# "Buffy sings to Cody": A multimodal analysis of mother and pre-lingual-infant question–response sequences

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## Abstract

This study examines how singer-songwriter Buffy Sainte-Marie and her pre-lingual infant son, Cody, engage with each other in the sequential turn-taking process of conversation on a 1978 episode of *Sesame Street*. A multimodal analysis demonstrates that Cody relies on the audible prosodic contours of his mother's questions to provide responses by producing cries and relevant embodied behavior at "transition relevance places" (Sacks et al., 1974). Buffy treats her son's responses to her questions as consequential parts of the interaction, and this in turn supports her son's language socialization. This study contributes to understanding how communication before language can occur through a reliance on prosody and via cries and relevant embodied behavior, and how turn-taking and sequencing can also be scaffolded through prosody and singing, which are ultimately conducive to language socialization.
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## 1. Introduction

Recent multimodal work on childcare and family life has begun to document the ways in which pre-lingual children are capable of engaging in meaningful social interaction (e.g., Kidwell, 2005; Kidwell and Zimmerman, 2007; Lerner and Zimmerman, 2003; Lerner et al., 2011). These researchers and those at the Max Planck Institute research group on Communication Before Language[1] have demonstrated that children who do not yet have the ability to speak can still "read" social interaction by relying on multimodal elements such as eye gaze, body positioning, and various forms of embodied interaction, and can in turn participate meaningfully in interactions through the use of gestures (like points) and actions that are sequentially appropriate. Researchers have also been interested in the role of prosody in caregiver and infant interactions (e.g., Erickson, 2003; Gratier, 2000; Malloch, 2000), although as Esteve-Gibert et al. (2016) acknowledge, the exact role of prosody in caregiver–infant interaction has not been well understood.

Building on this work, this study examines a 1978 *Sesame Street* video of singer–songwriter Buffy Sainte-Marie singing to and asking questions of her pre-lingual son, Cody, while playing in a creek. Following Schieffelin and Ochs' (1986) conceptualization of "language socialization," and considering a related process of what I call "music socialization," I expand on previous work on spoken turn-taking norms of young children (e.g., Ervin-Tripp, 1978; Garvey and Berninger, 1981; Iwamura, 1980), analyzing how a pre-lingual infant relies on the audible prosodic contours and cadence of his mother's questions to take sequentially appropriate turns by producing cries and relevant embodied

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[1] http://www.mpi.nl/departments/independent-research-groups/communication-before-language.

behavior at ''transition relevance places'' (Sacks et al., 1974) or occasions at which turn exchange occurs among interlocutors. In this multimodal analysis, I also demonstrate how Buffy treats her son's responses to her questions as consequential parts of the interaction, and how these processes support Cody's language and music socialization.

## 2. Communication before language

### 2.1. Multimodal conversational sequence and embodied interaction among pre-lingual infants

Conversational talk is turn-by-turn and contains sequences such as the basic two-part question–response sequence (Schegloff, 2007), which require an alternation between speakers. The originally described turn-taking system in conversation is conceived of as having no overlap and no gap between turns (Sacks et al., 1974). Rather than continuing to use the spoken turn as a unit, Goodwin (2011) expands on Goffman's (1981) term ''the move'' as the basic unit within communicative action sequences. ''The move'' is defined as ''a unit contribution of communicative behavior constituting a single, complete pushing forward of an interactional sequence by making some relevant social action recognizable'' (Enfield, 2011: 61). A particularly relevant analysis of such meaningful interaction is Goodwin's (2011) study of the interactions of Chil, an aphasic man with a three-word vocabulary, who uses gesture and prosodic variants of the word ''no'' at appropriate transition relevance places in question–response sequences to communicate meaningfully. Goodwin and Cekaite (2013) also use the move to examine the intertwined syntactic, prosodic, and embodied shape of directive response sequences among parents getting their children ready for bed. Using the move as the basic unit, then, encourages analytical attention to the ''multimodal semiotic ecology'' (see Goodwin, 2010: 391; Goodwin, 2013; Erickson, 2011: 181) which includes language structure, prosody, and embodied behavior, within which language is embedded and interwoven.

As Streeck, C. Goodwin, and LeBaron write in the introduction to their edited volume on embodied interaction, ''multimodality has become a concern within more traditional fields such as childhood and family communication'' (2011:11). Recent studies that have shown that even children who have not yet acquired the ability to speak are ''capable of rather nuanced and sophisticated forms of social interaction'' (Streeck et al., 2011: 12); they produce recognizable courses of action and show that they expect their actions to be recognized. Lerner and Zimmerman (2003) show how prelingual infants use two distinct gaze patterns of their caregivers, ''the look,'' or a fixed stare, and ''the mere look,'' a passing glance, and found that the children would continue their behavior if given a mere look, but stop what they were doing when they were given ''the look.'' In the same volume, Lerner et al. (2011) describe how pre-lingual children who have not yet acquired the ability to speak still manage to engage in interaction by relying on visible embodied behavior. The researchers parse the process of a caregiver serving food to a child into sequential structures where possibilities for participation emerge systematically. They find that one child in particular actively uses the visible embodied behavior of the caregiver and the child being fed in order to determine relevant moments (''task transition spaces'') in which to produce her own actions (points) to be interpreted by others. Thus the researchers show that this infant is able to attempt to join an activity in which she is not a ratified participant. In sum, pre-lingual infants have been shown to have the ability to interpret eye gaze, body positioning, gestures, and can communicate with gestures such as pointing.

