LITERACY WITHOUT BORDERS: THE FINE-GRAINED MINUTIAE OF SOCIAL INTERACTION THAT DO MATTER (ALSO IN PROMOTING HEALTH LITERACY)

LETRAMENTO SEM FRONTEIRAS: AS MINÚCIAS DE GRANULARIDADE FINA DAS INTERAÇÕES SOCIAIS QUE TANTO IMPORTAM (TAMBÉM PARA PROMOVER LETRAMENTO EM SAÚDE)

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ABSTRACT
This paper explores the fine-grained interactional minutiae involved in promoting health literacy in medical interactions. More specifically, it explores the multimodal interactional resources (verbal and nonverbal) that health professionals and lay participants mobilize in order to make sense of fetal ultrasound images. We adopt the ethnomethodological perspective of Multimodal Conversation Analysis (SACKS; SCHEGLOFF; JEFFERSON, 1974; GOODWIN, 1981; 2010; MONDADA, 2018) to investigate 10 audio and video interactions that were recorded during fetal ultrasound exams that took place at a moderate and high-risk pregnancy ward in a public hospital in Brazil. Our aim is to 'make visible' the multimodal ethnomethods that interactants employ in order to render ultrasound images intelligible 'texts'. Among the various semiotic resources mobilized to achieve intersubjectivity in this complex setting, special focus is given to the healthcare professionals' use of similes, and the fundamental importance of the temporality in which verbal and nonverbal resources are mobilized in the process of making images intelligible. In that sense, we hope to bring to this special thematic issue the methodological advantages that a Multimodal Conversation Analytic perspective can afford to the discussion about multiliteracies and, in practical terms, to the advancement of health literacy. In medical contexts, health literacy can (and perhaps should!) be a concern 'at all points.' There might be no 'borders' to what constitutes a health literacy source or resource. Our claims, thus,

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are the following: (i) ultrasound images do constitute materials to be 'read' and understood – also by lay participants; (ii) healthcare professionals can (and perhaps should) promote health literacy among patients by employing efforts to make images 'readable'; and, finally, (iii) *social interaction* is one of the constitutive *loci* for the promotion of multiliteracy events.
Keywords: health literacy; multiliteracies; social interaction.

RESUMO
Este artigo explora a granularidade das minúcias interacionais envolvidas em promover letramento em saúde em interações médicas. Mais especificamente, explora os recursos interacionais multimodais (verbais e não-verbais) que profissionais em saúde e participantes leigas mobilizam para atribuir sentido a imagens fetais ultrassonográficas. Adotamos a perspectiva etnometodológica da Análise da Conversa Multimodal (SACKS; SCHEGLOFF; JEFFERSON, 1974; GOODWIN, 1981; 2010; MONDADA, 2018) para investigar 10 interações que foram gravadas em áudio e vídeo durante exames de ultrassonografia fetal, realizadas em uma ala de atendimento a gestações de médio e alto risco em um hospital público no Brasil. Nosso objetivo é 'tornar visíveis' os etnométodos multimodais que os/as interagentes empregam para transformar as imagens ultrassonográficas em 'textos' inteligíveis. Dentre os diversos recursos semióticos mobilizados para alcançar intersubjetividade, focamos nossa análise no uso que as profissionais fazem de símiles e na importância fundamental da temporalidade em que os recursos (verbais e não-verbais) são acionados no processo de tornar as imagens inteligíveis. Assim, almejamos trazer para este número temático especial as vantagens que a perspectiva analítica da Análise da Conversa Multimodal pode oferecer à discussão sobre multiletramentos e, de forma prática, ao avanço do letramento em saúde. Em contextos médicos, o letramento em saúde pode (e talvez deva!) ser uma preocupação constante. Nesse sentido, não deveria haver 'fronteiras' para o que constitui algo como fonte ou recurso de letramento em saúde. Assim, defendemos as seguintes posições: (i) de que imagens ultrassonográficas constituem materiais a serem 'lidos' e entendidos – também por participantes leigos/as; (ii) de que profissionais em saúde podem (e talvez devam) promover o letramento em saúde entre pacientes através de esforços interacionais para tornar as imagens 'legíveis'; e finalmente, (iii) de que a *interação social* é um dos *loci* constitutivos para promoção de eventos de multiletramento.
Palavras-chave: letramento em saúde; multiletramentos; interação social.

INTRODUCTION[1]

Consider the following fetal ultrasound image (Fig. 1) – an image that is projected on a computer screen and that becomes visually available both to the healthcare professional and to the (lay) patient while an exam unfolds.

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Fig. 1. Still ultrasound image of a fetal heart.

The image in Fig. 1 is actually what a pregnant woman, here called Graça, sees projected on the screen during a fetal heart ultrasound. Graça is 26 years old and 26-week pregnant with her second child. The child Graça is expecting has been diagnosed with Down syndrome. Now a fetal heart ultrasound is being performed since a 'golf ball' had been spotted in a previous (regular) scan.

