 01-08. In 10, the IN naturally reacts to the FA's upright bottle presentation in line 09, by reaching with both hands, and as he does so, FA accepts this reaction with the first part of line 11 with an 'ah::::::::'. Getting the bottle to the IN's mouth, the goal of this sequence, was an intentionally drawn-out process, again for the benefit of non-co-present grandparents. While FA and IN collaboratively move the bottle to the IN's mouth, it slips from INs hands, occasioning FA to provide a surprise marker for this event, 'ope!' (a variant of 'oop!'). At the end of turn 11, closing the sequence, FA closes with a positive assessment, 'yep' (that's (sucking bottle now) correct), followed by 'yu:m', marking INs natural accomplishment of putting bottle into mouth and beginning to suck.

Thus far, acting on IN differs from that noted by Hacker, since all of his examples included touching (cite). In this fragment, FA induces IN's NRs (grabbing and sucking) by presenting the bottle to IN, certain that IN would react so. Closing was a complex affair consisting of an acceptance and assessment.

In Fragment 6, a group of adults are sitting in front of an IN, who is lying face up on a sofa. The father FA is in the midst of attempting to induce a positive response from the IN.

In Fragment 6, the IN reacts in a manner structurally similar to Fragment 1, where the IN was *caused* to burp. Though burping an infant is done for health reasons, to prevent gas pain, and inducing laughter is playing with an infant, a sequence is created regardless.

01. FA:	still *see* us ((to cameraperson over FA's left shoulder))	
02. FA:	y:e:h! ((gravelly voice, moves face quickly towards IN))	ACT-ON
03. IN:	((laugh = spit up))	REACT
04. FA:	((pulls back, hand over mouth, laughs)) ha (14 times)	CLOSE
05. FA:	video on ((orients gaze to cameraperson)	
06. FA:	y:e:a! ((gravelly, try to induce NR))	ACT-ON
07. IN:	((laugh))	REACT
08. FA:	y:e:a! ((gravelly, try to induce NR))	ACT-ON
	((1.'yea'-2.((laugh)) pair continues 19 times, for the next 1:10 without closing))	

Line 01 constitutes a confirmation question to the cameraperson. In 02, FA initiates the sequence by attempting to induce a positive NR (laugh or smile) from the IN by saying 'y:e:a!' in an exaggerated gravelly voice, while simultaneously quickly moving his face directly in front of the IN's. In the beginning of 03, IN seems to respond with a laugh, or an imitation (both NRs) of FA's ''y:e:a!', but then immediately follows the imitation/laugh with a spit-up, an unintended NR. This occasions FA's multimodal surprise tokens in 04, ((pulls back, hand over mouth, laughs)), followed by a 'laugh-at' (14 iterations), and ends turn 04 with a verbal check, 'video on' (to the cameraperson), to confirm that the spit-up was indeed captured on video, as he directs his gaze to the cameraperson. FA then reinitiates a new same-sequence in 05 employing the same device 'y:e:a!', and received the same positive NR, a laugh, this time without the spit-up, and does so for 19 more y:e:a! + ((smile)) two-turn pairs, without closing, until the video stops.

In Fragment 7, we also have an unexpected NR, a spit-up. And the sequence is also based on handling a contingency as well.

01. MO:	↑number↑ o::ne ((=best, lifts IN's lt arm))	ACT-ON
02.	(3.0)	
03. IN:	((spit-up))	REACT/UNINTENDED
04. MO:	.hoo ((suprised))ha ha ha ha ha ha	CLOSE
05. FA:	oh:: I go::t it (.)((on camera)) ye::s:: ((victoriously))	CLOSE
06. MO:	((laugh, reaches to right for towel)) its like a *po:*ol in my *la*p	
07. FA:	heh *heh* heh	

In 01, MO utters a very high pitched, '↑number o::ne↑' (as in 'we are number one'), simultaneously lifting IN's left arm to coordinate with its lexical affiliate attempting to elicit a reaction. The three-second (3.0) pause of line 02 belongs to the IN, since MO completed the prior turn and awaits IN's response. The pause is followed by the IN's spit-up in 03, an unintended NR. Though unintended, FA and MO embedded line 03 in the sequence as an incipient turn. In MO's orientation to the spit-up of line 03, she first offered an inbreathed surprise token, '.hoo', followed by a laugh-at, similar to the closing of Fragment 6, above, where the NR was also

an unintended spit-up. In 05, FA orients to the videotaping, announcing that he 'got it' (the spit-up) on video, and simultaneously closes his turn and the sequence (capturing spit-up) with a victorious 'ye::s::'. MO and FA then continue onto next sequence with 06 and 07.