### 2.2. Language socialization, prosody, timing, and music in caregiver–child interaction

Schieffelin and Ochs (1986) describe language socialization as an interactive process that ''begins at the moment of social contact in the life of a human being'' (164), with the stated goal of studying language socialization being ''the understanding of how persons become competent members of social groups and the role of language in this process'' (167); language can be studied as a medium or tool in this process, and the acquisition of the appropriate uses of language can be studied as part of acquiring social competence. From this perspective, processes of language acquisition and of socialization are integrated, with both processes affecting each other. Schieffelin and Ochs (1986) find that children usually acquire linguistic and social knowledge in either predominately dyadic or multi-party interactions, with American White Middle Class (AWMC) children being exposed to primarily dyadic verbal interactions. They suggest that the communicative environment is an important variable in children's understandings of social identities, and that turn-taking in conversation is one important dimension of this communicative environment.

Important to the social acquisition of turn-taking is prosody and musicality of speech, which play an important role in caregiver–child interaction, especially regarding marking transition relevance places. Magyari et al. (2014) have found evidence of a neuronal correlate of turn-end anticipation using EEG (electroencephalogram) and an experimental task with conversational stimuli, suggesting that prosodic cues provide listeners with information that enables them to anticipate turn-ends and transition relevance places. Fernald (1992) and Locke (1996) describe how early mother–infant interactions provide acquaintance with the prosodic features of language, as well as exposure to the prototypical and meaningful sounds and patterns of spoken language. Esteve-Gibert et al. (2016) found that 12-month-old infants rely on both prosody and gesture shape to make pragmatic inferences. Malloch (2000) uses sound spectrograph prints to identify cadence-like

patterns in mother–infant speech, showing how a mother speaks to her infant in brief bursts of about 1.5 s in duration, which is argued to demonstrate the origins of turn-taking in conversation. Gratier (2000) also demonstrates the existence of a regular, cadential "beat" in an instance of vocalizing between another mother and infant. Like Malloch's example, here the rate of the successive "beats" is roughly four in every 10 s. Similar cadential timing phenomena have been noted in a series of studies by Beebe et al. (1985). According to Jaffe et al. (2001), even neonates can perceive time and temporal sequence, including durations of intervals lasting seconds and fractions of seconds in their own and in others' behavior.

Infants can respond to variations in frequency, intensity, duration, and temporal or spatial patterning of sounds (Papoušek and Papoušek, 1981: 171), that is, to emotional–intonational aspects of the human voice (Locke, 1993: 369, 416; Shore, 1994). Erickson (2015) notes that timing patterns between mothers and infants have been reported over the past thirty years by the research group led by Daniel Stern (e.g. Beebe et al., 1979; Jaffe et al., 2001). By at least two months, infants respond to rhythmically presented facial and body movements as well (Beebe et al., 1982; Trevarthen, 1984, 1995). Beebe et al. (1992) have shown how mothers and infants engage in jointly constructed dyadic interactions where they track the duration of movements in emotionally expressive facial and bodily behaviors, as well as vocal phrases and pauses. Furthermore, recent work (Gratier, 2003; Gratier and Apter-Danon, 2009) shows how this periodicity in speech is flexible, mutually produced by mother and infant. These studies all confirm Bateson's (1975) suggestion that interactions between mothers and infants are "protoconversational."

Especially important to the aural modality is considering the breath group, or the intonation unit, as the basic unit of information in speech (see extended discussions on intonation units in Dubois, 1992 and Chafe, 1994). Erickson defines the breath group as "a strip of speech demarcated by an overall intonational contour and concluded by a slight pause" (2014: 7–8). He notes that as the basic performed unit of oral discourse, the breath group is similar to a phrase in music—a connected vocal "gesture" across time (Erickson, 2015). Pauses between breath groups, or "transition relevance places" (Sacks et al., 1974) or "transition relevance moments," i.e. moments of appropriateness for turn exchange among interlocutors (Erickson, 2015), mark moments of appropriateness for listening response (see the discussions in Erickson and Shultz, 1982; Erickson, 1986, 2004). Within breath groups, the stressed tonal nucleus refers to the syllable that is most prominently marked by an increase in pitch, volume, or both, and often functions to signal new information in the speech stream (Erickson, 2015). Erickson (2015) argues, "the timing organization of speech rhythm provides basic support for the capacity of speech to communicate information within the ongoing conduct of talk" (9), and he also notes that aspects of interaction such as postural orientation, interpersonal distance ("proxemics"), and gaze direction function together with breath groups (sometimes changing at breath group boundaries, sometimes sustaining over successive breath groups across one or more speakers) to contribute to a multimodal semiotic ecology.

