Popularizing the Covid-19 pandemic to young children online: A case study

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ABSTRACT

This study applies the notion of popularization to assess how the Covid-19 pandemic is explained to young children. The analysis is carried out on two corpora: texts providing advice to parents on how to talk to their children about Covid-19, and texts aimed directly at children. The research is informed by studies on specialized knowledge dissemination, medical and scientific popularization and health literacy, contributing to the growing body of research on popularization to children. All corpora contain texts in English, with smaller subcorpora of Italian and Russian texts to provide contrastive remarks, where applicable. The findings focus on definitions of key concepts and on their metaphorical framing, including reliance on the pre-existing knowledge of children realized through similes. The quality of popularized materials for children (and their caregivers) is problematized on account of several misconceptions introduced in definitions. Finally, it is argued that personification is the most frequent and distinctive strategy of popularization to children, as opposed to texts targeting their parents relying on a wider range of popularizing strategies, and could be added as a separate category to the existing theoretical framework.

Keywords: popularization, children, Covid-19 discourse, personification, knowledge dissemination.

1. Introduction

The discourse of Covid-19 has firmly entered our vocabularies, and it has become normal to hear elements of the so-called 'coronatalk' in everyday conversations, on screen, in the streets and virtually everywhere. The pandemic has left a profound impact on the wellbeing of children (de Figueiredo et al. 2021), also on account of their exposure to

indiscriminating and unparcelled information, frequently leading to fear and misconceptions. UNICEF invites parents and caregivers to "explain the truth in a child-friendly way" (Hunt 2020), but what is considered to be 'child-friendly'?

The 'friendliness' or accessibility of knowledge may be achieved through the mechanism of popularization (Calsamiglia – van Dijk 2004; Garzone 2020), which is most frequently conceptualized as knowledge transformation and recontextualization along the 'specialized-lay' continuum (Calsamiglia – van Dijk 2004: 370) addressing the non-specialist (and implicitly adult) audience (Gotti 2014: 16). Whereas there are multiple studies on medical/healthcare popularization for adults (Calsamiglia – van Dijk 2004; Hyland 2010; Gotti 2014; Anesa – Fage-Butler 2015; Garzone 2020; Nikitina 2020), literature on medical/healthcare popularization for children is limited. There are some studies targeting popularization to children in the legal domain (Diani 2015, 2018; Diani – Sezzi 2019; Engberg – Lutterman 2014; Sorrentino 2014), in the tourism and environmental issues (Cappelli 2016; Bruti – Manca 2019; Cappelli – Masi 2019) and in the scientific domain (Cesiri 2019), with most works on the dissemination of scientific knowledge approaching the issue from the pedagogic standpoint (Heisey – Kucan 2010; Hoffman et al. 2015).

This study intends to contribute to the growing body of research on (medical) popularization to children, by assessing how coronavirus and Covid-19 are explained in free publications online. Section 2 outlines the theoretical-methodological framework of popularization, overviewing the literature on medical popularization for adults (2.1), on popularization for children (2.2) and outlining the classical popularization strategies (2.3). Section 3 describes the study design and materials. The findings are presented and analyzed in Section 4. Finally, Section 5 provides discussion and concluding remarks.

2. Popularization

2.1 Medical popularization to adults

Medical popularization is closely linked to the idea of health literacy (Turnbull 2015; Garzone et al. 2019). One of the most authoritative definitions of health literacy developed by Ratzan and Parker (2000) for a National Institutes of Health (NIH) publication states that health literacy is "the degree to which individuals can obtain, process, and understand basic health information

and services needed to make appropriate health decisions". As emerges from this definition, there is a slight difference between health communication and medical/healthcare popularization which concerns their purposes (Turnbull 2015: 248), as the former emphasizes the decision-making empowerment of the receivers. Even though young children typically do not take decisions on their health, the decision-making element is important for covert addressees of any child-related publications, i.e., their parents and caregivers. Popularization to children is connected to health communication to parents as the main caregivers of pre-school and primary school children. Online health communication to parents as caregivers through the lens of discursive practices of knowledge dissemination and popularization is a relatively underresearched area (Cavalieri – Diani 2019: 93) and a rather hot one as Google Trends[1] demonstrate: "coronavirus for children" was one of the most researched topics in the period of major outbreaks between 15 and 21 March 2020 and between 7 and 15 March 2021.

2.2 Popularization to children

Popularization to children is conceptualized in this study as a set of discursive practices that enhance children's understanding of specialized scientific knowledge involving "'mediation' between experts and non-experts having a different stage of cognitive development" (Diani – Sezzi 2019: 203).

