Objects that matter : The hybrid and distributed agency in parent-assisted homework interactions

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Abstract

It has been two decades since the social-material turn in social interaction studies proved the heuristic limits of a logocentric analytical geography. In this paper, we focus on the performative function of objects in an underexplored learning activity: parent-assisted homework. Adopting a Conversation Analysis informed approach complemented by the ventriloquial perspective on communication, we illustrate how parent-assisted homework is accomplished through the multiple resources in the semiotic field. Particularly, we show how participants orient to and exploit the agency of materiality in interaction. In the conclusion we raise a socio-pedagogical issue concerning the cultural capital embedded in the learning environment as well as the parents' competence in recognizing and exploiting it in ways that are aligned with the school culture.

Keywords: socio-materiality, agency, homework, parent-child interaction, ventriloquial perspective

1. Introduction

Following Latour's critique of a sociology without objects (Latour 1996, 2002), in the last twenty years a great amount of research has focused on the relationship between humans and materiality and proposed to conceive "agency", i.e. the competence in making a difference in the unfolding of the interaction, as hybrid and distributed among human and non-human actants (Cooren 2006, 2012; Latour 1996, 2005). Providing a system of socio-material constraints and possibilities, artifacts channel certain courses of action rather than others and, therefore, convey specific ideologies and cultural models that shape the activity at stake. In line with this renewed attention for materiality, and in opposition with an exclusively humanistic conception of education (Landri and Viteritti 2016), educational research has been investigating the role of socio-materiality in learning processes. Overcoming a human-centered approach as well as any binary distinction between the social and the material, nature

and culture, humans and non-humans, the socio-material approaches in education conceive the learning event as a "performance rooted in praxis" (Ferrante 2016, 54), influenced by entities belonging to "multiple ontologies" (Fenwick et al. 2011; Fenwick and Landri 2012). In other words, every learning process occurs in a cultural and socio-material environment, which sets the constraints as well as the possibilities for it (Cook-Gumperz et al. 1986; Goodwin 1990; Pontecorvo et al. 1991).

This article focuses on a phenomenon that, despite its relevance in the learning process, is still unexplored from a socio-material viewpoint: the homework activity. Entailing interactions with both social actors and artifacts, doing homework constitutes a "perspicuous case" (Garfinkel and Wieder 1992) for observing the performative functions of objects (Latour 1987, 1996) in action formation and, in particular, the situated and socio-material character of the learning process (Vygotskij 1962 [1934]). Adopting a Conversation Analysis informed approach complemented by a ventriloquial perspective on communication (Cooren 2010, 2012), we illustrate the constitutive role artifacts play in parent-child scaffolding sequences during homework, as well as participants' orientation to these artifacts as carriers of meaning.

The paper is structured as follows. In the introductory sections, we outline the roots and development of the contemporary socio-material turn in language and social interaction studies, with a particular emphasis on the ventriloquial theory of communication (Cooren 2010, 2012). Then we outline the issue of socio-materiality in educational research. In the following sections, we present a series of excerpts of video-recorded object-mediated parent-child interactions during homework. The analysis illustrates the hybrid and distributed character of agency in this kind of interaction: agency is hybrid because it entails both human and non-human actors, and it is distributed as they both make a difference in the unfolding of interaction (Caronia and Cooren 2014). In the conclusion, we raise the socio-pedagogical issue of the cultural capital embedded in the socio-material learning environment (Bourdieu 1986) as well as the parents' competence in recognizing and exploiting it in ways that are aligned with the school culture.

2. The agency of things: the socio-material turn in social sciences

Questioning the ontological primacy of humans in the meaning-making process and overcoming any simplistic binary distinction between human action and structure, socio-material approaches stress the constitutive role of artifacts in the unfolding of social practice

and interactions. In this tradition, material features and objects are conceived not only as products of human action or symbolic tools communicating identities and cultures (Csikszentmihalyi and Rochberg-Halton 1981; Douglas and Isherwood [1979] 1996; Bruni 2005; Iori 1996), but also and more importantly, as active agents shaping human praxis. As underlined by the affordance theory (Gibson 1977, 1979; Hutchby 2001; Norman 1988), the sociology of techniques (see Akrich and Latour 1992) and the semiotics of objects (see Landowski and Marrone 2002), artifacts indicate possible actions, set constraints and create possibilities, thus channeling human agency toward certain courses of action and meaning-making processes rather than others. Studies on the communicative constitution of social environments (Cooren 2010; Taylor and Van Every 2011) and research on things and texts as meaning-making devices (Aakhus 2007; Barley et al. 2012; Brummans 2007; Bruni 2005) empirically show that the material organization of a place, its texts and documents as well as the location of the artifacts (e.g. the technical equipment of an office, Cooren et al. 2012) influence the understanding of what is going on in the interaction and matters for the participants. Once designed for doing something and introduced into the interactional scene (or "delegated", Latour 1996) by humans, objects and material features of any kind make sense and have an agency of their own (Latour 1996).

The interest for artifacts and materiality in social practice has even concerned fields of study traditionally and programmatically focused on language and *talk*-in-interaction. Although language is uncontestably "the most sophisticated form of human expression" (Duranti 2004, 455) and has long been studied as the primary locus for the (re)construction of society and culture, a suspicion regarding this "restricted analytical geography" (Goodwin 2011, 184) to human interaction has gradually surfaced.