Dissanayake (2000) hypothesizes that human music itself originated in such rhythmic, temporally patterned, jointly maintained affiliative interactions between mothers and infants under six months of age, and states that this hypothesis accounts for music's power to coordinate and conjoin individuals, both physically and psychologically. As Erickson (2003) summarizes, the implications of findings like these is that nursery rhymes and songs provide interactional "scaffolding" practice for children's acquisition of speech because "the stress patterns in these rhythmically stylized genres map over the slightly less stylized but nonetheless regular patterns of timing in the conduct of ordinary talk" (16). These works on prosody in mother–infant speech and Erickson's (2003, 2015) comments on the findings indicate that in addition to making use of gaze, body positioning, and gesture in interaction, young pre-lingual children can also rely on the aural modality in order to participate in interaction with their caregivers.

To summarize: pre-lingual infants, through their reliance on a variety of multimodal resources (including gesture, gaze, and movement) are capable of interpreting caregivers' meaning, as well as interacting with their caregivers, with prosody and breath groups possibly helping them to identify transition relevance places. Through situating 'communication before language' in a language socialization perspective, we can examine how caregiver–infant interaction contributes to language socialization. I carry out an analysis of one instance of language/music socialization, showing how, without visual access to his mother, a pre-lingual infant is still able to rely on his mother's prosody and breath groups in order to give vocal (cries) and non-vocal (physical movement) as sequentially appropriate responses to her questions at transition relevance places in the interaction. Furthermore, I demonstrate how the mother treats her child's responses as consequential parts of the interaction, assessing her son's responses to her questions and thus scaffolding her son's language/music socialization.

## 3. Data and methodology

The data analyzed here is a 1.27 min YouTube video clip, titled "Buffy sings to Cody" (1978, *Sesame Street*),[2] which features Canadian–American Cree singer–songwriter and musician Buffy Sainte-Marie interacting with her baby son at a creek. The clip was originally shown as part of the children's television program *Sesame Street* in 1978. Buffy was about

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[2] https://www.youtube.com/watch?v=IhviR0SKEmk.

37 years old in 1978, and she regularly appeared on *Sesame Street* over a five-year period from 1976 to 1981, along with her first son, Dakota Wolfblanket Starchild ("Cody" for short), who appears to be about 7 to 8 months old in this video. According to Buffy, she wanted to teach the show's young viewers that "Indians still exist."[3] In this particular video clip, there is an apparent multimodal richness in the interaction between Buffy and her son, Cody. Originally, I was most interested in the manner in which Buffy sings to her son and incorporates her own movements and those of her son into the song, as well as re-directing him when he starts crying. However, after fine-grained transcription of the singing, talk, and movement that occurs throughout the video, I became much more interested in the behavior of Buffy's son, Cody. While Cody does not speak in this video, he still manages to engage with his mother at several points in a meaningful way, as I discuss in detail below in the analysis section. Finally, I came full circle to see that Buffy's cadence and singing likely scaffold Cody's sequential turn-taking acquisition, and the way she treats Cody's engagement involves ratifying his responses to her questions, ultimately supporting his language and music socialization.

In order to perform a detailed multimodal analysis of the video, I first created a transcript, largely adapting the transcription conventions of Du Bois et al. (2014) in ELAN, with separate tiers for Buffy and Cody's vocal behavior. I then added a tier for "activity" where I marked general embodied activities in the video, such as where both participants get in the water, and what activities are enacted in the water, such as Cody bouncing or splashing, slapping a rock, etc. During this transcription process, in which I attempted to maintain what Chafe (1994) calls intonation units, and Erickson (2015) calls breath units, as the basic unit of speech, I started to see how some of Cody's cries and actions actually fit in moments of transition relevance as second-part pairs to his mother's questions. Thus, I decided to focus on two question–response sequences that occur between Buffy and her son, Cody, closely examining how Cody responds to his mother's questions at appropriate transition relevant places, both vocally and non-vocally. In Cody's precise placement of responses, he demonstrates a grasp of the sequential patterns and timing of the conversational turn-taking system, which I argue may be facilitated by the regular cadential patterning of his mother's singing and spoken breath units and the placement of the tonal nucleus within the breath units. In the analysis, I show how these sequences develop and how Buffy and Cody's methods for producing interpretable action are employed effectively in their back-and-forth interaction. I also describe the evidence that Cody's responses are treated by his mother as relevant to the interaction by analyzing how she responds to them, both vocally and in an embodied manner, ratifying his participation and ensuring that his contributions have an outcome in the interaction.

## 4. Setting the stage

To set the stage for the analysis, I first describe the setting of this interaction and the positioning and activity of the two participants, Buffy and her son, Cody. The video is recorded outdoors at what appears to be a small creek. In the video, Buffy plays with Cody at the creek, singing to him and eventually placing him in the water, and then getting into the water with him. At the beginning of the video, Buffy sits upright on some large rocks next to the creek, with her feet in the water, holding Cody on her lap with both arms around him, so that the two of them are in a nested formation facing both the water and the camera (see Fig. 1.1). The camera is positioned opposite from the pair, capturing their entire bodies as well as a good portion of the environment around them, and throughout the video it continues to slowly zoom in on their interaction. Later on, other cameras from different angles are also utilized, which I mention when they become relevant to the analysis.