Similarly to traditional 'adult' popularization, it involves knowledge mediation and recontextualization (Diani – Sezzi 2019: 215), where specialized and difficult to access scientific knowledge is managed, reformulated and put in a different context catering for different participants. In contrast to popularization to adults, medical popularization to children, on account of their limited experience, cannot rely extensively on their previous knowledge (Cesiri 2019: 225) or solid cognitive "infrastructure" (Cappelli 2016: 71) to process complex notions of medicine and health. As a consequence, popularizing science and biomedicine to children, especially controversial topics, is a kind of a discursive predicament: on the one hand the public is intolerant to open discussion of many adult topics (Massarani 2008), and, on the other hand, popularizing authors face the risk of oversimplification, and even trivialization (De Marchi 2007).

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1   https://trends.google.com/trends/explore?date=2021-01-01%202021-12-31&q=
    coronavirus%20for%20children, accessed February 2022.

Young children's – standing here for pre-school or elementary school children's – richest domain of knowledge is that of humans (Inagaki – Hatano 1987: 1019) and they may tend to transfer human-related schemata, or knowledge structures, to non-human subjects (animals) or even inanimate objects, such as robots (Beran et al. 2011). Given the knowledge gap between scientists and young children as well as a potentially limited lexicon of the latter, they tend to perceive new knowledge metaphorically, most frequently through animism and personification (Inagaki – Hatano 1987). The concept of animism developed and studied by Piaget (Piaget 1929; Thomas 2005) for over 50 years represents the attribution of human qualities and behaviour to inanimate objects, whereas personification, or person analogy, is the general tendency to ascribe human attributes, either physical, emotional or behavioural, to non-humans. Beran et al. (2011: 540) demonstrate how the notion of animism, although widely criticized on account of its rigid description of age stages where it manifests itself, can be successfully reapplied as a theoretical paradigm to current research on children's understanding of such ubiquitous industrial phenomena as robots. Given the omnipresence of communication on another inanimate object – the novel coronavirus – it seems appropriate to revisit and apply the notion of animism to the theoretical framework of popularization.

2.3 Popularization strategies

Linguistic and discursive analysis of popularizing discourse is traditionally based on the categories developed by Calsamiglia and van Dijk in 2004. Their pivotal model is widely employed in most studies on popularization (e.g., Diani – Sezzi 2019) and is accounted for in manuals on specialized communication addressed through the lens of popularization and Discourse Analysis (Garzone 2020), which is the main methodological framework for this study. Calsamiglia and van Dijk (2004: 372) identify five popularization strategies that provide 'explanation' for specialized concepts, also known as popularization techniques "on the surface of discourse" (Garzone 2020: 162-165): denomination, definition, reformulation, generalization and exemplification.

Denomination, or designation, introduces new terms with specific meanings, such as the name of the disease – Covid-19 – or "antibodies" in (1), which can be preceded by such markers as "called", "known as", "meaning", "so-called", and "in other words".

(1)   These special 'handcuffs' *are called* antibodies.[2]

Definition explains unknown words, and is quite similar to description, i.e., explanation of unknown things. Definition is a complex strategy which can be realized linguistically in multiple ways. In this research I draw on the overview of definitions by Nikitina (forthcoming) that is inspired by the definitional categories elaborated by the International Organization for Standardization (ISO 1087: 2019): (a) *intensional* definitions, also known as *analytical* or *genus et differentia*, where *genus* stands for a macro-class of the defined object such as "substance" in (2) and *differentia* names its distinguishing features (underlined in (2)); (b) *extensional* definitions, which enumerate objects that fall under the definition of the concept defined, often in a partitive relationship as in (3) (note also denomination), and (c) *definitions by implication*, which describe a term in an operational way by its usage, function or application in a particular context, and hence are frequently introduced by action verbs, such as "triggers" and "produces" in (4).

(2)   Vaccine: A *substance* – almost always a liquid – <u>that contains a part of the virus, or the virus itself, but is no longer capable of causing the disease</u>.

(3)   Human cells *contain DNA*, while several organisms have a slightly different genome, called RNA.

(4)   Vaccine […] *triggers* an immune response and *produces* antibodies.

Reformulation, or paraphrase, changes the surface structure of a given fragment to make it more accessible to the receiving public, frequently marked by metalinguistic expressions preceding or following a term such as "that is", "that is to say", "i.e.", "in other words". Reformulation may also be graphically marked, e.g., by putting the paraphrase in brackets as in (5).

(5)   A protein *(small molecule produced by cells)*, which has a shape and size that is complementary to a part of a virus.

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[2]   All examples in this subsection are taken from the corpus, specifically from *A curious guide for courageous kids – the vaccine*, published in 2021 by the Italian network of children's museums. Emphasis has been added in all examples throughout this article.

Generalization refers to the general category, such as "the cow disease" to refer to cowpox or "the human disease" to refer to small pox in (6).

(6)   But *the cow disease*, which was called cowpox, was milder than the one found in humans, known as smallpox. […] milkmaids who became infected with cowpox didn't become sick with *the human disease*, which was more severe and more contagious.