Graça knows little about what a 'golf ball' is – only what she was able to find on the internet, as she discloses it to the doctor during the exam. It is Graça who introduces that topic when the doctor is still doing 'small talk'. She gazes fixedly at the grayish blurred images projected on the screen throughout the exam as if hoping not to miss anything[2], clearly demonstrating she wants to understand what is going on with her child and whether the 'golf ball' should be taken as yet an additional matter of health concern.

The event above described is real, has actually happened in our data, and is not an uncommon one. In fact, at the institution where this interaction unfolds, a department of fetal medicine specialized in moderate and high-risk pregnancy in a public hospital in Brazil, situations similar to this one are routine. In settings like that, pregnant women have to deal with the diagnosis of syndromes, malformations and a number of medical exams and medical terms unheard-of before. However, they can also benefit from a technological device that affords them 'to see' their

2. From field notes.

child, and that might help them understand what the unheard-of health conditions are.

The actual understanding of fetal ultrasound images, nevertheless, is something that cannot be taken for granted. One's eyes need to be guided into 'seeing' and 'making sense' of what is seen. Highly specialized images such as those produced in ultrasound scans require some guidance to lay eyes; they require that lay eyes learn how to 'read' them, and how to make them intelligible.

It is by looking at such a scenario that the current paper aims to collaborate with the discussion in this special issue, "Research practices in literacies across languages and social domains". This paper explores the fine-grained interactional minutiae involved in promoting health literacy in medical interactions. More specifically, it investigates the multimodal interactional resources (verbal and nonverbal) that health professionals and lay participants mobilize in order to make sense of fetal ultrasound images. By doing so, we hope to bring to this forum the methodological advantages that a Multimodal Conversation Analytic perspective can afford to the discussion about multiliteracies and, in practical terms, to the advancement of health literacy.

Literacy has been traditionally understood as one's ability to read and write. However, in the contemporary world, 'reading and writing abilities' no longer suffice to explain what literacy means. Currently, the concept of literac*ies* (in the plural) has evolved to be understood as meaning-making in a broader and richer sense so as to encompass sensemaking of several other ways of communicating in the world – e.g., visual, tactile, gestural. In order to communicate in the world, people need not only to be able to read (and write) 'texts', but also to produce and make sense of other ways, formats, and means of communication. This is, in fact, one of the motivations for the title of this paper: 'literacy without borders.'

Such a process involves the ability to recognize that "texts vary enormously depending on social context" (KALANTZIS; COPE, 2012, p. 3), i.e., that there are several cultural, social and linguistic aspects that constitute the various means of communicating and making sense. New ways of participating in social encounters and in the world at large have resulted in transformations in society. Together with the technological advancements, new literacies have emerged: "Meaning is made in ways that are increasingly multimodal – in which written-linguistic modes of meaning interface with oral, visual, audio, gestural, tactile and spatial patterns of meaning" (KALANTZIS; COPE, 2012, p. 14). Multimodality, thus, "goes beyond written and spoken language" and "requires multiple forms of representation, such as writing, image, speech, gesture and music" (ARCHER, 2014, p. 106).

In this paper, we adopt the ethnomethodological perspective of Multimodal Conversation Analysis (SACKS; SCHEGLOFF; JEFFERSON, 1974; GOODWIN, 1981; 2010; MONDADA, 2018) to investigate transcribed audio and video interactions in Brazilian Portuguese that were recorded during fetal ultrasound exams. Our aim is to 'make visible' the multimodal ethnomethods that interactants employ in order to render ultrasound images intelligible 'texts'. Among the various semiotic resources mobilized to achieve intersubjectivity in this complex setting, special focus is given to the healthcare professionals' use of similes, and the fundamental importance of coordinated temporality in the process of making images intelligible.

1. MULTILITERACIES

The expression "pedagogy of multiliteracies" was first used in September 1994, during a week of meetings and debates held by the New London Group (COPE; KALANTZIS, 2000). In 1996, a *manifesto* was launched by ten researchers from various fields, who jointly proposed what the multiliteracies research agenda would consist of. Since then, research studies on literacies and multiliteracies have been steadily developing (COPE; KALANTZIS, 2009; KALANTZIS; COPE, 2012; ARCHER, 2014; COPE; KALANTZIS, 2015; TANNER, 2017, *inter alia*) as well as expanding to other, more specialized domains, such as *health* literacy, *scientific* literacy, and *digital* literacy.