The content of sequences is varied yet patterned even with simple NRs as interactional devices. In the next fragment, Fragment 8, a premature IN is in hospital with MO, cannula inserted into IN's left nostril. Not caring about spit-up, IN as patient

01. IN:	((drinking b, expresses discomfort, writhing body))	REACT
02. MO:	((pulls b out of IN's mouth))	ACT-ON/REACT
03. IN:	((spit-up))	REACT/not intended
04. MO:	wo::w: ((assess, MO checks liquid left in b))	CLOSE
05. MO:	this bottle ↑*goo*:d (.)that's a goo:d gir::l=*big* girl	CLOSE
06. MO:	((wipes IN's face))	
07. MO:	((inserts b))	ACT-ON
08. MO:	°this bottle good°(.)little more	

Finishing the bottle is more important than spit-up. MO wanted to accentuate the positive by verbally ignoring the spit-up. MO wiped the spit-up.

This fragment is a bit different than the previous one in that it is initiated by the IN's NR, which occasions MO's acting-on in line 02. Since IN is ill (premature) it is essential that IN drink from the bottle. IN lies in front of MO, who is out of frame to the left. Here MO acts on IN in 02, who, in line 01, reacts to some internal physiological state by expressing discomfort, writhing body plus uncomfortable face, which occasions a sequence initiated by the IN. Thus either an IN or a CG can initiate a non-CA-sequence, a train of events that precedes and sets the stage for a possible CA-sequence. If IN does what is intended by CG, IN gets a positive assessment.

IN then reacts to possibly the same internal state of line 01 by spitting up in 03, a reaction (to IN's internal state) MO attempted to prevent by acting-on (removing bottle). Turn 04 is an exceptionally gentle consoling/assessing 'wo::ww', as would be said to a hospital patient, not as a surprise token to the IN's spit-up as in fragment 7. Rather, 'wo::ww' is a device that displays encouragement, through an exaggerated positive assessment of IN's achievement (as if) for finishing most of the bottle, as well as expressing concern with the fragility of IN's condition. Additionally, positively assessing IN's action of drinking 'that's a goo:d gir::l' and her maturity, '*big* girl', are especially relevant in this context, since the IN is premature and still in hospital. MO closes the sequence with lines 04 and 05, and opens a new sequence with these assessments. The incipient sequence here is initiated by IN's reaction to seeming discomfort (line 01, writhing body), followed by MO acting on IN by removing bottle, and the IN's upgraded reaction in 03 (spit-up), and finally the closing in lines 04 and 05.

Fragment 9 is longer than the previous fragments, and contains multiple interconnected phenomena. It is the MO's first attempt to feed solid food (baby cereal) to the IN.

Previous to line 01, IN is sitting in a highchair in front of both MO and FA. IN is minimally engaged with them. MO in line 01, in initiating her right and obligation as MO, to train IN to eat solid food through acting on the IN. While MO begins feeding in line 01, IN is gazing expectantly at MO's hand, manifesting a neutral face, as in Fragment 4, where IN is gazing at the camera, a common phenomenon in IN/CG, seemingly waiting for CG, also common IN behavior.

01. MO:	((food from bowl and spoon into and out of IN's mouth))	ACT-ON
02. IN:	hup *kkke* ((rejection/disgusted face)) *he*=	REACT
03. MO:	[↑*oo*↓h ((slight surprise and disappointment))	CLOSE
04. MO:	[((rh+lh reaches for bib and wipes mouth-w/rh))	CLOSE
05. IN:	[=he kehe$^{h\cdot g}$ kehe $^{h\cdot g}$ kehe $^{h\cdot g\ h\cdot g}$	IGNORE

With line 01, MO orients to IN's readiness, and initiates her plan to train IN. MO acts on IN by scooping some food from the bowl, and inserts and pulls the spoon out of IN's mouth. IN in line 02 naturally responds by rejecting the food, first exuding a 'hup', then clearing the back of his mouth of the food with a stressed velar '*kkke'*, finally, spitting out the food with a plosive '*he!'*, reacting further non-vocally with a disgusted face.