Mentioning any communicable disease to explain Covid-19 would already constitute an instance of generalization. It is thus difficult to separate in a clear-cut way generalization from an intensional definition, where the *genus* would always pertain to the macro-class of the concept defined. It is thus implied that whenever this research identifies intensional definitions, they contain elements of generalization, which are not discussed separately.

     Exemplification (7) illustrates a general problem in a specific way. It can be marked by such expressions as "for instance", "for example", "an example is".

(7)   We come into contact with lots of germs, bacteria, and viruses every day, but our immune system usually defends us from these invaders. *For example, certain cells try to 'eat' viruses.*

When exemplification is not marked linguistically and occurs next to a specialized concept, it may be difficult to separate from a definition by implicature. Whenever symptoms of Covid-19 are illustrated, these utterances are treated as definitions by implicature even though it can be argued that they also exemplify how the disease manifests itself.

     In addition to the surface level strategies there are the so-called cognitive (Calsamiglia – van Dijk 2004: 376) or pragmatic-level strategies (Garzone 2020: 166) introduced as 'analogy' or 'association' strategies. This category includes similes – marked by linguistic indicators expressing comparison such as "like", "such as", "similar to", etc. (see example (20) in 4.1) – and metaphors (see 4.2) that conceptualize "one kind of thing in terms of another" (Lakoff – Johnson 1980: 5) without any linguistic markers. The use of metaphors has been defined as "the most conspicuous aspect of COVID-19 communication" (Garzone 2021: 161), referring to communication and popularization to adults.

     With the Covid-19 pandemic, children were bombarded by specialized denominations, such as "coronavirus", "Covid-19", "vaccine", "sanitary measures", "isolation", etc., coming from virtually everywhere without any

structured definitions, leading to logical *wh*-questions. In this study I will focus specifically on definitions of novel concepts and on their discursive and cognitive realizations.

3. Materials and study design

To popularize something means to render it accessible to the general public, hence the easy retrievability of information was the guiding principle behind data collection. Most modern parents search online for preliminary parenting advice, and multiple lockdowns during the pandemic could only exacerbate this tendency. All materials of this study were collected using online search engines in an attempt to replicate information seeking practices which were possibly used by parents during the pandemic. The search expressions employed were "coronavirus for children", "Covid-19 for children", "talk about/explain coronavirus/Covid-19 to children".

The materials for this study comprise two small corpora (see Table 1): 1) advice to parents on how to talk to children about the coronavirus and the Covid-19 pandemic (and vaccines); 2) freely downloadable books and brochures for children explaining the same issues. Although "Covid-19 vaccine" was not a separate search parameter, several publications on Covid-19 vaccines appeared in the search engine and were included in the corpus both in Advice-to-Parents subcorpus (UNICEF 2021; National Geographic 2020, see Appendix 1) and Materials-for-Children (see Appendix 2).

Table 1. Corpus composition

Corpus	Advice to parents			Materials for children		
Subcorpus	English	Italian	Russian	English	Italian	Russian
Texts	5	3	3	14	9	3
Tokens	4,079	2,826	1,856	16,204	13,111	5,227

Each corpus is subdivided into three linguistic subcorpora containing texts in English, Italian and Russian. The corpora contain texts from institutional websites, such as UNICEF (ENG; RUS), Italian Federation of Paediatricians (ITA) and Children's Commissioner (ENG (UK)), Centers for Disease Control and Prevention ("CDC", ENG (US)), governmental websites, as well as texts from webpages of hospitals (Randal Children's Hospital (RUS); St. Jude's

Hospital (ENG; RUS); Policlinico di Milano (ITA)), private clinics (Mayo Clinic (ENG)) and child-related websites (KidsHealth (ENG); PBS Kids (ENG); University of Childhood (RUS); Un pediatra per amico ("UPPA", ITA). As the initial search yielded multiple results of general advice to parents on how to behave with children from a psychological standpoint (e.g., keep calm, check that your child is not stigmatized, etc.), only the resources containing sections dedicated to child-appropriate language and/or answers to FAQ by children were included in the Advice-to-Parents Corpus.

The Materials-for-Children Corpus (see Appendix 2) contains free brochures for children and free books that were originally downloaded from the above indicated resources as .pdf files and then transformed into .docx and .txt files using optical recognition software.

A simple online search allowed me to include only three free books for children in the Russian subcorpus, and all these books were translations, making the Russian subcorpus partially parallel to the English one. There were several other Russian-produced books for children for payment, but since they lacked the criterion of free accessibility they had to be excluded from the analysis. Knowledge transformations in the translation process are notorious. There are also multiple studies that approach popularizing discourse from the translational perspective (Wright 2011; Raffo 2016) including popularization for children (Sezzi 2017). Hence, I decided to keep the Russian subcorpus (and also gathered some Italian/English translations, see Appendix 1) in order to assess whether there are any changes in the popularization strategies employed across the three language versions.