In his pioneering research, Charles Goodwin developed a theory of action where "the details of language use and […] the social, cultural, material and sequential structure of the environment" are recognized as essential elements for the production and interpretation of action (Goodwin 2000, 1491). Emphasizing the multimodal, cooperative and distributed character of human activities, Goodwin proposed an *embodied* analytic approach to investigate social action, i.e. a method of analysis complementing the study of talk in interaction with a focus on the constitutive role of other communicative modalities, like gestures, postures and the use of contextual features. Since Goodwin's insights, a great amount of CA research has adopted an embodied approach to illustrate the interplay of talk, bodily conduct and material resources in the accomplishment of social action and activities (Heath and Luff 2013; see also Streeck 2010, 2011; Streeck et al. 2011), thus significantly

contributing to reduce the so-called "logocentric bias" (Erickson 2010).

2.1. The "Ventriloquial Perspective" and beyond

We owe to François Cooren (2010, 2012) a "ventriloquial" perspective on communication that grasps the co-constitutive relationship between human activities and material features, accounting for how artifacts, tools and architectural elements contribute to human actions and practices. Building on Latour's theoretical framework (Latour 1986, 1996), and in line with research on family everyday life and the domestication of goods (see among others Caron and Caronia 2001, 2007), the ventriloquial perspective assumes that the accountable character of people's activities depends on a form of "material agency", i.e. the constitutive role of things in making a difference in the unfolding of interaction (Pickering 1995). By stressing that sense-making results from the contribution of both human and non-human entities and meaning is "said" by humans as well as (although differently) by things, the ventriloquial perspective contends that we routinely act as if things spoke to, for and even despite us. Giving things back their role in the making of the social, this perspective acknowledges the plethora of entities that – far beyond what is visible in language and *talk*-in-interaction – actively shape, channel or even impede people's actions.

However, by posing the methodological mandate of never leaving the *terra firma* of interaction (Cooren and Bencherki 2010), the ventriloquial theory fails to take into account the contribution of artifacts when participants *do not exhibit any particular public, ostensible and traceable orientation* to the material features of the setting (e.g. the spatial organization or the objects that seem to just be there, as an inert part of the background, see Cicourel 1980, 1992). To overcome this limit, more recently Caronia (2015, 2019) added to this line of inquiry by setting the theoretical premises and methodological conditions for the analysis of "unmarked objects", i.e. objects that, despite being visibly present on the scene of dialogue (Cooren 2010), are not attended to by the participants in any ostensible way. By re-legitimizing the analyst's point of view and cultural competence "in the local production and […] accountability of the phenomena of order he is studying" (Garfinkel 2002, 175), she proposes relying on it to complement the members' (displayed) perspective when this seems uninformative. This approach entails decentering the analytical position (Caronia and Cooren 2014) and taking context into account beyond what is demonstrably relevant for participants (Schegloff 1987, 1997).

3. The socio-material approaches in education

The sciences of human development and education have been particularly sensitive to the role of materiality in social practice, and in some respects forward-looking. The organization of time and space as well as the artifacts inhabiting this space have long been conceived of as "mediators", i.e. cultural products endowed with meanings and composing an "expert system" (Salomone 1997) where cultural knowledge and everyday praxis shape each other. Since Maria Montessori's theoretical analysis of the spatial and material organization of context as a learning tool (see the notion of a "prepared environment", "*ambiente appositamente preparato*", Montessori 1950) and Paulo Freire's inspired "Institutional Pedagogy" (Oury and Vasquez 1967), relevant approaches to formal education have paid attention to the pedagogical setting as a system of socio-material constraints and possibilities, channeling certain courses of action rather than others and, therefore, conveying specific ideologies and cultural models (e.g. the children's autonomy vs. dependency; cooperation vs. competition etc.). Since then, the rediscovery of two theoretical frameworks further sustained the interest for the socio-material components of education as well as a suspicion about an anthropocentric, hyper-humanistic view of education (Caronia 2011). These frameworks are: Vygotskij's socio-historical perspective on human development and learning processes (Vygotskij 1962[1934]), and Foucault's notion of 'governmentality', i.e. the wide range of techniques enacting social control and shaping individuals' conduct in everyday and institutional contexts (e.g. schools, families, prisons, hospitals).

The late discovery of Vygotskij's theoretical approach had two major consequences for the understanding of human development. Firstly, it led to renewed attention to social interaction and language use as a crucial means for learning and socialization; secondly, and most importantly for our purposes, it made relevant the role of material artifacts, or "mediation means" (Wertsch 1985, 1991). As Wertsch and Rupert (1993) point out, Vygotskij's category of "cultural artifacts" was by no means restricted to language (although it was undoubtedly Vygotskij's primary focus); rather, it also included artifacts (e.g. maps, diagrams, mnemonic aids etc.). Following Vygotskij's emphasis on cognition as an interactional process embedded in the socio-cultural material world, a significant amount of empirical research has been devoted to investigating how education and learning processes are situated in a specific environment and distributed among different agents (see among others, Lave and Wenger 1991; Pontecorvo 1993, 1999; Pontecorvo et al. 1991, 1995, 2001; Goodwin 1994, 2007).

Research interest for the socio-material components of the educational setting has also been strongly influenced by the spread of Foucault's ideas on the ways the State shapes individuals' bodies and social life. Building on the Foucauldian notion of "*dispositif*" (i.e. an aggregate of institutional, physical and administrative ways of ordering things which allows action, understanding and even the exercise of power in a community, Foucault 1975), Massa's notion of "educational dispositive" (1986, 1987) laid the foundations for the contemporary post-humanistic view on education (for an overview see Riva 2016). According to this perspective, education is a material and social event, made possible by a series of heterogeneous, human and non-human elements (see Massa 1990; Barone 1997; Barone et al. 2014; Mantegazza 1998, 2001). The "educational setting", i.e. the visible side of the "pedagogical dispositive", is one of the clearest exempla of a social site where "matters matter" (Cooren et al. 2012).