Fig. 1.1. Buffy and Cody sit in a nested formation.

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[3] This quote, as well as the general information mentioned here about Buffy, Cody, and their appearances on *Sesame Street* are from http://en.wikipedia.org/wiki/Buffy_Sainte-Marie.

(a)                                        (b)                                        (c)



Fig. 1.2. Cody's eye gaze tracks the movement of his mother's hands. (a) Cody gazes to the left. (b) Cody's gaze shifts. (c) Cody gazes to the right.

When the video starts, Buffy has both arms around Cody, and with her head positioned above his and to his left, touching her right cheek to the left side of his face says ''o:h'' as she bounces him on her knees. She then moves her left arm to hold his left hand, while saying what sounds like ''#its #a #nice #one'' (# is used to indicate uncertain transcription) and Cody's eye gaze tracks the movement of her arm from center position to his left hand (Fig. 1.2a). Then she moves her right arm from the center position to hold his right hand, while saying ''Oh it's a nice day'' and again we can see that Cody's eye gaze shifts from his left hand and tracks the movement of his mother's right arm from the center of his body (Fig. 1.2b) to his right hand (Fig. 1.2c). Thus, from the onset of this interaction Buffy and Cody are in a nested formation with Cody already demonstrating his engagement with his mother's movements across his own body by tracking them with his eye gaze as she takes hold of each of his hands.

Now that Buffy has both of Cody's hands in her own, she initiates the singing activity, providing a kind of ''abstract'' (Labov and Walezky, 1967) for the activity that is about to begin by saying ''Here's your song'', and moving Cody's hands into the air, almost parallel to his ears. She holds them briefly raised in the air as she sings the first word of the song, ''He:'s'' and then moves them down toward his legs as she says ''a:.'' Again, we see Cody's eye gaze here tracking the movement of his mother's (and now of course, his own) hands up and then down, and with this start of the activity, Cody's body is already being orchestrated with a holding gesture and long syllable nucleus. After this introduction to the song, Buffy inhales sharply, and then continues singing, ''jumpy #little bean he's a bouncy machine'' and so on while moving Cody's hands to the rhythm of the song (see the Appendix for the transcript of the entire interaction, including the rest of the song).

## 5. Analysis: question–response sequences

Now to turn to the focus of this analysis – the question–response sequences between Buffy and Cody. Instead of using the visible embodied behavior of his caregiver, as the child does in Lerner et al. (2011), Cody relies on his mother's audible questions and indicates his awareness of appropriate transition relevance places and sequencing by providing his own vocal as well as non-vocal (i.e., relevant embodied movement) responses to his mother's questions.

### 5.1. Cody responds to Buffy's questions with cries

In the first two question–response sequences, I show how Cody responds to his mother's questions at transition relevance places with natural vocal responses – cries, which are appropriated for intentional communication. The first two question–response sequences begin when there is a trouble spot, or what Erickson (p.c.) refers to as a ''stumble'' in the interaction that requires attention – Cody starts crying about 16 s after being lowered into the water, interrupting the cadence of Buffy's song and needless to say, the playful key (Goffman, 1974), or tone, of the interaction.

Previous to Cody crying, at about 12.5 s into the video, while Buffy sings, ''Who's the little baby that I love so much?'' Buffy lowers Cody from her lap into the water in front of her, between her legs, so that the now smiling Cody is only in the water about up to his knees, and while still holding his hands up near his ears, she bounces him in the water to the beat of her singing (See Fig. 1.3a). Initially, Cody is silent as Buffy sings to him and bounces him in the water. At about 26 s there is a shift in cameras – now there is a camera up close on Cody's left side, so that only the upper part of Cody's torso and his mother's head (when she bends forward over him and brings it into the camera shot) are visible. This fortuitous angle makes it possible to see how, after about 16 s in the water (at 28.5 s in the video), Buffy begins to pull Cody's arm back, and Cody's face begins to contort into an unhappy grimace, and he lets out a barely perceptible, short cry (see Fig. 1.3b). Less than a second later he begins to cry aloud, alerting his mother, who is behind him and cannot see his face, to his displeasure.

Initially, as Buffy's head is still over Cody and she does not have visual access to his face, she seems to misinterpret his vocalizing as laughter, looking down at him and smiling while she sings ''Oh Cody-o'' with audible smile voice

(a)                                   (b)                                   (c)



Fig. 1.3. Cody is placed in the water and starts to cry. (a) Cody touches water. (b) Cody grimaces. (c) Cody cries, Buffy smiles.

(see Fig. 1.3c and line 33 of Transcript Excerpt 1.1, below). However, when Buffy moves her head to where she can see Cody's face, she quickly realizes that Cody is actually crying, and while repeating practically the same words of the song, she does so with a noticeable drop in pitch and falling intonation, now elongating her vowels and saying ''O:hh\ Cody-o d: oh'', overlapping with Cody's staccato-like and repetitive crying pattern. It is during this overlap that the regular cadence of the song is thrown off, making this identifiable as a ''trouble spot'' or a ''stumble'' in the interaction that needs to be attended to by Buffy; and so we see Buffy's initiation of a 'redirection' of Cody's crying.