Given the small size of my corpora, the analysis was carried out qualitatively by means of scrupulous examination without the use of any software.

4. Findings and analysis

4.1 Advice-to-Parents

Every text aimed at caregivers introduced at least one 'child-friendly' definition (see examples (8)-(11)), recommending the wording to use in a simulated dialogue or to answer a child's question. On average there were 3.6 definitions per English text and 3.7 definitions per Italian and Russian text, indicating a consonant reliance on definitions across different languages.

(8)   *COVID-19* is the short name for "*coronavirus disease* 2019." *It is a new virus*. Scientists and doctors are still learning about it. (CDC)

(9)   COVID-19 is caused by a germ (virus) that can make the body sick. People who have COVID-19 may have a *cough, fever and trouble taking deep breaths*. (MayoClinic)

(10)   *Questa malattia*, come tutte le influenze e i raffreddori, *si diffonde quando tante persone stanno tutte insieme in luoghi chiusi*, e *parlando, tossendo o starnutendo* mandano in giro goccioline di saliva che potrebbero contenere il virus (UPPA).

        ('*This disease*, like all flus and colds, *spreads when many people stay together indoors*, and by *talking, coughing or sneezing* send around little droplets of saliva that may contain the virus.')[3]

(11)   Koronavirus – *eto takoj virus, kotoryj možet ukhudšit' tvoe samočuvstvie.* (St. Jude's Hospital)

        ('Coronavirus *is such a virus that can make you feel unwell.*')

The texts employ mixed definitional styles, with elements of intensional definitions as in (8) and (11) explaining that coronavirus is indeed a type of a virus that makes people sick, and definitions by implicature, as in (9) and (10), focussing on the consequences and symptoms of contracting Covid-19. No extensional definitions were found, as neither Covid-19 nor coronavirus could be explained by listing their components. The mixed nature of definitional styles may be tentatively explained by a presumed knowledge gap between the popularizing adults and the target audience of children: a child may not know what a virus is, and/or a parent/caregiver may find it challenging to explain it later, hence a classical *genus et differentia* model may not prove to be popularizing at all. At the same time, most young children are familiar with the typical symptoms of a cold or a flu, as they pertain to their personal life experiences. In fact, frequently these definitions are accompanied by what Garzone (2020: 165) labels "explication proper", building on the pre-existing knowledge of children concerning communicable diseases in general, and flu or cold in particular. Linguistically, these are

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3   Literal translations from Italian and Russian made by this author are indicated in brackets below the examples and, for space limitations, are provided only for cases when no official English version exists. Whenever a published translation exists, it is numbered and lettered, e.g., a published translation of example (X) is introduced as (Xa).

most typically realized through similes as in (10) – "like all flus and colds", anchoring new information to pre-existing information. In (12) a simile is used, too, and the popularizer expressly refers to a child's knowledge of communicable diseases to frame Covid-19 as a similar condition, employing also the interpersonal metadiscourse marker "you know" to engage the young readership. Likewise, in (13) explication proper is used to explain vaccines. First, a statement is made about taking medicine to get better which is presumed to be part of the child's pre-existing knowledge base. Next, new information about vaccines is offered through a simile with medicines and a definition by implicature "medicines we take to avoid getting sick in the first place" (underlined in (13)).

(12)   You know what *it's like to have a cold or the flu* – how sometimes you get a cough or have a fever? This is kind of like that. (PBS)

(13)   Ci sono delle medicine che *prendiamo quando stiamo male* e che ci aiutano a sentirci meglio. […] I vaccini, *invece*, sono *come <u>medicine</u> che <u>prendiamo per evitare, in primis, di ammalarci</u>*. (National Geographic)
         ('There are *medicines we take when we are sick* that help us feel better. […] Vaccines, *on the other hand*, are *like <u>medicin</u>es we take to avoid getting sick in the first place</u>*.')

Most scholarly works on popularization observe that it is challenging to distinguish definitions from denominations because "they are so strictly intertwined" especially in cases where there are no linguistic markers (Garzone 2020: 163). Very frequently, these strategies have also been known to co-occur (Cavalieri – Diani 2019: 97). Interestingly, classical denominations, marked by "this means" or "also called" such as in (14) and in (15), are not common in the corpora in general. They occur predominantly in definitions and descriptions of two publications by the Italian network of children museums, already quoted in Section 2.3, which could be idiosyncratic.

(14)   *Zaraznyj – eto značit*, čto virus pereprygivaet s odnogo čeloveka na drugogo, kogda ljudi kašljajut, čikhajut i trogajut drug druga. (RCH/KidsHealth.org)
         ('*Contagious – this means* that the virus jumps from one person to another when people cough, sneeze and touch each other.')