Contemporary socio-material approaches in education have also been inspired by the Actor Network Theory (see, among others, Fenwick and Edwards 2010, 2012). According to the "principle of symmetry" (see Callon et al. 1986; Latour 2005), educational research adopting this theoretical sensibility considers learning practices as rooted in, and emerging from, hybrid socio-material networks (or "*hybrid collectifs*", Latour 1999), where agency is distributed and meaning develops from the specific combination of the different actors in the scene.

While the research and theoretical approaches outlined above have focused mainly on formal education in institutional settings (see, among others, Barbanti 2019; McGregor 2004; Roehl 2012; Landri and Viteritti 2016), growing attention has been paid to so-called "informal education". Building on Cole's perspective (1995), this line of inquiry assumes that any artifact is, at the same time, material and ideational: it channels human activity through its very material affordances (Norman 1988; Gibson 1979, 1977) and concurrently displays the culture and history of the community that produced it. Therefore, the presence, absence or modes of existence (Cooren and Malbois 2019; Latour 2013) of the artifacts in the scene inevitably convey meanings and suggest preferred practices. In other words, artifacts *educate* people. For example, Tramma (2009) stresses the educational function of materiality in everyday mundane experiences (e.g. accessing the media) and contexts (e.g. the city with its buildings, streets, neighborhoods and suburbs). Focusing on domestic spaces, Iori (2002) has investigated spatial and temporal organization as the primary category of family education (see also Graesch 2013). Arnold (2013) has documented the great quantity of objects in

American households, illustrating the key role of "material abundance" in educating people to spend leisure time indoors rather than outdoors.

Surprisingly enough, there is a crucial home-based learning activity that is relatively underexplored as a situated, object-mediated experience: (parent-assisted) homework. Our study fills this gap by clarifying how homework is accomplished as a culturally shaped and interactive phenomenon involving human (i.e. children and parents) and non-human beings.

4. Materiality in action: homework as an artifact-mediated learning activity

On the basis of a large amount of educational research (for an overview, see Hoover-Dempsey et al. 2001), educational policies in many countries have been promoting parental involvement in education (see for example, the Italian Lgs. 297/1994, the US *No Child Left Behind Act* and the Swedish SNAE, 1994/2003, SOU, 1997 and SMER, 2003). The main practices supposed to implement the "family-school partnership" on a regular basis, and allegedly believed to generate positive meso-systemic connections (Bronfenbrenner 1979; Arcidiacono 2013) between family "small cultures" and the school culture (Holliday 1999), are parent-teacher conferences and homework. While the former have already been conceived of and studied as a situated interactive accomplishment (see among others Pillet-Shore 2012, 2015; Caronia and Dalledonne Vandini 2019), homework is still little explored as a socio-material activity (but see Forsberg 2007; Wingard and Forsberg 2009; Pontecorvo et al. 2013). This lack of interest is surprising as the homework activity constitutes a crossroad between the institutional culture of the school and the private cultures of families (Pontecorvo et al. 2013) or, more radically, the main means through which the school voice enters the domestic space on daily basis.

Focusing on naturally-occurring parent-child interactions during homework, in this article we illustrate how homework activity is an interactive and situated learning experience accomplished through, and mediated by, the multiple semiotic resources within a "contextual configuration" (Goodwin 2000, 2007). In the next section we describe the data and analytical procedures of the study.

5. Data corpus and analytical procedures

The data presented in this study are drawn from a corpus of 31 video-recorded homework sessions totaling 942,61 minutes. The five Italian families involved in the project are

composed of two working parents and at least one child aged 6-9 years, i.e. attending the first, second or fourth grade. To reduce the researcher's and the video-recording tools' potential impact as much as possible, the video-tape recording was self-administered by the parents in compliance with the researcher's guidelines. The participants' consent was obtained according to Italian law n. 196/2003 and EU Regulation n. 2016/679 (GDPR 2016/679), which regulates the handling of personal and sensitive data. For the sake of anonymity, all names have been fictionalized.

For the aims of this analysis, data were transcribed according to Conversation Analysis convention (Jefferson 2004) to provide an intermediate level of granularity (Jenks 2011, 43). In line with the multimodal approaches to social interaction (Goodwin 2000) and with the aim of illustrating how interaction is embedded in and emerging from the contribution of heterogenic semiotic agents (for a similar approach, see Mondada 2011), transcriptions have been enriched with notations for gaze, gestures, body movements and orientations to objects. The transcripts in this article are presented in two lines: the original Italian transcript is followed by an idiomatic translation in American English.

6. The performativity of objects and the making of the learning environment

Using an empirical and bottom-up categorization grounded on both the artifacts' affordances (see Caronia 2019) and/or the participants' ostensible orientation to them, video recordings were scrutinized to identify five recurrent functions performed by the objects and exploited by parents and children in the unfolding of their interactions during homework (see Table 1).

Table 1: The performativity of objects in the homework interactional scene

1	Defining the interactional frame as "homework related"
2	Indicating the required activity, inviting the child to perform it
	a) Immediately, i.e. in the first sequentially available slot
	b) Later, in the parents' absence
3	Embodying epistemic and deontic authority (Heritage 2012a, 2012b; Stevanovic and Peräkylä 2012)
4	Displaying the "relevant structure" (Goodwin 2007) in the homework material configuration

5	Providing affordances *representative of* and *functional to* the concepts being studied

We singled out 65 sequences where one or more of these functions are performed. In this article we focus on the first and the second function: "Defining the interactional frame as 'homework related'" and "Indicating the required homework activity, inviting the child to perform it".