In a rapidly changing world, with incredibly fast technological advancements, new demands have emerged, among them, the needs (1) to change the way literacies are treated in the process of knowledge production, and (2) to integrate 'modes of meaning' into cultural practices (COPE; KALANTZIS, 2009). In order to tackle these demands, Cope and Kalantzis (2009) propose to consider everyday experiences and their inherent features as some of the fundamental aspects of multiliteracies, and to actively engage literacy agents (here understood as not restricted to agents in educational contexts) in designing their future, choosing new ways of interacting in society, and critically analyzing them.

Multiliteracies, thus, seek to reflect the diversity of semiotic resources which are coordinately used to constitute meaning. For example, in educational settings, the assignment of a reading comprehension task should go beyond simply 'decoding' letters and displaying understanding – what a more logocentric perspective would do. Instead, students are invited to explore a multiplicity of other sensemaking resources, such as images, videos, and even font type and size.

The interest in multimodal resources as fundamental for meaning-making processes was, in fact, central for The New London Group. With that agenda, the group sought to systematize the various "modes of meaning" involved in multiliteracy practices (i.e., linguistic, audio, spatial, gestural, and visual design), as represented in Fig. 2.

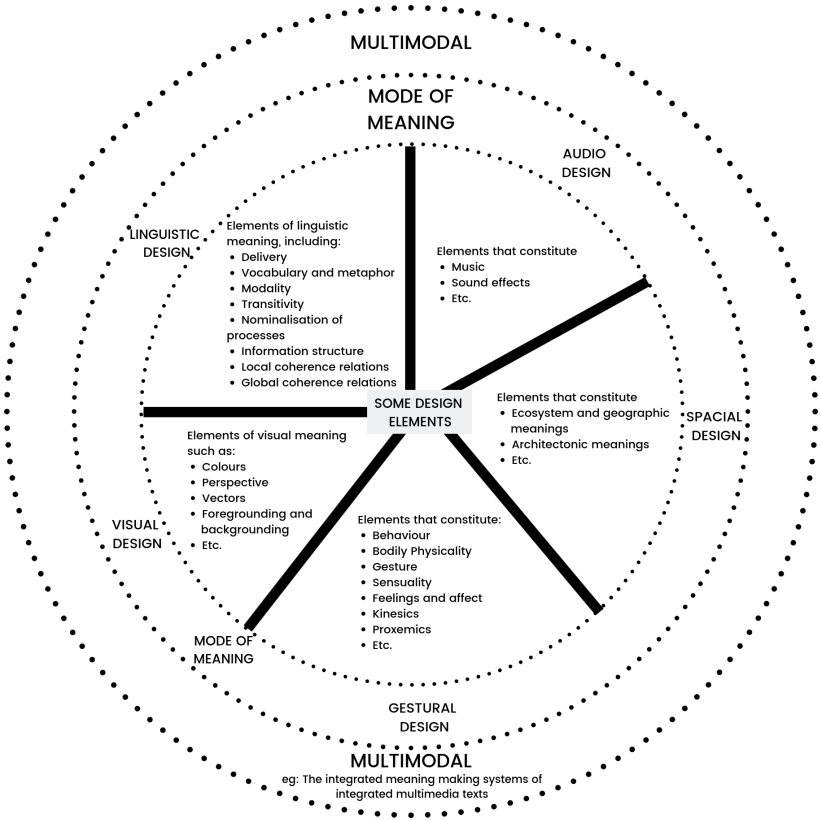


Fig. 2. Multimodal meaning-making design
Source: Reproduced from The New London Group (2000, p. 26)

Thus, from a multiliteracies perspective, in which different modes of meaning-production and meaning-making are made available, participants "gain substantively in metacognitive and metalinguistic abilities and in their ability to reflect critically on complex systems and their interactions" (THE NEW LONDON GROUP, 2000, p. 15). The diversity of semiotic resources listed in each segment of the

diagram in Fig. 2 would help explain how they operate in coordinated ways to make a web of 'texts' (not only 'written texts') intelligible.

In sum, the multiliteracies concept reflects on two main aspects: linguistic diversity and multimodal modes of communicating. In the context analyzed in this paper – doctor-patient interactions during ultrasound scans –, the use of a multiplicity of semiotic resources, designed for each participant and each sequential environment, and adjusted to the local ecology of ultrasound exams, demonstrates that 'reading' – or ensuring image intelligibility – might be imperative.

2. HEALTH LITERACY

"Health literacy" was first used by Simonds in 1974 in a paper titled "Health education and social policy", but its meaning then was bound to education only. In discussing the need for social policy of health education – which demanded responsibility, action, and articulation among the healthcare system, the educational system, and mass communication –, the author advocates for minimum standards of "health literacy" at all levels in schools (1974, p. 9). The interest in promoting active citizenship for human advancement was evident in Simonds' call:

> a healthier population – a population that takes greater responsibility for protecting and maintaining its own health, that utilizes the health care system as effectively as possible, and that takes an active role in shaping the health care system of the future (SIMONDS, 1974, p. 9).