(15)   Ma talvolta queste cellule immunitarie che fanno da soldati hanno bisogno di un maestro. I vaccini, infatti, insegnano al nostro sistema

immunitario come difenderci da nemici pericolosi – *chiamati anche patogeni* – e mantenere il nostro corpo in salute. (National Geographic) ('But sometimes these immune cells that act as soldiers need a teacher. Vaccines, in fact, teach our immune system how to defend ourselves from dangerous enemies – *also called pathogens* – and keep our body healthy.')

The distribution of difficult scientific concepts, such as "lymphocytes", "T-cells", "herd immunity", "immune system", etc. was skewed, as these occurred only in the text by National Geographic (ITA) on how to explain to children vaccines and their functions. The other texts – in stark contrast to literature on adult popularization strategies – frequently lacked denomination. For instance, concepts such as "healthy practices" or "social distancing" were rephrased, explained and exemplified, but not denominated, as in simulated dialogues in (16) and (17) respectively. It is felt that the choice of whether to designate new concepts with specialized terms or to paraphrase them was left to the discretion of parents/caregivers.

(16)   *Est' vešči, kotorye pomogut nam ne zabolet'*, naprimer, esli my budem myt' ruki. (Universitet detstva)
('*There are things that will help us not to get sick*, for example, if we wash our hands.')

(17)   Germs like to travel from person to person. Have you ever noticed how kids in your class sometimes get sick at the same time? *If lots of people stay home for a while, it will be hard for the Coronavirus germs to travel to new people* – and that's good news for doctors and nurses who are helping people who get sick. (PBS)

Along with the similes mentioned above, the popularizing strategy of analogy was frequently realized through metaphors. Examples (14) and (17) above show, respectively, how the virus is animated and personified as it "jumps from one person to another" or "like(s) to travel from person to person". In general, the Advice-to-Parents corpus rarely personified the virus on its own. Personification was used predominantly for cells and antibodies to conceptualize the immune system through the metaphor of a defence system (see examples (18)-(19)).

(18)   Il nostro corpo sa *difendersi*, […] al suo interno ci sono *tantissimi soldatini* in grado di *combattere contro i germi*… anche contro i germi ancora più *cattivi* di quelli che stanno girando in questo momento. (UPPA)

('Our body knows how to defend itself, […] inside there are *many tiny soldiers* able to *fight against germs… even against germs that are even* worse than those that are flying around at the moment.')

(19)   Il nostro sistema immunitario è *il sistema di difesa* del nostro corpo, e le cellule immunitarie sono i *soldati posti a fare da guardia. I soldati combattono vari invasori*, come ad esempio virus e batteri, che vogliono *impossessarsi* del nostro sistema immunitario e farlo *prigioniero*, che è poi il motivo per cui ci ammaliamo (National Geographic)
('Our immune system is our body's *defence system*, and immune cells are the *soldiers placed to stand guard. Soldiers fight various invaders*, such as viruses and bacteria, who want *to take over* our immune system and make it *prisoner*, which is why we get sick.')

Within the BODY AS A DEFENCE SYSTEM metaphor, the virus is personified as an "enemy"/"invader" who can imprison our body. Our immune system (see also an intensional definition and a designation in (19)), is then personified through the metaphor of soldiers who "fight", "stand guard" and "defend" our bodies. This metaphor is particularly prolific in the Italian subcorpus. The idea of protection is advanced also through a simile with a shield (20) in one of the most authoritative sources – UNICEF; however, no other personifications follow.

(20)   A vaccine is *like a shield that protects you* from an illness. (UNICEF)

Interestingly, the defence metaphor runs in parallel with framing vaccines as teachers/trainers, again relying on an idea of learning familiar to children (21; 22).

(21)   Vaccines teach your body how to *fight off* illnesses. They do that by putting a tiny piece of the germ that causes the illness you need *protection from* (or something that looks like the germ) inside your body, so your <u>body can learn</u> what it needs to do to *fight it off*. (UNICEF)

(22)   Questo fornisce al nostro *sistema di difesa* un nemico facile contro cui *combattere* e <u>allenarsi</u>, per far sì che quando poi una forma pericolosa di germe tenti di infettare il corpo, i *soldati* siano già <u>pronti e addestrati</u> a *combatterlo*. (National Geographic)
('This provides our *defence system with an easy enemy to fight* and <u>train against</u>, so that when a dangerous form of germ attempts to infect the body, the *soldiers* are <u>ready and trained</u> to *fight* it.')

4.2 Materials for children

The texts for children addressed the issue either as a story (50% of texts in English; 78% in Italian and 66% in Russian) or under the question-answer form (36% of texts in English), or combined the story elements with the FAQs (14% of texts in English; 22% in Italian and 33% in Russian). The texts addressing the topic as answers to children's questions relied on the strategy of definition (23-27) and included precise denominations.