In making a case of function number 1, in the next section we focus particularly on how the artifacts actively contribute to defining the ongoing activity as "homework related" even when they are unmarked (i.e. not attended to by participants "here and now" in any ostensible way) and appear to be "just there". By their presence, forms and inscribed function (they are school objects, not objects of just any kind), they create a specific interactional frame and channel the participants' conduct.

In making a case of function n. 2, the following section further illustrates how participants orient to the objects and their inscribed meanings as if they had material agency. We identified two different ways in which parents exploit the agency of objects (i.e. their competence in conveying specific meanings and allowing for certain actions rather than others) to invite the child to perform the required homework activity:

a) The parents manipulate specific artifacts to convey the next relevant homework activity, inviting the child to perform it immediately, i.e. in the first sequentially available slot. By doing so, the parents *share* their agency with these objects.

b) The parents arrange the objects in the homework scene to index what to do (next) and then leave the child alone. By doing so, the parents *delegate* the task of channeling the child's behavior to the objects as if they had the agency to do so.

Despite our main focus on functions number 1 and 2, some of the excerpts presented below also include instances of other functions, as they are often intertwined.

6.1. Defining the frame: the agency of seemingly inert objects in the interactional scene

The first example illustrates how the objects in the environment shape the ongoing interaction, working as "context or action definers" (function n. 1, Table 1). This appears to be the case both when participants use or refer to the artifacts in an ostensible way, and when they do not.

(1) "Enough!"

F2H5 (10.45 – 10.55)

M = Mother

F = Father

L = Ludovico (seven years old, second grade)

L and M are doing the Italian assignment at the kitchen table, while F is fixing stuff in the same room. We join the interaction when L proposes a candidate sentence for the exercise.

Fig. 1


```
1   L    il papà aggiusta il (corridoio)=
         dad repairs the (corridor)= ((looking at F))

2   F    =scrivi con questo
         =write with this ((moving the drill toward the Italian notebook))

3   M    ^dai
         ^come on

4   L    ^((takes the drill)) [fig. 2]
5   L    ((activates it toward F)) [fig. 3]

6        (3) ((L and F play with the drill while M looks at her mobile phone))

7   F    basta
         enough ((taking the drill from L's hands))
8   F    vai
         go ((moving his left hand toward the Italian notebook)) [fig.4]
```

Fig. 2   Fig. 3   Fig. 4

As can be seen in fig. 1, the setting where L and M are doing homework is inhabited by two objects: the blue pen held by L and the Italian notebook lying in front of him, which are respectively the tool and support for writing. Their form, design and inscribed function display the genre they belong to: they are "trans-contextual objects" (Budach et al. 2015) moving with the child between home and school. Their mere presence materializes the sociocultural link between the two settings.

Despite looking toward F and not at the Italian notebook (line 1), L demonstrates his orientation to the homework activity by producing a candidate sentence for the homework exercise (line 1). At this moment, F, who has been mentioned in the child's turn, self-selects as an interlocutor by suggesting that L use the drill for writing the sentence (line 2). Through the merging of the object and the word semantics (he hands the child "a drill to write"), F changes the frame of the ongoing activity (homework): by making the object speak on his behalf, he defines the frame as "playful". Despite M's problematization (line 3), L takes the drill (line 4, fig. 2), then turns it on and moves it toward F (line 5, fig. 3). By doing so, the child aligns to the playful activity frame proposed by F's handing him the drill, and abandons any orientation to the school objects and related homework activity: he doesn't look at the Italian notebook anymore and leaves the pen on the table (see fig. 2).

At this point, all the participants visibly abandon any orientation to the homework activity: M looks at her mobile phone while L and F play with the drill. After three seconds during which none of the participants orients to the school objects or to the homework activity (line 6), F suddenly interrupts the game with the drill (line 7), and orders L to restart his homework ("go", line 8), making the Italian notebook relevant with a hand gesture (line 8, fig. 4).

If F's multimodal directive (lines 7 and 8) appears to be abrupt, we advance that the answer to the golden question "why that now?" (Schegloff & Sacks 1973) can be provided by taking into account the agency of the school objects in the scene, until then unattended (see lines 4-6). Adopting a ventriloquial perspective, we contend that it is the presence of the

school objects in the interactional scene and their inscribed meaning that prompt F to urge L to abandon the game with the drill and return to the homework task. In other words, *even if they have not been made relevant by the participants for a while* (lines 4,5,6), the school objects in the scene have been and still are defining the interactional framework as homework related: their "mere" presence works as an objectual statement that reminds participants what they are there for, and channels their conduct. If the objects, through their mere presence, eventually lead F to speak, the opposite is also true: urging L to get back to the homework activity by pointing to the notebook (line 8), F is making the object speak. In other words, F makes relevant what the object has been and is conveying through its mere presence: the activity to be performed in that interactional environment is homework.

The examples in the next sections illustrate how parents exploit the agency of objects to invite the child to perform specific homework activities.