It was only in 2000, however, that the concept of health literacy was formally defined for the first time, clearly assuming a more encompassing meaning, no longer restricted to education nor just to reading and writing, but understood as "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (RATZAN; PARKER, 2000, p. vi). Such understanding has been somewhat sustained to present days:

> Health literacy is linked to literacy and entails people's knowledge, motivation and competences to access, understand, appraise, and apply health information to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course (SORENSEN et al., 2012, p. 3).

It becomes clear, thus, that health literacy is currently taken both as a goal and a requirement in a world that increasingly demands that citizens engage in active participation, and that they take responsibility over healthcare, health promotion

and disease prevention. However, it becomes a premise that in order to be able to take a more active role over one's health, one must *understand* health information (CONNELLY; SPEER, 2017). This brings us to the fact that getting health-informed is largely accomplished (despite not being restricted to) *in social interaction* between healthcare professionals and laypersons (OSTERMANN; PEROBELLI, 2019). In other words, doctor-patient interaction becomes an important *locus* for doing health literacy – or, to put it differently, doctor-patient interactions (might) become actual literacy events in themselves, as we hope to demonstrate next.

3. METHODS

The data analyzed are part of a larger project (OSTERMANN, 2013) that investigates transcribed audio and video recorded interactions between doctors and patients in fetal medicine in moderate and high-risk pregnancies in a public hospital in Brazil. Video recordings, due to IRB constraints, were limited to the ultrasound screen and to what happened in front of the screen (e.g., pointing). Despite that being a limitation in terms of access to the visual orientation of the participants, and to the gestures performed by the pregnant women, the actual camera focus on the screen provided us, analysts, with a close visualization of other resources, such as how participants coordinate the ultrasound devices and functions (e.g., mouse pointer, zooming in and out, freezing and unfreezing, image stabilization etc.), talk, and the professional's gestures (e.g., pointing to the screen with the finger, head movement toward the patient, among others).

Fig. 3. Screenshot of visual access provided by video recordings of our data (OSTERMANN, 2013)

Ultrasound imaging, from a medical perspective, serves to inspect the fetal and uterine health conditions by means of visualizing the interior of a pregnant woman's body. Nonetheless, healthcare providers also tend to show what they see on the screen to the patients rather than inspecting the images silently (NISHIZAKA, 2014). Such guided visualization, thus, results in a secondary (but not necessarily less important) purpose that obstetric ultrasound exams assume: a 'social' function, patient-centered one, that is to afford 'peaking' into one's child and, possibly, developing bonding with them (JONSSON, 2007). In this paper we argue that professionals do more than only showing the images on the screen; they teach patients 'to see' or 'to read' the images by means of the multimodal meaning-making resources available in this ecology.

In order to analyze and demonstrate how a fetal ultrasound imaging exam becomes a multiliteracy event, in addition to transcribing the verbal aspects of language based on the conventions proposed by Jefferson (1984), a fine-grained, second-by-second multimodal transcription (MONDADA, 2016) of the data is mandatory. It is only by means of such detailed transcription that one can inspect and make available to peers the temporal coordination of the multiple modes of meaning-making resources. The transcription of the participants' verbal conduct has been done in a three-line system. 1st line: presents the original language, Brazilian Portuguese, 2nd line: a gloss in English, 3rd line: a free translation also in English. The interactions were analyzed in terms of both their detailed sequential and multimodal unfolding (SACKS; SCHEGLOFF; JEFFERSON, 1974; GOODWIN, 1981; 2010; MONDADA, 2018) in order to describe the work involved in making blurred images on the screen intelligible to laypersons.

4. THE FINE-GRAINED MULTIMODAL WAYS OF PROMOTING HEALTH LITERACY IN INTERACTION

Sociological studies about fetal ultrasounds report that parents are highly dependent on the professionals who perform the scans to be able to make sense of their baby on a screen "amidst the swirling grey mass of echoes" (MITCHELL, 2001, p. 120). Thus, by 'translating' the technical images into everyday language and instructing the parents' lay vision, professionals help them "to organize *how* and *what*" is shown on the screen (JONSSON, 2007, p. 112, emphasis added). However, such an organization takes work; in particular, *interactional* work, here understood as involving all types of semiotic resources that participants mobilize in order to understand one another and what is going on.

Within the context of talking about ultrasound images, referencing work becomes of paramount importance to mutual understanding. Referencing in interaction requires that the introduction of new referents be done by means of a fine coordination between an "environmental noticing" (SACKS, 1992), embodied and/or verbal referential expressions (which initiate the orientation towards a joint focus of attention), and the actual establishment of a mutual referent (DE STEFANI, 2014) so that participants can predicate about it (MONDADA, 2012).