IN's negative reaction makes relevant MO's multimodal sequence closing, lines 03 and 04. MO's expression of surprise was done at the initial portion, up-intonation, of the '↑*oo*↓h' device. MO expressed disappointment through the downward intonation towards the end.

With 04, MO closed the sequence while IN continued lightly crying in line 05, reacting less intently than in line 02, manifesting her continuous, yet slightly attenuated discomfort, not understanding the verbal closing.

Next, Fragment 10, a continuation of Fragment 9, is the second attempt at solid-feeding. Here, we see an important variation of the previous sequence.

06. MO:	[((lh lifts bowl, moves it toward IN, rh spoon))	ACT-ON (pre-)
07. IN:	[e:::: ·hh((squeakily crying))	REACT
08. MO:	[((rh spoon into IN's mouth))	ACT-ON
09. IN:	[re ehe $^{h\cdot h}$ ehe $^{h\cdot h}$ he:::: ehe $^{h\cdot h}$ ehe $^{h\cdot h}$ ehe $^{h\cdot h}$	REACT
10. IN:	ee*AAA* ae $^{h\cdot h}$ he $^{h\cdot h}$ he $^{h\cdot h}$ he $^{h\cdot h}$ he::: =((mouth agape--pained face))	REACT
11. MO:	[((spoon back to bowl))	
12. MO:	[>cant say you *wai*ted for *th*is *huh*<=	CLOSE
13. IN:	=HE: HE $^{h\cdot h}$ HE $^{h\cdot h}$ HE:::: ^{shah} ((Food in))	IGNORES

The first and second attempts at feeding were built of the same basic three-part sequence, however in the second attempt, IN displays an expectation of discomfort as the spoon moves toward him, displaying discomfort *before* MO can act on him, transforming 06 into an acting-on, a trouble source (Schegloff, 2007, pp. 217-218), in this case the trouble is discomfort, and the first turn of the three-part incipient sequence. To display his expectance, IN reacts to 06 with a squeaky cry, 'e::::', a second-generation reaction, in that this NR is grounded in the discomfort of the previous sequence. In doing so, IN sees the preparation *as* an act-on, and displays his *understanding* of what he expects (discomfort) to be done through this incipient sequence. The IN communicates through his NR in line 07 that he has learned something from his earlier experience. At the end of line 07, with an inbreath, '·hh', he physiologically projects his next NR in line 09, a more intense cry, *before* MO puts food into his mouth.

In line 08, MO again non-verbally acts on IN, and brings about an NR, upgraded crying (relative to 07). In line 09, IN does not spit out the food as he did in the previous fragment. Thus, line 09 can be seen as a less intense and acclimated response to the first food insertion, the IN can possibly be seen as becoming a more mature member, a fact important to the succeeding turns.

With line 11, MO returns the spoon to the bowl, while saying empathetically in 12, '>can't say you *wai*ted for *th*is *hu*h<=', grafting language onto IN's sensation (painful experience, NR).

In 13, IN upgrades his cry, ignoring the MO's verbal closing.

In the final fragment 11, MO has abandoned solid feeding, and has resorted to the bottle. IN hungrily takes the bottle, but too enthusiastically for MO.

37.	IN:	[he^{h}·^{h} ru^{h}·^{h} he: ((satisfiedly, intently-sucking, eyes wide))	OCCASION
38.	CG:	[*nn*↓nn: ((no no)) be *care*[ful ((drinking too fast))	ACT-on
39.	CG:	[((removes bottle [((bottle on highchair table))	ACT-ON
40.	IN:	((gaze follows bottle)) [*H*EH:((pleadingly))	REACT/OCCASION
41.	CG:	((picks up bottle)) ACTION	
42.	IN:	[*h*eh:	
43.	CG:	[*o*k ↑*o* [k ((see prior as plea))	ACT-ON
44.	CG:	[((reinserts bottle))	ACT-ON
45.	IN:	((accepts b, gaze on b-nasal sucking sounds))	REACT
46.	CG:	[*th*at's *for* the *bir*:ds(.)*hu*:h ((empathetically))	CLOSE