(23)   Coronavirus *is an illness* that affects people's breathing and lungs. It can be spread from person to person by coughing or by touching surfaces or areas of skin that have been contaminated by the virus. (Children's Commissioner)

(24)   Virus: *A microscopic organism*, even smaller than bacteria, which cannot live on its own, but enters cells and takes advantage of their ability to live and multiply, often causing very harmful diseases (A curious guide for courageous kids – the vaccine)

(25)   *COVID-19* is *a kind of virus*. It can survive inside people. (What is Covid-19?)

(26)   Coronavirus is *a kind of illness*. It's *also called* COVID-19. Some other illnesses are colds, flu and ear infections. I've heard of those! (Clear answers for kids)

(27)   People also talk about COVID-19. *This is the name* of the illness caused by coronavirus. (Trinka's and Sam's Questions)

The definitions in these texts were predominantly of the intensional, or analytical, type, where the concept – coronavirus, virus in general, or Covid-19 – was first denominated and then explained by reference to a generic concept and its delimiting features. Remarkably, many texts defined the concept incorrectly, either on account of oversimplification – confirming the risk already identified in the literature (De Marchi 2007) – or general confusion. As examples (23), (25) and (26) show, coronavirus is frequently explained not by the *genus* "virus" but as an "illness", while Covid-19 is mistakenly conceptualized as a virus and not the disease caused by the virus. Even though it is partially mitigated by the expression "a kind of", frequently occurring also in adult popularization, such imprecision deserves attention.

(28)   *Covid* is an *illness caused by a virus called a coronavirus.* […] But when this completely new coronavirus gets inside a human body, it causes an illness called COVID-19. When people talk about "*catching Covid*", they are talking about this *illness.* (Coronavirus and Covid: A Book for children about the pandemic – 2021 edition)

(28a) But when this completely new coronavirus germ gets inside a human body, it causes an *illness called COVID-19*. When people talk about "*catching the coronavirus*", they are talking about this *illness.* (Coronavirus: a book for children – 2020 edition)

(28b) Ma se questo germe completamente nuovo del coronavirus entra nel corpo di un umano, provoca *una malattia chiamata COVID-19*. Quando la gente parla di "*prendersi il coronavirus*", intende questa *malattia.* (Coronavirus: un libro per bambini)

(28c) No esli *vrednyj* koronavirus popadet v organizm čeloveka, on možet vyzvatʹ COVID-19.
       ('But if a *harmful* coronavirus enters the human body, it can cause COVID-19.')
       (Detskaja enciklopedija: koronavirus)

The phraseology associated with it exacerbates the confusion: it is not uncommon to hear that you "catch the coronavirus" (see 28a and 28b), just as you may catch a different disease. The expression equals the virus and the disease. In fact, the book in question published in 2020 (28a) was re-published in 2021 (27) replacing the phrase "catching the coronavirus" with "catching Covid" to avoid such misconceptions, showing an increased awareness of possible confusion; yet in the Italian translation based on the 2020 edition (28b) the problem remained. It is noteworthy that the Russian version (28c), despite being based on the 2020 edition, does not introduce this misconception in the text, omitting the phrase and opting for a neutral denomination "it can cause COVID-19". It also added a characterizing premodifier "harmful", which could also be rendered as "evil" or "wicked", drawing a more personal picture of the virus. This shows how translation choices can lead to representation deviations and, thus, modify or adapt the popularization strategy involved.

While definitions were present also in stories for children, the most emblematic strategy revolved around metaphors, or better one type of metaphor: personification. All stories for children not only depicted

coronavirus as an animated and living being, but extensively personified it. The virus at times narrated the story from its own perspective (29-30) using first-person pronouns. Other stories had an external narrator, but the virus was always animated (31-32) and depicted as having a nasty character or being a little monster. These definitions were intensional (29) or implicative (31; 32) and contained explicit denominations marked by "my name is", "to call", "called", facilitating children's comprehension of new terms (note the blurred line between the virus and the disease in (29, 31)).

(29)   Hello. *My name* is Covid-19, *my friends* like to call me Corona. *I am* a very small germ, so small you need a BIG microscope to see *me*. (A Message from Corona)

(30)   *I am* a VIRUS, *cousin* with the Flu and the Common Cold. *My name is* Coronavirus. *I like to travel* and *jump* from hand to hand to say "hi". (Covibook)

(31)   Have you heard of *the virus called COVID-19*? It's nasty and vicious. It's sneaky and mean! It can make you feel yucky and feverish, too. But to keep yourself well, there's a lot you can do! (What you can do about Covid-19)

(32)   C'era una volta *un piccolo mostriciattolo di nome: Coronavirus*. È nato qualche mese fa in un paese lontano dalla nostra casa, è minuscolo e vive nello sputacchio delle persone. (Storia di un coronavirus)
        ('Once upon a time there was *a little monster named: Coronavirus*. He was *born* a few months ago in a country far from our home, he is *tiny* and *lives* in the spit of people.')