In the subset of 10 interactions analyzed for the current study, the professionals who perform the scan (who, under the Brazilian legislation, must be physicians), when referring to the fetal images on the screen to the pregnant woman (and companions, when it is the case), do so in order to accomplish two main actions. They do so (1) to help their interlocutor(s) see what they see (i.e., baby's stomach, hand, feet etc.) or (2) to identify and predicate about them (i.e., "that dark spot in the stomach is what we are investigating").

Therefore, it is on the multimodal interactional work involved in making something seen – or 'readable' – and understood that we would like to center our discussion next. Our claim is that a fine-grained multimodal analysis of naturalistic social interaction can reveal the details involved in pursuing and achieving 'literacy' in a health context – the fine-grained minutiae that do matter, as proposed in the title of this article. On what concerns the granularity of details, Schegloff claims that:

> [o]n the one hand, the introduction of this order of observation and the insistence on its relevance to sociology is grounded in the claim [...] that interaction is co-constructed by its participants at this level of 'detail' and finer yet, and that by the deployment of such resources for interaction, determinate social actions are differentially deployed, relationships constituted, etc. On the other hand, the level of granularity at which noticing is done matters not only for the social actors being studied, but for us as investigators as well; so too at what level the observed or noticed world is described (SCHEGLOFF, 2000, p. 719)

We would like to explore the range of multimodal resources that participants launch in order to accomplish 'looking and seeing' or 'reading and understanding' highly technical images of a fetus on the screen.

In order to accomplish our aim, we first discuss three excerpts in which the professionals coordinate different semiotic resources to show fetal images (and make them seen) to the pregnant women who, in their response, actually indicate having been able to 'see' them. At the end of the section, we present an excerpt in which multiliteracy fails to be accomplished, and explore the insights that a fine-grained analysis might reveal about possible reasons for such a disruption.

Metaphors, a figure of speech derived from the Greek root "metapheiren", meaning "willing to transfer", consist of "an implied comparison in which a word or phrase ordinarily used for one thing is applied to another" (BEISECKER; BEISECKER, 1993, p. 48). Largely studied in cognitive linguistics, metaphors show to be pervasive in everyday life (LAKOFF; JOHNSON, 1980). In fact, given their pervasiveness, metaphors, as well as other metaphor-related figures of speech, have triggered the interest of researchers investigating the medical domain (FLEISCHMAN, 2001; KIRLIN, 2001, CASARETT et al., 2010, MASUKUME & ZUMLA, 2012; VAN TONGEREN, 1997, *inter alia*).

Van Tongeren (1997) explains three functions of metaphorical expressions in medicine: (i) catachretic, that is to fill vocabulary gaps; (ii) didactic function, used to explain the unfamiliar by reference to the familiar; and (iii) theory-constitutive, which works to explore little understood phenomena. Metaphorical expressions are also used as teaching aids among health professionals and health professionals to-be, constituting useful resources to enable relatedness with something familiar to the interlocutors, and thus making recognition and understanding easier (MASUKUME; ZUMLA, 2012).

Among the types of metaphors, there is one that is recurrent in our data: 'simile'. Similes work like a metaphor, but they make the comparison itself explicit (KNOWLES; MOON, 2006, p. 6). An example from our data is the format "That part that looks like X is Y"; e.g., "That part that looks like a shining ball is the bladder".

Excerpt 1 represents a segment of a fetal heart ultrasound performed in the pregnant woman Graça – who has been introduced in the first section of this paper (see also Fig. 1). As described earlier, the fetus under examination has been diagnosed with Down syndrome, and the current scan is performed for a 'golf ball' had been observed in a previous regular imaging exam.

Before we move to the excerpt itself, it is relevant to explain that the 'golf ball' expression consists of a conventionalized metaphor used in the medical field to refer to the phenomenon technically known as "echogenic cardiac foci", which is a normal variation in the development of the papillary muscle (BETTELHEIM et al., 1999). Even though "golf ball" does consist of a metaphor itself and, thus, also works towards its identification on the screen, our focus here is actually the

multimodal interactional work the professional embarks on to make the technical image on the screen 'readable' (or intelligible) to the pregnant woman, an activity which involves, among other multimodal resources, the launching of a simile[3, 4].

```
1 DOC: hã:: tá- (tu) já viu o + o golf ball?
            PRT you already saw the the golf ball
               have you already seen the the golf ball
                              +fre.---->>
2      (1.2)
3 PAT: pois é s- +tinha no- na outra+ ecografia=
       'cause is  s- had in the.MAS in the.FEM. other.FEM ultrasound
       yeah s- it showed in the- in the other ultrasound
                +t.s.p/ PAT--------+
4 DOC:                                          =+esse+
                                                  this
                                                 +....+
5      +pontinho aqui brilhante+
        dot.DIM here shiny
        shiny little dot here
       +p.F-------------------+
6      +(.)+
       +,,,+
7 DOC: +parece uma bolinha aqui.= +
        looks.3SG like a ball.DIM here
        looks.3SG like a little ball here
       +.........+p.F-----------.+
8 PAT:                          =+é:.+
                                   is
                                   yes
   doc                             +,,,+
9      (0.8)
10 DOC: de golfe [de golfe]
       of golf   of golf
11 PAT:          [diz] que é um- um musculozinho né
                  say.3SG  that is a a muscle.DIM PRT
                  they say it's a a little muscle right
12     (0.9)
13 DOC: ↑é::-
        be.3SG
        yes
14     (1.1)
```