Line 38, 'nn↓nn' (no no) was occasioned by 37, a sanctioning move occasioned by the IN's overly intense sucking in 37, which, if continued, may have caused gas or choking. IN's line 37 occasions the MO's non-verbal acting-on in 39. After MO acts on IN by removing the bottle, IN's gaze, line 40, follows it, until the MO places it on the highchair table. IN sees this move as closing the bottle-feeding sequence, which brings about a loud pleading, line 40, '*H*EH:'. Line 41 demonstrates that MO hears the '*H*EH:' as a plea, since she returns the bottle to IN in time, with a resigned '*o*k

↑*o*k', a verbal affiliate provided with a response the IN could understand, resulting in a more attenuated plea '*h*eh:' and the returning of the bottle (line 44).

In line 45, IN accepts CG's move of 44, drinking quietly, contentedly.

In line 46, while adjusting IN's bib, MO utters, '*tha*t's *fo*r the *bi*r:ds(.) *hu*:h' (that was a waste of time (.) wasn't it). Through this turn, MO linguistically closes the sequence by grammatically distancing both herself and IN from the solid-feeding. '*Tha*t's' is a distal proform that ties to the previous feeding, demonstrating MO's understanding of IN's negative orientation (through NRs) of the solid-feeding attempts.

MO again, as in previous fragments, does not hold IN accountable for not responding to 45, again, this helps to characterize this interaction as a special type (non-CA) of interaction.

Discussion/conclusions

I have attempted to demonstrate my contention that IN/CG interaction is indeed just that, a legitimate form of social interaction, comprised of well-ordered, predictable, regular yet adaptable (context free as well as context dependent) sequences between two members of society, two persons. Additionally, like all social interaction, by definition it was organized through generating and deploying turns or being *seen as* doing so, fostering communication and creating social order. Through their mature abilities the CGs organized all of the sequences cooperatively with the INs, embedding all of the IN's behaviors as actions/turns. Thus, the INs and CGs together produced and reproduced order, regularities; without the benefit of spoken language or any interactional experience on the part of one member. INs' NRs employed by CGs to co-construct sequences marked the (human) potential for creating more mature social members and complimentarily, more complex sequences. Thus, it is not that, as Wittgenstein implied about the language of sensation, that NRs are directly replaced by language, but rather NRs initially function as INs' resources to communicate, elicit CG language, allow initiation into and continuance of social interaction.

In a general but important sense, participants ordered interaction by employing interactional devices in a similar manner to that between more mature members: Each CG action (acting-on) or IN reaction (NR) provided an interactional environment for each other, and each phenomenon (CGs turn and IN's reaction) had both retrospective and prospective interactional implications as in adult/adult interaction. The IN/CG interaction thus achieved social order, largely through the CG's acting on INs, and bringing about their NRs and the CG's responses to the NRs as designed for the IN by experienced social members. Recipient design in adult/adult interaction means designing actions that display an orientation sensitive to another person. INs cannot be said to have designed their turns in the CA sense, rather they largely (re)acted to their immediate context, while,

again, CG viewed those NRs as turns, and thus implicitly incorporated IN into the interaction as a member.

Though one member was not able to speak, both were able to co-communicate. IN/CG interaction demonstrated the co-construction of order in each case, an order that transcended all cases, act-on, NR, close. This research demonstrated that the relation of that order is directly implicated in INs' NRs. NRs and CGs treatment of them as actions in a more extended view may be seen as grounding sociality and thus implicitly, more advanced communication and cognition. Neither is both necessary and sufficient to ground sociality.

In all cases, INs were exposed to IN/CG interaction order maintained through CG turn-taking, co-constructing the three-part sequence and its variants. Notably important was the CGs' acting *as if* NRs were turns of some kind.