At this point the first question–response sequence unfolds, as shown in Transcript Excerpt 1.1, below. Here we can see how Cody uses high-pitched cries as sequentially appropriate responses to his mother's questions at transition relevance places for intentional communication with his mother.

**Transcript Excerpt 1.1**: Cody responds to Buffy's questions with cries

```
32     CODY;        (SNIFFLE) [heh heh
33     BUFFY;                 [Cody-o <SMILE VOICE>
34     CODY;        he [heh heh heh heh heh/
35     BUFFY;          [O:h\
36                  Cody-o[do:h\
37     CODY;            [heh heh heh [[heh/
38     BUFFY;                        [[What is it\= ((LOW-PITCH))
39                  ((BRINGS ARMS DOWN AROUND CODY, HUGS HIM))
40  →CODY;                                =he: ((HIGH PITCHED))
41     BUFFY;       What is it\ ((SHIFTS TO HIGHER PITCH, BREATHY VOICE))
42  →CODY;        .[he: ((HIGH PITCHED CRY))
43     BUFFY;        [Is it cold?
44                  Let's see
45                  ..Is it cold\ ((KNEE TOUCHES WATER))
```

Buffy's first question to Cody is delivered right after Cody's series of similar ''heh heh heh heh'' cries (line 37), that Buffy has overlapped with, as described above. She asks, in a low pitched ''motherese'' type tone with falling intonation, ''What is it\'' (line 38). As she speaks, she brings her hands, still clasped around Cody's, down and around him, bringing her closer to him and embracing him as she works with him through this ''trouble spot'' in their interaction (see Fig. 1.4). Note that the tonal nucleus of Buffy's question is ''what'', and that this initial placement of tone in the question, along with its



Fig. 1.4. Buffy hugs Cody and asks, ''What is it\'' (line 38).

length as a breath unit, may guide Cody in appropriately placing his response. Here Cody's eyes are closed tightly and he is still not facing his mother, yet he responds to his mother's audible question after she asks it, at a transition relevance place with a long, high-pitched ''he:'' cry (line 40), very different from his previous cries, which were repetitive and in short units together.

We can first see how Buffy treats Cody's response as interactionally relevant in the way that she adjusts her pitch to match the pitch of his cry. Buffy repeats her question in a similar breath unit with the same placement of the tonal nucleus, but now with a markedly higher-pitched and breathier ''What is it\'' (line 41). Thus Buffy adjusts her pitch, which was previously very low, to match Cody's high-pitched response. Cody again responds to his mother's question after she asks it at the transition relevance place with another, longer, wavering high-pitched ''he:'' cry (line 42). This is the second time we can see Cody responding to a question with a cry at a transition relevance place.

### 5.2. Buffy interprets Cody's cries and closes the crying sequence

Next, Buffy interprets Cody's response cries as action to respond to, and ends the crying sequence with a coordinated move of speech and embodied action. Buffy treats Cody's cries as pertinent to the interaction when, overlapping with her son's second high-pitched cry, Buffy asks ''Is it cold? Let's see'' (43–44). Note that in the middle of ''Is it cold'' there is another shift in cameras here, and we are brought back to the original viewpoint of looking at Buffy and Cody from a medium close up camera shot. With the question ''Is it cold?'' Buffy shows that she has interpreted Cody's cries as an indicator that the water is cold; Golinkoff (1983) found that this is a preference of Anglo white middle class (AWMC) caregivers who display ''a keen interest in pursuing what a child could have meant in some unintelligible or incomplete utterance'' (as cited in Schieffelin and Ochs, 1986:173). Furthermore, in discussing the variable of ''communicative accommodation'', Ochs and Schieffelin also comment on ''highly child-centered communication'', characteristic of AWMC caregivers' speech, where the caregiver takes the perspective of the child in talking to and understanding the child, as well as being characterized by child-centered topics, a tendency to accommodate to the child's egocentric behavior, and by a desire to engage the child frequently as a conversational partner (1986:174). Thus we can see how Buffy's verbal interpretation of Cody's cries may relate to previous findings of AWMC caregiver speech, although it is problematic to characterize her as ''Anglo'' and ''white'', because even though she grew up in an adopted white Canadian household, she is of Native American heritage (Stonechild, 2012). This points to how research on caregiver speech can be improved by a more micro focus on ''communities of practice'' (Lave and Wenger, 1991; Eckert, 2000) which Eckert (2006) defines as a ''collection of people who engage on an ongoing basis in some common endeavor'' (683). However, the larger point is that in verbally interpreting Cody's cries in this way, Buffy ratifies his contributions in the interaction, and as we will see now, she acts on them, not only verbally, but also in an embodied manner.