3. The transcription conventions are available in Mondada (2016) at: https://franz.unibas.ch/fileadmin/franz/user_upload/redaktion/Mondada_conv_multimodality.pdf
4. Excerpts 1-4 employ the following abbreviations for the participants: PAT (pregnant woman); RES (resident doctor); DOC (echocardiographist doctor).

Excerpt 1: Bola de Golfe 'Golf ball' (HMF_ECOCARDIO_graca_LUANA_16_10_13_4m36V)

In line 1, the doctor freezes the image and, by means of an information request: asking whether the patient has already seen the golf ball, produces a pre-invitation to see the image. As the patient begins to respond, the doctor turns the screen towards the patient's visual field and, in overlap with the patient's turn, identifies the golf ball. Instead of identifying the golf ball by simply naming it ("this is the golf ball") and pointing at it on the screen, the professional breaks down the reference to the golf ball into segments.[5] First, she produces a metaphor ("this shiny little dot here" – lines 4-5) in coordination with the gesture of pointing with her finger.[6] The doctor then produces a simile ("*looks like* a golf ball" – lines 7-10), thus teaching the patient to see the echogenic cardiac foci, which has been introduced to her by means of the conventionalized metaphor of a "golf ball".

Excerpt 1 shows a fine coordination of verbal resources (among which, figures of speech) and gestural resources (including pointing) to foreground the referent so that the patient can 'read' it "amidst the swirling grey mass of echoes" (MITCHELL, 2001, p. 120) on the screen. The pointing gesture endorses the activity of foregrounding the focus of attention, which is responded to by the patient, in line 8, with a display of understanding.

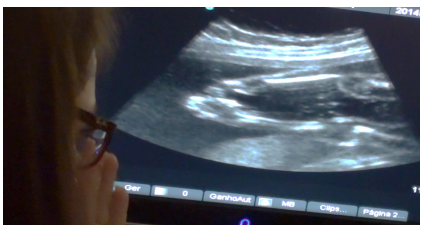
Excerpt 2 is a segment of a morphologic ultrasound scan performed by a resident doctor. The pregnant woman presents gestational diabetes and a history of miscarriages. In this interaction, the resident doctor shows the hands of the fetus. Differently from Excerpt 1, Excerpt 2 does not introduce an image of medical concern. However, it is not less important. In fact, being able to 'see' one's child (while the baby is still in the womb) and thus to create affective bonding[7] has been one of the central positive (non-medical, but social) outcomes of fetal ultrasound imaging technology (JONSSON, 2007).

5. Notice that in line 3 the patient evidences familiarity with the term "golf ball".
6. Both Conversation Analysis and Multiliteracies are concerned with social actions, i.e., going beyond verbal resources and focus on the coordination multiple modes of meaning-making, such as verbal and gestural design (here represented by pointing with finger, which indexes the exact position of the "golf ball") (THE NEW LONDON GROUP, 2000).
7. Excerpts 1-4 employ the following abbreviations for the participants: PAT (pregnant woman); RES (resident doctor); DOC (echocardiographist doctor).

Excerpt 2: Parece que tá rezando 'It looks like s/he is praying'
HMF_ECOMORFO_talise_RAFAELA_26_03_14A_30m20V

```
01          +(3.8)
   res      +sta.----->>
02 RES:     ó. ó as duas mãozinhas +assim
            ó ó the two hands.DIM like this
            ó ó both little hands like this
                                    +imi.-->
03          >parece que tá< #rezando ó+
            looks.3SG that is praying ó
            ((it)) looks like s/he is praying ó
                                    ->+
     fig                    #fig.1 M
04          (0.7)
05 RES:     na frente do rosto ó
            in front of the face ó
06          (.)
07 PRE:     mhm
            (1.1)
```

FIG. 1



Just before announcing what is projected on the screen (i.e., the baby's hands, line 2), the resident doctor stabilizes the movement of the transducer on the pregnant woman's abdomen (line 1). Stabilizing the image is crucial here to make the image visually available for the pregnant woman. The doctor then invites her to see the hands of the fetus (line 2) by temporally coordinating the following semiotic resources: (i) stable image of the fetus' hands in the screen, (ii) display of a noticing ("ó", line 2), (iii) verbal reference of the hands ("both little hands", line 2), (iv) a mimetic gesture that represents the current arrangement of the fetal hands on the screen (line 3) – 'structural isomorph' (NISHIZAKA, 2011), (v) a simile ("*it looks like* s/he is praying", line 3), and, at last, (vi) the index of the position of the hands in relation to the face of the fetus (line 5).