6.2. Indicating and inviting to perform the required activity

In making a case of function no. 2 (see Table 1), the examples in this section illustrate how material agency is assumed and exploited by parents to tell the child what to do next, and invite him to act accordingly. In particular, parents in our corpus manipulate and arrange the artifacts in the homework setting to invite the child to perform the next relevant homework activity either immediately (i.e. in the next sequentially available slot, function 2a, Table 1) or later (i.e. in the parents' absence, function 2b, Table 1). In the first case, the parents *share* their agency with the objects; in the second case, the parents *delegate* to the objects the agency in telling the child what to do.

6.2.1. Sharing agency with objects

The next example illustrates how, by giving verbal instructions and *manipulating a school object*, the parent multimodally conveys the next relevant action, inviting the child to act accordingly (function n. 2a, Table 1).
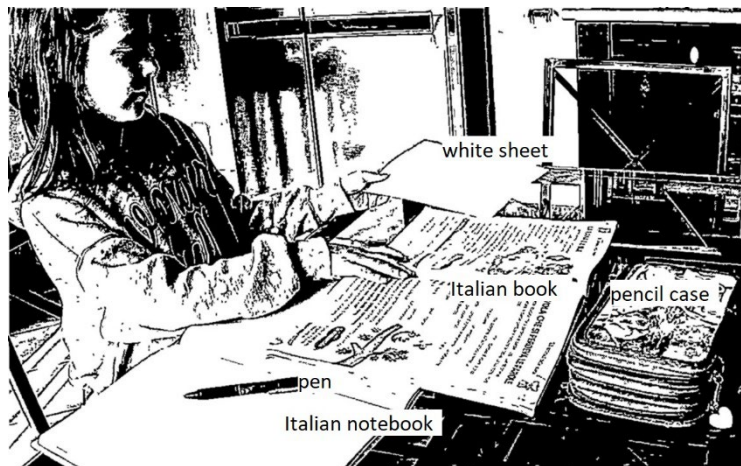
(2) "Ok, write it down now"

F3H1 (06.27 – 07.00)

M = Mother

B = Benedetta (seven years old, second grade)

B has just finished reading the assigned text in her Italian book. Now, she and M start doing the related exercise.

Fig. 5


```
1   M   ok (.) ^allora (.) la prima domanda?
        ok (.) ^well (.) the first question?
2   M           ^((moves close to B))

3   B   ci sono- chi sono i personaggi della favola?
        there are- who are the characters in the fairy tale? ((readi

4   M   mh

5   B   i protagonisti sono <il bue e la  ra:^na>
        the protagonists are <the ox and the ^fro:g>
6   B                                    ^((looks at M))

7   M   ok   scrivilo    ^mò
        ok write it down ^now
8   M                    ^((moves the book to the side))[fig. 6]

9   B   ((takes the pen))
```

Fig. 6

The sequence opens when B has just finished reading the assigned Italian text. In the turn at line 1, M verbally introduces a new phase of activity through the discursive markers "ok" and "well" ("*allora*" in Italian, Bazzanella et al. 2007) and by asking B to read the question in the following exercise ("the first question?"). Concurrently, M moves close to B (line 2), thus establishing a cooperative participation framework (Goodwin and Goodwin 2004). B reads the question in the book (line 3) and, after M's minimum feedback inviting her to continue (line 4), she produces a candidate answer (line 5). By looking at M (line 6), B demonstrates her orientation to M's evaluation of her answer.

Through the positive evaluation ("ok") and the following directive ("write it down now", line 7), M verbally ratifies B's answer as appropriate. Concurrently, she moves the Italian book to the side (line 8, fig. 6) uncovering the Italian notebook where B must write the answer. Thus, M constitutes the Italian book as unnecessary for the child's next action and, by making the notebook visible, she constitutes the actions it affords (i.e. writing the answer) as sequentially relevant. In other words, by manipulating the Italian book, M creates the material conditions for B to perform the verbally required next action (i.e. writing the answer in the notebook, line 7). By using the Italian book and notebook to multimodally convey the next relevant action, M "makes the objects speak", i.e. she verbally reports the assignments that they index. Yet the objects make M speak too: the presence of the school artifacts in the scene (and the school-related values they stand for) leads M to engage in the homework activity to help B carry out the Italian assignment. B immediately aligns to M's multimodally conveyed directive by displaying that she is ready to start writing (line 9).

The next example further illustrates how the parents exploit the agency of objects in indicating and inviting to perform the next relevant activity (function n. 2a, Table 1). This excerpt also shows how the object can be convoked by a parent to highlight its "relevant structure" (function n. 4, Table 1).

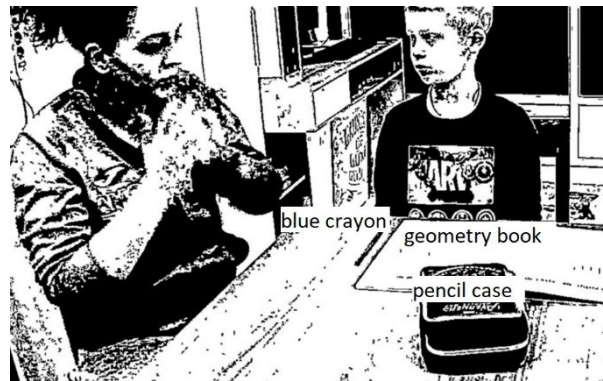(3) "Every figure has to have the interior region colored differently"

F2H1 (04.25 – 04.45)

M = Mother

L = Ludovico (seven years old, second grade)

M and L are sitting side by side doing the geometry assignment. We join the conversation when M has just finished reading the exercise instructions and starts recapitulating them for L.