Interestingly, the Russian translation of "Coronavirus: a book for children" (the 2020 edition) added multiple personifying elements to the text, illustrated in (33) as opposed to the source text in (33a) and the Italian translation in (33b). Coronavirus is defined as a "young" virus using the adjective typically reserved for animated beings; moreover, it becomes the agent ("coronavirus enters") as opposed to being the object ([you] "get the coronavirus"). Similar transformations and recontextualizations are found throughout the book in Russian, where the virus is attributed human behavioural traits such as "making home for itself"/"settling" in our bodies instead of "using your body to make more germs", which was the

source expression. This shows that personification was a strategy carefully selected to popularize, and somewhat dramatize, the topic, added by the translator(s)/editor(s). Although this inquiry is not a translation study, the transformations identified invite further research on parallel corpora.

(33)   Koronavirus – *molodoj* virus, učenye ešče ne izučili ego do konca. […]
        Koronavirus legko pronikaet v naš organizm, esli my trogaem lico grjaznymi rukami: češem nos ili trem glaza, podnosim ruki ko rtu i t.d. […]
        ('Coronavirus is a *young* virus, scientists have not yet fully studied it. […]
        Coronavirus easily enters our body if we touch our face with dirty hands: we scratch our nose or eyes, bring our hands to our mouth, etc.')

(33a)   Because this coronavirus is *new*, scientists don't know everything about it yet. […] It's easy to get the coronavirus germs from inside your body on your hands when you touch your nose or your mouth.

(33b)   Visto che questo coronavirus è nuovo, gli scienziati non lo conoscono ancora del tutto. […] Quando ti tocchi il naso o la bocca, è facile far passare i germi del coronavirus da dentro il tuo corpo sulle tue mani.

Not only is the virus animated, it is also personified through the activation of a number of schemata typically associated with humans in general and young humans in particular: having a family (30) and friends (29; 34), enjoying travel (30; 34), having feelings and thoughts (34), including having fun (35), and even deserving bad marks (36).

(34)   I used to *live* in a bat with *my brothers and sisters*. Fancy that! *My bat and I lived* in a little town in a faraway land. One day *I was bored and wanted to go exploring*. I had heard of lots of exciting places across the seas and really *wanted to travel the world*.
        […] I decided to leave my bat and get into a human. *I set off on a journey with my brothers and sisters to see the world*, we were so excited!
        (A Message from Corona)

(35)   Per evitare che *lui si diverta troppo saltando di persona in persona*, gli scienziati e i medici stanno studiando giorno e notte un modo per sconfiggerlo. Dicono che non bisogna aver così paura di lui, ma essere cauti. Bastano piccoli gesti da parte di tutti per non farlo diffondere. Si chiama prevenzione. (Guida galattica al coronavirus)

(35a)   To prevent *the virus from having too much fun jumping from one person to the next*, day and night, scientists and doctors are studying how to defeat it. They say that we shouldn't be too afraid, we should be cautious. But there is something you can do to keep it from spreading. It's called prevention. (A curious guide for courageous kids)

(36)   […] l'unico che *si merita un brutto voto* qui è il coronavirus… ed è da lui che dobbiamo imparare a tenerci alla larga. (Maestra, come si fa?)
        ('the only one who *deserves a bad grade* here is the coronavirus… and it is from him that we must learn to stay away.')

Single-standing personification of the virus was lacking in the Advice-to-Parents corpus, which makes it a rather distinctive trait of popularizing materials specifically aimed at children and not their caregivers. The notion of "unreasonable personification" may be relevant here. Inagaki and Hatano in their 1987 research, when animism was in vogue for research on child psychology, conducted a number of linguistic experiments asking children aged 5-6 questions about animate and inanimate subjects and compared their answers to the answers of university students. Whenever both children and adults attributed human-like traits to certain subjects, Inagaki and Hatano defined it "reasonable personification". However, when no adult defined a given object in human-like terms, they talked about "unreasonable" and hence not an adultlike personification (Inagaki – Hatano 1987: 1015). The reasonableness of personification seems to draw a clear line between the materials for parents and for children. It would be quite bizarre if texts containing advice to parents alluded to feelings of the coronavirus, even inside a simulated explanation. Yet, the interesting question – one left for further ethnographic research – concerns whether such personified portrayals of the virus are advantageous or misleading for young children.

There are also convergent tendencies across the corpora. First, similarly to the Advice-to-Parents corpus, the immune system is personified (37) as a team of superheroes with superpowers who fight the invaders.