The sequential and multimodal analysis of this excerpt allows us to explore the multimodal meaning-making design (Fig. 2), as proposed by The New London

Group (2000). In Excerpt 1, semiotic resources from both linguistic and gestural fields are mobilized. In Excerpt 2, however, the simile is also constituted by a gestural resource that mimics a hypothetical embodied action of the fetus, providing space for the creation of affective bonding, which is also elicited as an element that enhances meaning-making, according to Cope and Kalantzis (2000).

The doctor works to build a fine coordination of multiple semiotic resources to foreground the activity of the fetus as something worth being seen. The launching of a simile that refers to the fetus' disposition on the screen instructs the patient's vision to localize it and make it intelligible, a process that seems to be successful to some degree, as the patient displays, even though minimally, some understanding (line 7).

Excerpt 3 is part of a fetal heart ultrasound scan. The doctor verbally describes what she sees on the screen as she performs the exam. We join this interaction when the doctor stabilizes the transducer on the pregnant woman's abdomen in order to visually inspect the fetal heart.

Excerpt 3: Mãozinhas batendo palmas 'Little hands clapping'
HMF_ECOCARDIO_LUANA_ariane_08_01_14

```
01 DOC:   >>+°conforme° o bebê vai crescendo,
             according the baby goes growing
             as the baby grows
          >>+sta.--->>
02 PRE:   °m[hm:°]
03 DOC:     [os  ] ossos ficam mais fo::rtes,
          the bones get more strong
          the bones get stronger
04        e vão escondendo a imagem.
          and go covering the image
          and covers the image
05        (.)
06 DOC    parece umas mãozi::nhas batendo palmas,
          look.SG like some hands.DIM clapping
          ((it)) looks like some little hands clapping
07        a↑li que são as válvulas de ↑dentro
          there that are the valves of inside
          over there they're the valves inside
08        do coração do teu bebê.
          of the heart of the your baby
          of your baby's heart
09 PRE:   °m: no::ssa::°
              our
              oh my
```


In line 6, the doctor predicates on the image currently projected on the screen by producing a simile: "*((it)) looks like* some little hands clapping". This simile, just as we have seen in happening in Excerpts 1 and 2, pursues the mutual establishment of the referent with the pregnant woman. In this case in particular, the simile instructs the vision of the pregnant woman by comparing the movement of the heart with something a layperson can relate to: clapping hands. As a result of the coordination of the various and distinctive semiotic resources, the pregnant woman displays, in line 9, some type of evaluative understanding of the image ("oh my").

The similes produced in the three excerpts discussed so far work towards instructing the pregnant women's vision to a single focus of attention (as there are different masses of images on the screen) by comparing specific technical terms with layperson's commonsensical descriptions and objects: hands in the position of praying, clapping hands, and a shiny little ball. Notice, however, that these similes are not produced in isolation and, thus, do not work by themselves; they are finely coordinated with the temporal and visual availability of the image of the referent on the screen and with gestures of pointing and/or structural isomorph.

We now move to the analysis of a different case. In Excerpt 4, we present yet another instance of the use of the 'clapping hands' simile. Nevertheless, here we explore what happens when a verbal resource (here also a simile) is not produced in temporal coordination with other semiotic resources, and the consequent unintelligibility of the image by the patient.[8]

8. The results of fetal heart scans are registered in two computer screens in our research setting. In the three seconds of pause represented in line 6, the doctor registers the results she got on the computer screen which is located behind the one which she uses to perform the scan. This embodied action is represented by "reg.OS" in the multimodal transcription of line 6.

Excerpt 4: As válvulas de dentro do coração 'The valves inside the heart'
HMF_ECOCARDIO_amanda_LUANA_11_12_13_50sV

```
01        + (0.9)+
      doc +z.in--+
02 DOC:   a gente vai ampliá:, essa ima:gem,
          the people will zoom in this image
          we'll  zoom in this image
03        (1.2)
04 DOC:   +ali o co+raçãozinho, >a gente tá vendo< ele bem:
          there the heart.DIM   the people is seeing it well
           there the little heart we can see it right
          +z.in----+
05        de fre:nte, as válvulas +de ↑dentro do coração parecem
          of front the valves from inside of the heart look like
          the front of the valves inside the heart they look
          like
                                  +fre.------->1.7
06        umas mãozi:nhas batendo palmas, + (3.0) +
          some hands.DIM clapping palms
          some little hands clapping
                                              +reg.OS-+
07 DOC:   são válvulas de +↑de:ntro do coraçã::o,
          are valves of inside of the heart
          they're the valves inside the heart
                          ->+
08        (2.2)
```

In line 6, immediately before producing the simile of the little hands clapping, the doctor freezes the image. Because this specific simile depends on the visibility of the intrinsic kinetics of the "hand-clapping" action, the pregnant woman is removed the opportunity to see the movement when the doctor freezes the image (line 5) before referencing it. As a consequence, the pregnant woman does not display any evidence of understanding the image.