Fig. 7

blue crayon   geometry book   pencil case

```
1  M   quindi ^ogni (.) °e:° figura deve  avere  un-
       so    ^every (.)°e:° figure has to have a-
2  M              ^((points one by one to every figure on the page))
3  M   ^la     regione    ^^interna colorata diversamente.
       ^the    interior ^^region  colored   differently.
4  M   ^((moves the pencil case close to L))[fig.8]
5                    ^^((opens the crayon compartment with a sweeping gesture))[fig. 9]

6  L   ((brings the pencil case closer))[fig.10]
7  L   ((takes a crayon from the pencil case))
```

Fig. 8   Fig. 9   Fig. 10

After reading and explaining the exercise instructions (not transcribed), M starts recapitulating them (lines 1) while pointing to the three figures on the homework page one by one, thus making the referents of her talk explicit (line 2). Through this gesture, M selects and highlights the "relevant structure" in the specific homework setting (Goodwin 2007), i.e. the material configuration on the homework page that is relevant for L to carry out the

appropriate action (function 4, Table 1). By recapitulating the exercise instructions and making its relevant structure visible, M significantly scaffolds L in carrying out the geometry assignment.

While continuing her instructive turn (line 3), M moves the pencil case close to L (line 4), thus constituting it as relevant for the child's next activity. Then, she opens the crayon compartment with a sweeping gesture (line 5, fig. 9). Through the sweeping gesture, M turns her action into a "performance" (Streeck 2011), thus making the connection established between the object (i.e. the pencil case) and the ongoing interaction unequivocally relevant. In this way, M shares with the pencil case the agency of telling L what to do next. By using this object to indicate the next relevant activity, M gives relevance to one of the courses of action that it indicates and allows (i.e. writing). By doing this, M makes the object work as a sign: in some sense, she gives it a voice. However, the reverse is also true: the presence of the pencil case, together with the cultural, school-related values it embodies, leads M to use it as a means to carry out the homework activity. At the end of M's turn, L aligns to the gesturally conveyed directive by bringing the pencil case closer (line 6, fig. 10) and taking a crayon (line 7).

The following section illustrates how parents rely on the artifacts in the setting, i.e. on their position, affordances and meanings, as a means guiding the child toward the completion of the required assignments.

6.2.2. Delegating agency to objects

The next example shows how, in anticipation of her absence, the parent assumes and exploits the material agency by delegating to objects the competence in inviting the child to perform a sequence of assignments (function n. 2b, Table 1).

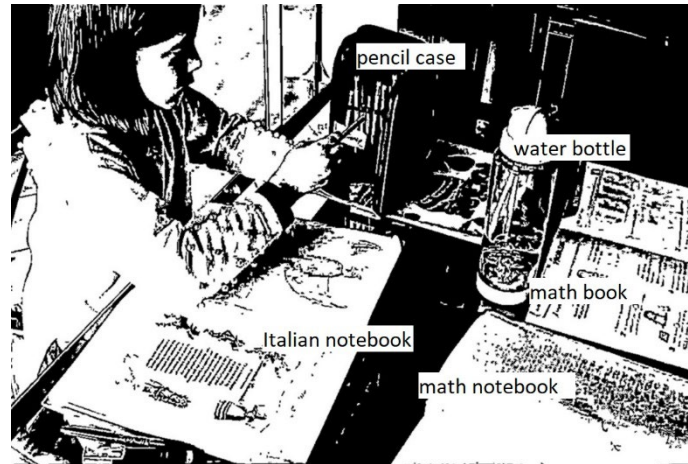(4) "First you do the calculations then later you show me the problem"

F3H6 (54.05 – 54.25)

M = Mother

B = Benedetta (seven years old, second grade)

B is doing her homework at the kitchen table when M approaches her and announces she's about to leave her alone for a while.