The CGs acted on INs, engendering and later acknowledging the INs' contributions to the interactions. In doing so the CGs created opportunities (interactional slots) for INs to contribute turns, through the only resource INs possessed, their NRs, which were demonstrated to be massively implicated in and essential to the co-construction of IN/CG interactional sequences. The INs contributed largely through 'providing' NRs, as a response brought about by the CGs' actings-on. These incipient adjacency pairs (acting-on + NR) may be essential to becoming a more mature member, since "…the [CA] adjacency pair is the prime resource in conversation [interaction] for getting something to happen, because it provides a determinate *place* for it to happen – next. (Schegloff, 2007, p. 264, emphasis in original, brackets added). The CGs acting on INs and bringing about their NRs supports the related claim that "Doing a relevant SPP [second pair part] is the prime way a recipient of a prior turn can show their understanding [interpretation] of what the prior turn was doing and what it made relevant to be done next, and thereby grounds that turn's efficiency as an action." (Schegloff, 2007, p. 252, brackets added).

To be social and communicative, order (turn-taking, sequencing) is essential. INs' NRs, their only interactive resource, not gestural or linguistic abilities, grounded communication and sociality, and in Goodwin's words, functioned as a prerequisite, chronologically prior, for elaboration of more mature representational systems of both gesture and spoken language (Goodwin, 2003, p. 110). We also find concurrence with Goodwin from a completely different literature source, "The child does not learn to respond to his mother's [CG's] behavior as to a human being. He responds [NRs] – and *later learns [uses] a language*. Those [biological] responses might have been different, as they are in cases of autism. But had they generally been different, the human forms of life as we know them would not have arisen" (Hacker, 1993/98, p. 123, emphasis and brackets added).

Additionally, as Goodwin (2003) astutely noted, when analyzing interaction we are not examining actions in isolation, but rather a "multiparty participation framework – organized to constitute a common *focus of attention*." (p. 102, emphasis added). In this paper, IN's NRs also served as resources to focus attention to accom-

plish the CGs' goals. However, since turns (not turn-taking) are social conventions (Wilson, 1993, p. 23), they are rule-guided, IN/CG interaction constituted a special (non-adult) case, but the INs were seen as *conforming to* (not following) certain rules through their natural reactive capacities. For example, INs were not able to orient to verbal sequence closings. For example in Fragment 9, the IN continued to cry through the (attempted) closing (line 05),

03. MO:	[↑oo↓h ((slight surprise and disappointment))	CLOSE
04. MO:	[((rh+lh reaches for bib and wipes mouth-w/rh))	CLOSE
05. IN:	[=he kehe$^{h\cdot g}$ kehe $^{h\cdot g}$ kehe $^{h\cdot g\ h\cdot g}$	IGNORE

yet was not held accountable, demonstrating the possibility that interaction through NRs *precedes and grounds* the following of such mature, conventional, communicative rules.

Additionally, it has been demonstrated that turn-taking, which grounds communication, sociality, and so on, is itself grounded in INs' biology (NRs, ability to sense, move, and so on) , not in preexisting social schemas, interaction machines, innate grammar, language for thought, and so on. Thus, INs may be viewed as being implicitly (biologically) social, in the sense that their NRs grounded their sociality.

We may conclude that if turn-taking organization forms a part of all societies (Schegloff 1992, 2007), it then appears that it must be preceded by incipient turn-taking (IN/CG interaction), the earliest form of interaction, which certainly occurs in all societies, though of course with cultural variations.

'Act-on + NR + Closing' was the basic incipient three-part sequence found. Some sequence types are strongly tied to activities and settings. This three-part sequence is strongly tied to, or more directly, can characterize IN/CG interaction. The CGs' taking care and training via their actings-on, the INs' natural response to such care and training, and the final closing, marked the move to the next sequence.

CGs displayed many modes (verbal and non-verbal) of acting on INs, and complimentarily INs displayed many ways to naturally react, creating varied yet predictable sequences. The CGs' frequent acting on INs marks IN/CG as different from adult/adult interaction, and was a feature representative of all fragments both here and in a larger as yet unanalyzed data set.

The *acting-on* device was the prerogative of CGs, deployed to care for and train INs. Actings-on were not only non-verbal, contact gestures as claimed by Hacker (2007, see above). CGs *used* verbal actions, for example questions at times accompanied by gestural affiliates, such as enticing IN with a bottle, creating multimodal actings-on. At these times INs were acted on, but not touched. For example, in the first fragment, Fragment 4, in line 5 'look at this' the IN of course could not respond to the *verbal* directive, rather it was the gestural affiliate, the non-verbal, non-contact acting-on that brought about the IN's NR, creating what was seen by CGs to be the next turn, within a (turn-taking) framework. Additionally in Frag-

ment 10, where the IN responded to MO preparing the gruel for the second time, we saw IN display discomfort prior to the actual (spoon insertion) discomforting move of the CG. It was in these and other sequences that INs were regularly exposed to language, culture, sociality, and so on, directly related to the CGs' acting-on, where the INs' reactions were accepted as correct (normal) and thus validated, through positive assessments, and embedded. Training in particular, or interaction in general, would not have been possible without the INs' ability to naturally react.