What happens in Excerpt 4 is clearly different from what has been evidenced in Excerpts 1, 2 and 3. In the earlier excerpts, the doctors, who are in control of the ultrasound equipment, accomplish a fine temporal coordination between image, talk (including the use of similes and/or metaphors), kinesics and gesture, while the patients respond with some kind of understanding display to invitations to see the images.

It is important to highlight that in all the excerpts presented in this paper, the participants mobilize similar resources, in particular, the use of similes. Nonetheless, the mobilization of those resources differs in terms of their temporal coordination with other modes of meaning, such as visual and gestural. In all the cases, the

movement of the transducer works as a crucial semiotic resource since it delimits the field of visibility to only certain regions of the patient's abdomen.

Thus, as it becomes evident in the analysis, the control of the transducer works as a gatekeeper in ultrasound scans, allowing to develop "the capacity to engage with issues from a scientific perspective" (KELLY; LICONA, 2018, p. 161). The power of the transducer in the meaning-making process is especially evidenced in Excerpt 4, when it becomes clear that the use of a variety of semiotic resources, such as similes, conventionalized metaphors, and place referents, proves to be useless to promote understanding when the image projected on the screen no longer corresponds to them. In fact, it is the actual temporal coordination of all the resources available in this ecology that can more fruitfully help the participants to achieve understanding.

Therefore, the analysis shows that the use of similes works as an important language resource to build joint attention and promote 'image literacy' in the context of ultrasound exam interactions. However, it also becomes evident that, in a naturalistic multimodal ecology like the one investigated here, similes do not sustain alone the accomplishment of image understanding. Instead, they require a precise temporal coordination among the exact image being referred to, its projection on the screen and embodied gestures (such as pointing and structural isomorph), so that the pregnant woman have all the resources at display to actually be able to 'read' the images; to see what the doctor sees.

FINAL CONSIDERATIONS

Based on the understanding that metaphors (here encompassing similes) are linguistic resources that help constitute the production of meanings in social interaction, in this paper we analyzed how their coordination with other semiotic resources helps to accomplish the intelligibility of ultrasound fetal images. Among other resources, we examined the use of similes in promoting patients' understanding of images. However, we have also shown that the use of similes is effective only when temporally coordinated with gestures (pointing on the screen, cf. Excerpt 1; a mimetic gesture of prayer position, cf. Excerpt 2) and with the timing of the projected images on the screen. The sequential and multimodal analysis shows that the coordination of these fine-grained interactional (verbal and nonverbal) 'details' or minutiae *do* matter since they are imperative in achieving mutual understanding and in rendering images intelligible also to lay participants – or, as we dared to claim here, in rendering images "readable".

Finally, we return here to the title of this article: 'literacy without borders.' In medical contexts, health literacy can (and perhaps should) be a concern "at all points.[9]" There might be no 'borders' to what constitutes a health literacy source or resource. Our claims, thus, are that ultrasound images do constitute materials to be 'read' and understood – also by lay participants. That healthcare professionals can (and perhaps should) promote health literacy among patients by employing efforts to make those images 'readable'. And, finally, that *social interaction* is, no doubt, one of the major constitutive *loci* of multiliteracy events.

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9. Borrowed from Sacks' (1984, p. 22) expression: "social order at all points."

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APPENDIX: TRANSCRIPT CONVENTIONS, ABBREVIATIONS AND OTHER NOTATIONS

Participants' embodied conduct based on Mondada (2016)

+ + indication of the beginning and end of embodied conduct performed by the professionals

... indication of the preparation of certain embodied conduct

--- indication of the activation and maintenance of certain embodied conduct

,,,, indication of the retraction of certain embodied conduct

Abbreviations of the descriptions of embodied conduct

fre. – doctor freezes the image

imi. – doctor imitates the body disposition of the fetus

poi.F. – doctor points with their index finger

sta. – doctor stabilizes the movement of the transducer, but does not freeze the image on screen

z.in – doctor zooms in the image

t.s.p. – doctor turns the screen to the patient

Notation on Brazilian Portuguese

ó – an interjection; kept as in the original verbal production; possibly a reduction of olha ("look"); second person of the imperative

DIM. – diminutive suffix (-inho, -inha, -zinho, -zinha)

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