When Buffy says ''Let's see'' (line 44), her proposition looks forward to the action she is about to carry out – she is going to get in the water with Cody, presumably to test the water temperature. After a brief pause, she repeats, ''.is it cold\'' (line 45), and at the moment she says ''cold\'' with falling intonation, her knee touches the water, as she swiftly moves up and out from behind Cody to his left side, positioning herself to sit next to him in the water (see Fig. 1.5). The coordination of the last word of Buffy's ''.is it cold\'' with the movement of her knee touching the water act together as a single move to constitute a closing sequence to the crying episode. This coordinated move can be read as ''anticipatory contextualization of action'' (Mehus, 2011: 125) where Buffy, both through the falling intonation of her question, which does not elicit a response (as might be the case with rising intonation), and through her positioning of herself next to Cody in the water, creates a context in which Cody is not required to respond, and in which there is no longer a reason to cry, as the water is demonstrated as not being too cold. Thus, Buffy's embodied movement of getting in the water next to Cody works as answer to her own question about the water being cold, closing off this sequence with her move of participating in the joint



Fig. 1.5. Buffy says, ''. . . is it cold\'' as her knee touches the water.

activity of being in the water with her son. Indeed, Cody does not respond with any more cries, as he is possibly comforted and reassured by his mother's presence in the water next to him.

After the closing sequence to the crying episode, Buffy takes about one second to position herself in the water next to Cody, still holding both of his hands, and then starts to sing again, using the same introduction to the song as she has originally started out with, and shifting back to a much lower pitch – ''O:h he:'s'' and continuing the song with ''sweeter than a cookie on a cookie sheet.'' After she says ''sweeter than a cookie'', we hear Cody also make a much lower pitched vocalization, as he reaches his right hand and arm forward to a rock and Buffy lets go of his right hand. Thus whereas before, Buffy had altered her low pitch to match Cody's high-pitched cries, now Cody has altered his previous high pitch to match the low pitch of his mother's singing voice (doing so after an intonation unit from his mother).

To summarize, by closely examining this ''trouble spot'' and the question–response sequences within it, we have seen how Cody responded to his mother's questions at transition relevance places with cries, and how Buffy shifted her pitch to match her son's pitch and treated his responses and experience as relevant to the interaction through her speech and her physical action. We have also seen how Buffy ended the crying sequence with a coordinated move of interpreting Cody's crying as an assessment of the water being too cold and by making a joint commitment to be parallel in the activity of getting in the water with him.

### 5.3. Cody responds to Buffy's question with movement

Now I turn to the other question–response sequence in the interaction, which occurs after the crying sequence ends and after Buffy has been sitting in the water with a now much more cheerful Cody, singing to him for about 30 s. During this 30 s period, the two of them engage in a joint activity of Cody bouncing and splashing up and down in the water, which involves Cody bending and straightening his knees while Buffy has her hands around his torso and adds to the movement by moving her arms up and down from her elbow (see Fig. 1.6). This will become relevant in the analysis of the question–response sequence analyzed below, where I show how Cody answers his mother's question by initiating this movement.

Buffy ends this 30-s period of singing and Cody's bouncing at about 1.08 min into the interaction, at which point she kisses Cody on the cheek. After this kiss, there is a pause that lasts a little longer than a second, and then the relevant question–response sequence begins.

**Transcript Excerpt 1.2**: Cody responds to Buffy's question with movement

```
75 →  BUFFY;      Is it fun?
76 →  CODY;       ((STARTS BOUNCING MOVEMENT AGAIN))
77    BUFFY;      Is it fun?
78 →              O:h you like to splash
79    BUFFY;      #Y'at's [a boy
80 →  CODY;              [((VOCALIZES)) a:ha:ha:hah!
81    BUFFY;      Hahahaha
82 →              Yea(h)ah
83                (H)
84                o:h
85                o:h
86 →              ^Now it's nice.
87 →              It's not so cold now
```



Fig. 1.6. Buffy sings to Cody as they engage in a joint bouncing/splashing activity.

(a)                                      (b)                                      (c)



Fig. 1.7. Cody responds to Buffy's question with movement. (a) Buffy asks ''Is it fun?''. (b) Cody starts bouncing. (c) Buffy & Cody bounce.

Buffy asks Cody, ''Is it fun?'' (line 75, Fig. 1.7a). Up to this point, Buffy has provided a series of musical phrases, approximating the length of intonation units, in this interaction with her son. These may be working as a kind of scaffolding for turn-taking procedures (following Erickson, 2003). Note that the tonal nucleus of this question is ''fun'' and as Erickson (2015) points out, this directs the listener to new information to be responded to. Here we see that Cody, as we saw in the earlier question–response sequences, again responds to his mother's audible question (note that his gaze is directed away from her) at an appropriate transition relevance place. In response to his mother's question, Cody bends his knees and initiates the bouncing, splashing activity (line 76, Fig. 1.7b) that they had both engaged in previously (see Fig. 1.6). His initiation of this movement fits into a transition relevance place as a second pair part of this two-part interactional sequence, and can be interpreted as an assessment in response to Buffy's question.