In the most general terms, the three-part sequence found here is akin to the well-known IRE interactional sequence (Initiation-Response-Evaluation), (Sinclair and Coulthard, 1975).

The IRE sequence is a form of "teacher talk", emblematic of early educational interaction. Hall and Walsh (2002) have advanced a strong but not unreasonable claim that this type of sequence "…typifies the discourse of western schooling, from kindergarten to the university." (p. 188). If the relationship to the three-part sequence found here holds, the IRE sequence would appear to have very early ontogenetic origins. Hall and Walsh also report that the IRE sequence is often viewed as limiting students' interaction and not facilitating complex interactions and meaning exchange. The sequence found here in a sense limited the INs' NRs (so in a sense NRs were designed, though not by IN but by evolutionary processes) to certain types of turns through the CGs' actings-on, but also served as a vehicle for the INs to employ all of their current abilities. In relation to the IRE sequence, Schegloff (2007, p. 22, note) says Sinclair and Coulthard (1975) take the minimal size of an interactional sequence to be three turns, "…a view which may reflect its origin in the study of classroom interaction." For Schegloff, in conversation, the minimum sequence is comprised of two turns, and a third turn is an expansion. Here, in IN/CG the incipient sequence appears to consist of three parts, but IN/CG interaction may be a variety of training, or rather training (schooling) maybe be a variety of the three-part sequence that was found here.

It is Hacker's contention, and was seen here, that training antedates understanding (Hacker, 1993/98, p. 112). To provide more detail for Hacker's claim, training of any type, including that found in the IN/CG fragments, requires an interactional framework such as incipient turn-taking. Thus we can now more specifically restate Hacker's claim that training *through incipient turn-taking* must antedate CA (mature) turn-taking and understanding. Therefore, a more general conclusion is obtained: It was not necessary to invoke understanding in the traditional sense, as a cognitive internal, neural or mental process, as an inner ability to foster communication, sociality, and so on.

As we saw, all INs' NRs were not planned by the CGs. At times, the CGs did not expect certain NRs (e.g. spit-ups and flatus), but expected or not, the CGs handled all of these contingencies by embedding them into the interaction, thus creating regular incipient sequences; in a phrase, exhibiting sociality. However, the closing thirds of the sequences were highly variable, and this is as expected in adult/adult

interaction Schegloff (2007). In some cases, as mentioned, the closing third actually did not close for the IN, since some continued beyond the closing-third turn, especially doing their expression of pain/discomfort, while the CG moved on to the next sequence. All closings were verbal, and CGs merely ignored INs who did not accept the verbal closing simply by moving on to a new sequence.

As has been established, part of the system of rules for socially interacting with INs is the CGs' deployment of appropriately designed turns: acting on INs, not holding INs accountable, and framing the interaction for a particular CG goal. The CGs' designing turns for interaction with INs presented the INs with appropriate interactional opportunities and various types of (nonsocial, biological) obligation to (re)act. INs not responding with an appropriate NR could initiate a different type of accountability, for example, medical accountability, for example an IN never smiling, or reaching for the bottle, and so on, could indicate a serious medical condition.

One area where adult/adult interaction differs from IN/CG is that in the latter, INs were not held accountable when the adult/adult–like interactional occasions arose. For example, if a normal (non-ill) adult had burped in public, that adult would have been held accountable in some manner for doing so. INs, as they socially mature through interacting with CGs, will gradually come to be held accountable for their (non)actions, as they also come to be more agentful (willful). In doing so, INs concomitantly become more complete persons, and their more mature behaviors come to be judged as responsible (or not) social actions, which will, again, be judged as such through the framework of interaction.