Fig. 11

```
 1  M  Betta vado fin  ^su, a  sistema^^re:
       Betta I'm going ^upstrairs, to ^^do:
 2  M                         ^((moves the water battle to the side))[fig.12]

 3  M                                       ^^((slightly moves the math book closer
       to B))[fig.13]
 4  M  ^il bucato intanto ok?
       ^the laundry in the meantime ok?

 5  B  ^((looks at the math book))
 6     (0.7)

 7  B  [°(ma  sono   stanca)° ]
       [°(but  I'm  tired)°   ]

 8  M  [tanto    devi    fare,]- ^prima fai le operazioni=
       [anyway you have to do,]- ^first you do the calculations=
 9  M                         ^((touches the math notebook))[fig.14]

10  M   =^poi dopo mi fai vedere il  proble^^ma?
        =^then later you show me the proble^^m?
11  M    ^((points to the problem instructions on the book page))[fig.15]

12  B    ^((looks at the book page))[fig.15]
13  B                                        ^^((nods))

14  M  ^e    poi   ripassiamo   le   tabelline    ^^ok?
       ^and  then  we  will revise  the  times tables   ^^ok?
15  M  ^((turns the open math book toward B))[fig.16]
16  M                                              ^^((puts the
       math book partly under the math notebook))[fig.17]
17  M  ((goes away))
```
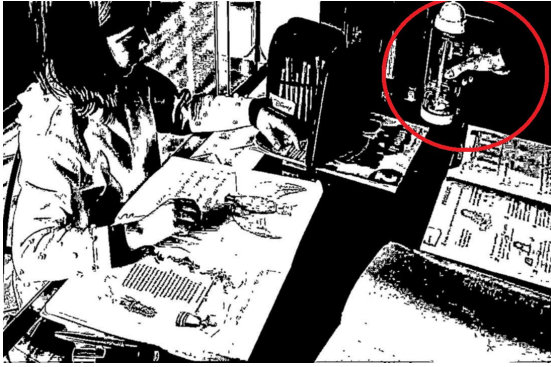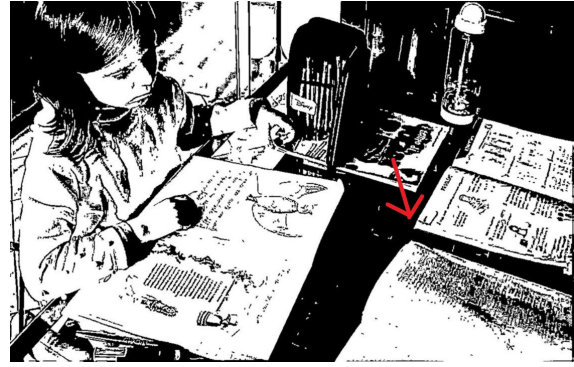
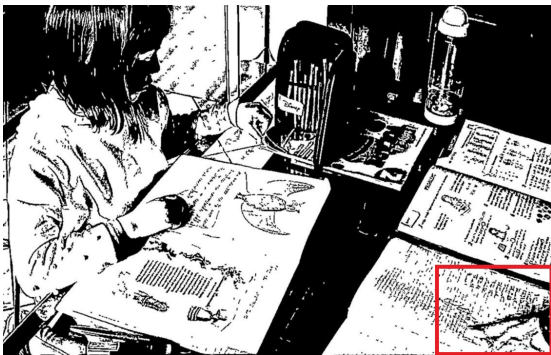Fig. 12   Fig. 13
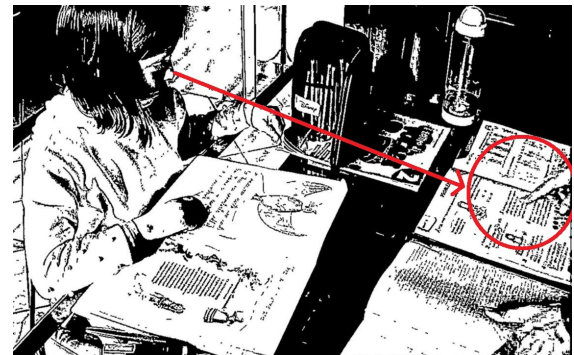
Fig. 14

Fig. 15

Fig. 16

Fig. 17
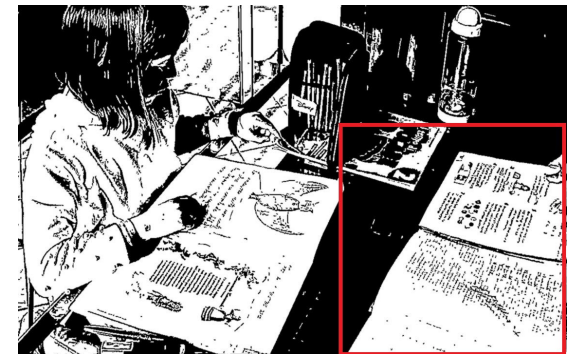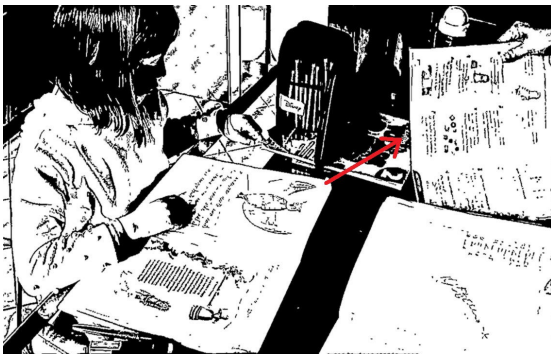
The episode begins when M announces she is about to leave the kitchen ("Betta I'm going upstairs", line 1), concurrently moving the water bottle to the periphery of the homework setting (line 2, fig. 12). Through this gesture, M does two different things: she marks the water bottle as unnecessary for B's homework activity, and removes the separation (embodied by the water bottle, see fig. 11) between the objects the child is focusing on at the moment (i.e. the Italian notebook and the pencil case) and those she is going to use later (i.e. the math book and notebook). While continuing her announcement (lines 1 and 4), M also moves the

math book closer to B (line 3, fig. 13). Through these little movements, M draws the child's attention to the school objects in the scene (see where B is looking, line 5), thus prefacing her incoming turns about homework planning.

After a short gap (line 6), and in overlapping with B's whispered objection (line 7), M produces a directive ("anyway you have to do", line 8), then immediately changes her interactive trajectory (see the interruption and self-repair) to propose a planning of the homework activities in the form of a request ("first you do the calculations then later you show me the problem?", line 10). While proposing the homework plan, M points to the school objects on the table. Specifically, while uttering "first you do the calculations" (line 8), she touches the math notebook where the calculations are (line 9, fig. 14) and while uttering "then later you show me the problem" (line 10), M points to the problem instructions on the book page (line 11, fig. 15). By pointing to the objects and verbally formulating the relative homework assignments, M lends her voice to the objects and makes them utter the plan of the required activities. However, it is undeniable that the books and the school assignments they stand for animate M, leading her to support B in the homework activity.

After B's display of understanding (line 13), M adds another activity to the planning ("and then we will revise the times tables ok?", line 14). While proposing this additional activity, M turns the open math book toward B (line 15, fig. 16) and partly puts it under the math notebook, thus making visible only the pages where the calculations and the problem instructions are (line 16, fig. 17). Through this material arrangement, M makes visible and therefore relevant some specific pages of the book and notebook, thus conveying that B should do the assignments on the pages made visible by the new disposition of the objects.