Buffy demonstrates that she accepts Cody's movement as a response to her question. She responds to Cody's bouncing movement with ''O:h you like to splash'' (line 78), and also starts to move her arms up and down, which are holding Cody's torso, as she had previously, to contribute to the bouncing motion. Her use of ''oh'' here shows uptake of her son's response; with ''oh'' she demonstrates that she treats Cody's movement as new information, marks that she is an active recipient in the interaction, and ''ratifies the current division of turn-taking responsibilities in the exchange structure'' (Schiffrin, 1988: 99). With ''oh'' she attributes intention to Cody's response as part of the exchange structure, and then gives evaluation of his affective state as she sees evident in his response – ''you like to splash.'' This shows that she interprets his bouncing movement as a response to her question and as a demonstration of what he ''likes'' to do. In making this assessment, Buffy also voices Cody's embodied action – labeling his movement with her words, ''you like to splash,'' and in doing so she demonstrates that she treats it as a valid response to her question.

After saying ''O:h you like to splash'' and joining Cody in the bouncing movement, Buffy gives another evaluative statement of his behavior – ''Y:at's a boy'' (line 79) which is overlapped by a long wavering vocalization from Cody (line 80, Fig. 1.7c). Her evaluation ''Y:at's a boy'' further evaluates Cody as engaging in a pleasurable activity that he likes (drawing on her previous evaluative statement of ''you like the splash''). Cody's vocalization makes Buffy laugh (line 81) and she says, ''Yeah'' (line 82), a positive assessment marker and agreement token, and this is followed by ''o:h o:h. ^Now it's nice. It's not so cold now'' (lines 84–87). Her assessment ''Now it's nice'' is unclear in whether she is referring the activity or the water itself, but her statement ''It's not so cold now'' clearly refers to the temperature of the water, and back to the crying sequence that the both of them had overcome together earlier.

This is how the video ends, and on the surface, it shows Buffy as a competent mother, who has skillfully used both song and talk to engage with her son in a playful, musical activity, comforting him when he cries and getting him to play and enjoy the water in the end. In this way, Buffy accomplishes parenting work while engaging in play (see Gordon, 2008 on blending frames of work and play in family talk). However, close analysis has shown how pre-lingual Cody is also an active participant in this interaction with his mother. Although Cody has limited interactional resources, similar to Chil in Goodwin's (2011) study, he recognizes that Buffy's questions demand responses, and he responds to them at transition relevance places, vocally, with cries, and non-vocally, with situationally-relevant embodied movement. Cody demonstrates that he is able to interpret his mother's questions and also shows that he has a grasp of the turn-taking patterns of conversation to formulate appropriate responses at the right time. His acquisition of this system seems to be supported by Buffy's use of breath units in her singing and in her speech to Cody. I have also shown how Buffy ratifies Cody's responses as relevant, both in her spoken assessments of his responses and in her embodied movements, validating Cody's participation in the interaction.

## 6. Conclusion

In this study, I have analyzed how in three instances of the same interaction, one pre-lingual infant relies on his mother's audible speech and uses vocalizations (cries) and relevant embodied behavior as interactional moves, located at meaningful transition relevant places in question–response sequences with his mother. The infant's communicative processes examined here are similar to Chil's (Goodwin, 2011) use of gesture and prosodic variants of the word ''no'' at appropriate transition relevance places in question–response sequences with family members, and shows how infants can also recognize sequences and make use of the interactional resources available to them at transition relevance places. This analysis builds on previous multimodal research on infant communication that has demonstrated how pre-lingual infants are able to participate in social interaction through visible body behavior, including gesture, gaze, body posture, and the deployment of objects, as well as through non-verbal and proto-verbal vocalizations (e.g., Lerner and Zimmerman, 2003; Kidwell, 2005; Kidwell and Zimmerman, 2007; Lerner et al., 2011). In addition to examining an infant's interactional moves, I have also shown how the child's mother treats his moves as pertinent to the interaction. She shifts her pitch in relation to her child's cries, interprets his cries as assessments about the water temperature while simultaneously moving her body into the water to join him in the activity at hand, and treats his splashing response to her question ''Is it fun?'' as news and positively assesses his embodied behavior, thus supporting her child's language and music socialization.

I have argued that Cody's ability to respond at transition relevance places to his mother's questions may in part be supported by his mother's repeated use of patterned breath units in her singing and in her questions, as well as by the placement of the tonal nucleus within her questions. Thus, I have shown how it may indeed be the case that caregivers singing to infants could have implications for language acquisition and socialization, as argued by Erickson (2003, 2015), specifically in the acquisition of/socialization in turn-taking. Furthermore, in examining Buffy's interpretations and assessments of Cody's moves, I have found more evidence relating to the notion that AWMC caregivers, and likely many others, work to read into their children's actions and be more ''child-centered'' in their communication, although, as I noted, it may make more sense to consider this as it works in communities of practice, rather than equate it to macro-level social categories. However, Schieffelin and Ochs (1986) do write that turn-taking amongst caregivers and children can ''be used to make cross-cultural comparisons of socialization practices'' (171), and it would be interesting to compare the question–response sequences I analyzed here with other mother–infant interactions in different cultures.