That exposure and incorporation of INs in interaction ground the INs' coming to understand in at least one sequence (IN pleading for bottle) and thus grounding their becoming able to participate in more complex communicative activities. However, we did see the appearance of nascent forms of understanding (ability to do) through the CGs' application of mature turn-taking. In Fragment 11, the IN demonstrated that he understood that feeding was ending, and pleaded for more milk. This indicated again that an infant's ability to participate in interaction and thus communication, appears to grow out of its biological capacities rather than any apriori linguistic or cognitive abilities.

Normal INs will mature, they will, through turn-taking, increasingly come to demonstrate their understanding, their social and communicative abilities, rather than merely naturally reacting and conforming to turn-taking rules as they have done and *must* do initially (Berducci, 2004).

Further, we saw in many cases that CGs implicitly ascribed agency to INs through their deploying of positive assessments of INs' NRs: 'thata boy', 'way to go dude', 'yep', 'good girl', and so on. Actions are assessables. If assessments (positive or negative) are deployed, they can serve as an ascription of agency, intentionality and personhood. Ascription of particular abilities rests on behavioral criteria (Hacker, 2007/8, p. 288). I would add that it rests on turn position in sequence, as well as behavioral criteria. The ascriptions of being able to do (positive assessments)

in the IN/CG data, when they occurred, always occurred in a turn subsequent to the NR. Criteria to ascribe psychological predicates [such as agency] consist in what people do (Hacker, 2007, p. 289), and further, "…to have a mind [will, agency] is to have a certain range of abilities…" (p, 20 Hacker, 2007/8), all, as we have seen, recognized as such by an interlocutor through turn-taking. To paraphrase Hacker, it's not because we are agents that certain predicates apply to us, but rather because such predicates apply to us we can be said to have agency. The criteria for the application of those terms ('way to go dude' etc.) to INs are because such predicates apply to INs' behaviors (in cases where the intended NR was 'performed); INs can then be said to have (incipient) agency, because they are seen as agents in such an interaction. Such predicates cannot be applied arbitrarily. Here the criteria for application have been IN's 'doing' an intended NR (intended by a CG), for example, a burp, a laugh, and so on. Thus, it would appear that emergent cognition (agency, mind, will) goes hand-in-hand with emergent interactional abilities.

As predicted by Durkheim's (1938) research, we would have expected to have seen CGs proffer explicit social and linguistic rules to the INs. This was not apparent in any of the cases presented, rather social and linguistic rules were manifest in their interaction, implicitly provided by CGs' acting on INs through taking and ascribing turns to INs. Further, as stated in the introduction, according to the more recent and more relevant work of Wootton (1997), we would have expected the INs to come to be social by "…acting strategically so as *to take account of what has happened* in any given encounter." (p. 4, my emphasis). Rather, in the cases analyzed, we witnessed more elemental phenomena – INs *younger* than the child in Wootton's study came to be more social by being acted on, then naturally reacting and being incorporated into the interaction as a legitimate member through turn-taking.

As claimed in CA, from ordinary adult/adult interaction all other more specialized, institutional forms, courtroom, doctor/patient, teacher/student, and so on are built. Implicit in the analysis of this paper was that from IN/CG interaction, ordinary interaction *must* originate; 'must' because IN/CG interaction (incipient turns) chronologically precedes adult/adult interaction (CA turns). If my claim is correct it would produce the following continuum: IN/CG interaction (incipient CA turns and sequences) → adult/adult ordinary talk (CA turns and sequences) → adult/adult specialized talk (specific types of CA turns and sequences). Thus, emerging out of IN/CG interaction come higher-order, communicative forms. In short, subsequent mature interaction is logically and empirically grounded in previous forms.

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Appendix. Glossary of transcript symbols

[	point of overlap onset
]	point of overlap end
=	no break or gap
(0.0)	elapsed time by tenths of seconds
(·)	a brief pause within or between utterances
::	prolongation of the immediately prior sound
WORD	upper case indicates especially loud sounds relative to the surrounding talk
> <	bracketed material is speeded up, compared to the surrounding talk
< >	bracketed material is slowed down, compared to the surrounding talk
·hhh	in breath, without the dot, 'hhh', an out breath
he$^{h'h}$	superscript 'h', barely audible out breath
↑	higher pitch than surrounding talk
↓	lower pitch than surrounding talk
(( ))	analyst's comments
^{0}whispered^{0}	material between superscripted 'o's, whispered