By carefully arranging the artifacts, M sets a sense-making material configuration, where the objects embody, and channel the child into, the agreed sequence of homework activities. In other words, M delegates to the objects the agency of telling B what to do in her absence (note that M is about to go upstairs, see lines 2 and 17).

7. Discussion

Adopting a ventriloquial perspective on communication (Cooren 2010, 2012) and in line with the contemporary renewed attention for the resources that make the contextual forms of learning visible and intelligible (Streeck 2010; Streeck et al. 2011), we discussed and showed how the accountable and intelligible unfolding of parent-child interactions during homework presupposes material agency (Pickering 1995). In order to analyze *how* and *to what extent* the

material features of the specific homework setting contribute to shaping parent-child interactions and the ongoing homework activities, we proposed to decenter our analytical position (Caronia and Cooren 2014) and observed talk-in-interaction also "on the side of things" (Caronia 2019). Specifically, we illustrated two functions whose performance appears to be distributed between human and non-human participants involved in homework: defining the interactional frame and inviting to perform the next relevant activity.

As the above-analyzed examples show, the objects populating the interactional setting make a difference in the unfolding of interaction, even when not ostensibly oriented to by the participants "right here right now" (ex. 1). Through their mere presence, the artifacts in the scene do several things: they a) constitute a cultural and material link between the domestic and school settings, b) contribute to defining the context and the activity at stake, and c) indicate and delimit the range of possible and expected courses of action. In short, they constitute the interactional setting, i.e. a dense semiotic environment that (materially) sets constraints on and possibilities for the participants' activities by making relevant certain courses of action rather than others. This meaning-making function is particularly evident and more easily analyzable when it is presupposed and exploited by the participants in their visible conduct.

In our data, parents routinely assume and use the objects' agency to (re)define the activity framework and/or to invite the child to perform the next relevant activity. For instance, through the displacement of the object, coupled with instructive verbal turns, parents indicate the required object-related homework activity and constitute it as sequentially relevant. Thus doing, the parents *share* with the object the agency in telling the child what to do next (see ex. 2 and 3). Material agency is also presupposed and exploited by parents when they thoughtfully arrange the objects in the interactional scene and then leave the child alone in the purposely set material space (ex. 4). In doing so, the parents create a sense-making, intentional environment inhabited by "guiding objects", and *delegate* to it the agency in indicating the sequence of assignments and inviting the child to act accordingly.

In all the excerpts we analyzed, artifacts are treated by parents and children as entities endowed with meanings and making a difference in the unfolding of interaction. Therefore, the accomplishment of the ongoing activity cannot be reduced either to humans, or to artifacts: rather, it should be attributed to the *hybrid agent* that they both constitute in and through the interaction (Cooren and Bencherki 2010; Caronia and Cooren 2014).

8. How the school culture enters family cultures through words and things: concluding remarks

Home and school are crucial and permeable social contexts for children's development (Pontecorvo et al. 1991; Contini 2012): they are inhabited by people and things that cross their boundaries every day, favoring (or not) a homeostatic balance between school culture and home cultures (Marsico, 2013). Although we tend to consider human interaction (namely, parent-teacher communication, see for example, Amadini 2019) as the main means for the implementation of such an allegedly positive homeostatic relationship (Pati 2018), it is also embodied in and enacted by a plethora of humble, taken-for-granted objects that inhabit both scenarios: pens, exercise books, pencil cases and diaries (Barbanti 2019). As our study illustrates, these objects materialize the socio-cultural link between family and school: by scaffolding parents and children's joint homework activities, and concurrently incarnating school values, these objects invite parents and children to align with the school culture.

If material agency stands out in our data, parents' competence in exploiting it in ways that are aligned with the school culture and potentially effective for the child's learning processes is also evident. For example, parents appear to be oriented to the school objects' affordances when they point to or move them to indicate "doing homework" as the preferred activity. It is precisely by relying on the affordances and inscribed meanings of these "talking objects" (Caron and Caronia 2007; Caronia 2014, 2015) that parents in our corpus *make the objects state moral values and expectations* (e.g. homework has priority over concurrent activities). In so doing, they ostensibly align with the "school culture" inscribed in and voiced by these objects. Yet, we can also conceive of parents as *being made to speak* by these objects: the artifacts and the values they reify animate parental behavior in interaction in ways that are consistent with the school culture. In a few words, we claim that both objects and parents animate and are animated by the voice of the school. Consequently, we propose thinking of both human and non-human agents as cooperating in socializing the child to the school values respectively assumed and conveyed as obvious and unquestionable premises of the locally produced activity. As our study illustrates, it is in and through ordinary practices, such as object-mediated interactions that underpin parent-assisted homework, that the "home-school alliance" is presupposed, (re)constituted and conveyed (or even potentially challenged) on a daily basis.

Once we acknowledge the constitutive role of socio-materiality in interaction and the hybrid and distributed character of agency in learning-oriented activities, a socio-pedagogical issue emerges. It concerns the cultural capital embodied in the learning environment

(Bourdieu 1986; Latour 1987) as well as the crucial competence of the caregivers in exploiting the material agency in ways that are aligned with the school culture (Weininger and Lareau 2003). In other words, if the school relies heavily on a family learning environment inhabited by culturally aligned, competent socio-*material* actors, what about those children who cannot rely on these resources?

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