In considering how these findings relate to language socialization, it seems that a similar process of music socialization is also occurring in this interaction. The way in which Buffy sings to Cody and incorporates song into his activities is repeated in other videos of their interactions on *Sesame Street*, and this use of musical prosody may be a way in which Buffy scaffolds not just turn-taking procedures for her son, but also to socialize Cody in how to use language musically, or even on a broader level, to instill an appreciation for music, for both Cody[4] and young viewers of *Sesame Street*. If such possible instances of music socialization were to be explored more, their analysis could only add to our understanding about the relationship between language and music, and what role they can play in caregiver–infant interactions. In conclusion, this study has analyzed linguistic, paralinguistic, and embodied interaction to show how a mother and her infant communicate in a multimodal semiotic ecology that supports the child's acquisition of turn-taking and sequencing in conversation through the use of questions and responses, assessments, prosody, and embodied behavior.

## Appendix

Transcript exported from ELAN, transcription conventions roughly match Du Bois et al. (2014); note that laughter is transcribed with ''ha'' instead of ''@'' and that latching is indicated with = instead of (0).

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[4] Information on Cody's musical career as an adult was found at http://www.berklee.edu/bt/152/alumnotes.html: ''Keyboardist Dakota Wolfchild of Kapaa, HI, and his Jawaiian/reggae band Revival played at Hempfest Kauai 2003 and Summer Solstice Folk Music, Dance, and Storytelling Festival, and released a CD in September.''

```
 1    Activity    ((BUFFY HAS BOTH ARMS AROUND CODY))
 2    BUFFY;      O:h
 3                #It's #a #nice #one
 4    Activity    ((BUFFY MOVES LEFT HAND TO CODY'S; HIS GAZE TRACKS MOVEMENT))
 5    BUFFY;      Oh it's a nice day.
 6    Activity    ((BUFFY MOVES RIGHT HAND; CODY'S GAZE TRACKS MOVEMENT))
 7    BUFFY;      Here's your song.
 8    Activity    ((BUFFY MOVES BOTH CODY'S HANDS UP))
 9    BUFFY;      He:'s a:
10                (H)
11                jumpy #little bean he's a bouncy machine
12                He's [Cody-o
13    CODY;           [(VOCALIZATION)
14    BUFFY;      Cody-o <SMILE VOICE>
15                jo
16                bum bum bum
17    Activity    ((CODY'S FEET TOUCH THE WATER))
18    BUFFY;      Who's the little baby that I love so much?
19                (H)
20                Cuter than a bunny in a bunny hutch
21                Who's the little fella that I love so:?
22                It's Cody-o
23                Cody-o Cody-o yo
24                Ah!
25                Cody-o Cody-o Cody-o yo
26                be boo boo
27                Oo Cody-o
28    CODY;       ((BARELY PERCEPTIBLE CRY))
29    Activity    ((CODY GRIMACES))
30    BUFFY;      Ah!
31                Oo
32    CODY;        (SNIFFLE)[heh heh
33    Buffy;              [Cody-o <SMILE VOICE>
34    CODY;       he [heh heh heh heh heh/
35    BUFFY;         [O:h\
36                Cody-o [do:h\
37    CODY;              [heh heh heh [[heh/
38    BUFFY;                          [[What is it\= ((LOW-PITCH))
39    ACTIVITY;                       ((BRINGS ARMS DOWN AROUND CODY, HUGS HIM))
40    CODY;                                  =he: ((HIGH PITCHED))
41    BUFFY;      What is it\ ((SHIFTS TO HIGHER PITCH, BREATHY VOICE))
42    CODY;       .[he: ((HIGH PITCHED CRY))
43    BUFFY;      [Is it cold?
44                 Let's see
45                ..Is it cold\ ((KNEE TOUCHES WATER AS SHE GETS IN WITH CODY))
46                O:h ((SWITCHES TO LOWER PITCH))
47                He:'s
48                sweeter than a [cookie on a cookie sheet
49    CODY;                      [uhh! ((LOWER PITCH))
50    BUFFY;      Tickle's little ribs and tickle his feet
51                Who's the little boy
52                I love so:
53                It's Cody-o Cody-o Cody-o yo
54    Activity    ((CODY SLAPS ROCK, BUFFY NODS))
55    BUFFY;      Ah!
56                Cody-o Cody-o Cody-o yo
57    Activity    ((CODY JUMPS))
58    BUFFY;      be bum bum
59                oh Cody-oh
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60              Ah!
61              oh Cody-oh
62              Ah!
63              Oh Cody-o   [do:hh <SMILE VOICE>
64    CODY;     ((GIGGLES)) [ha ha ha ha ha
65    Activity  ((BUFFY'S ARM IS STILL))
66    Activity  ((CODY BOUNCES MORE))
67    BUFFY;    yeah
68              Oh Cody-o
69              Ah!
70              Oh Cody-o
71              huh! bum
72              Cody-o yo:h
73              mmm
74              (KISS)
75              Is it fun?
76    CODY;     ((STARTS BOUNCING MOVEMENT AGAIN))
77    BUFFY;    Is it fun?
78              O:h you like to splash
79              #Y'at's [a boy
80    CODY;           [((VOCALIZES)) a:ha:ha:hah!
81    BUFFY;    hahahaha
82              Yea(h)ah
83              (H)
84              o:h
85              o:h
86              ^Now it's nice.
87              It's not so cold now.
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