(37)   […] a special super power we're all born with: our immune system. *A real team of superheroes* made up of cells with *extraordinary abilities*, able *to recognize outside invaders and defend us from them*, while memorizing the strategy they use to do so. (A curious guide for courageous kids – the vaccine)

Second, metaphors of defence and training are frequently introduced to explain the vaccine, extending the personified vision of our immune system.

(38)   The immune system takes several days to build specific antibodies, and this could be dangerous if the virus is really *aggressive*. In this case, our immune system needs *special training*, just *like when we learn a new exercise or to read and write*! Today we know that we can *train our immune system* through vaccines that produce antibodies and *defeat viruses*, without making us sick. (A curious guide for courageous kids – the vaccine)

It appears thus that personification of an inanimate, unseen and generally intangible object, such as a virus, a cell or an antibody, is the predominant popularizing strategy in materials for children, at times even amplified in translation. However, while in these publications every inanimate object is personified, in the Advice-to-Parents texts only selective personification is carried out, with respect to the "good players", i.e., the antibodies, cells and the immune system in general.

5. Discussion and concluding remarks

This research has identified two noteworthy aspects concerning popularization of the Covid-19 pandemic to children. The first concerns definitions that most frequently are of a mixed type, combining elements of intensional and implicative definitions to address potential knowledge gaps concerning the genus "virus" and, perhaps, children's limited vocabulary. The definitions included specific reference to children's pre-existing knowledge realized through similes. A significant number of definitions introduced misconceptions equalling the virus with the illness and potentially adding to children's disorientation. No such misconceptions were retrieved from texts whose (co-)authors or consultants had healthcare-related expertise. It would be naïve to expect free online publications for children to be always scientifically sound, yet this research shows that popularization to children in free online materials – available to any parent with access to the Internet and looking for pre-packed answers – should be further problematized.

The second aspect concerns the theoretical apparatus of popularization for children. In their milestone work on popularization to adults, Calsamiglia and van Dijk (2004: 382) noticed a few instances of "the personification of the micro life of genes in terms of the macro world of human society". Yet – to the best of my knowledge – personification of inanimate objects was never

separated as a self-standing category in the literature on popularization in general and popularization to children in particular, even though Cesiri (2019) talked about the anthropomorphized representation of animated beings – dinosaurs. Whereas analogies and associations in 'adult' popularization may be quite varied as adults gain broad knowledge in different domains over the course of their lives, this research indicates that popularization for children relies almost exclusively on one type of analogy: the person analogy, or personification. Personification is used either in a 'reasonable' adultlike way in texts providing advice to parents, or in an 'unreasonable' childlike way in publications for children. On account of the intrinsically animistic and personifying nature of young children, it seems appropriate to add personification as a separate category to the framework of popularizing strategies for children. This proposal would benefit from further research including interviews with children aimed at assessing how they organize and linguistically realize knowledge about viruses.

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APPENDIX 1

Advice-to-Parents corpus, all links last accessed on 1 August 2021

Title	Author/Publisher/Website	language	tokens
Coronavirus (COVID-19): How to Talk to Your Child	KidsHealth.org https://kidshealth.org/en/parents/coronavirus-how-talk-child.html	ENG	747
How to talk to your kids about COVID-19	MayoClinic https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/kids-covid-19/art-20482508	ENG	649
How to Talk to Your Kids About Coronavirus	Debora Farmer Kris/PBS https://www.pbs.org/parents/thrive/how-to-talk-to-your-kids-about-coronavirus	ENG	1,004
Talking with children about Coronavirus Disease 2019: Messages for parents, school staff, and others working with children	CDC https://scdmh.net/wp-content/uploads/ 2020/03/Talkingwithchildren-aboutCoronavirus.pdf	ENG	911
How to talk to your children about COVID-19 vaccines	UNICEF https://www.unicef.org/coronavirus/how-to-talk-to-children-covid-vaccines	ENG	768
Parlare di Coronavirus con i bambini [Talking about Coronavirus with children]	Silvana Quadrino, psicologa e psicoterapeuta, Sergio Conti Nibali, pediatra e direttore di UPPA magazine https://www.uppa.it/parlare-di-coronavirus-con-i-bambini/	ITA	858
Come spiegare ai bambini cosa sono i vaccini e come funzionano [How to explain to children what vaccines are and how they work]	Nicholas St. Fleur, National Geographic https://www.nationalgeographic.it/scienza/2020/12/parlare-ai-bambini-dei-vaccini	ITA	1,089

Il Coronavirus spiegato a bambini e adolescenti [Coronavirus explained to children and teenagers]	Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, https://www.policlinico.mi.it/coronavirus-spiegato-a-bambini-e-adolescenti	ITA	879
Kak govorit' s rebenkom o COVID-19 [How to talk to a child about COVID-19]	Randall Children's Hospital, https://www.legacyhealth.org/-/media/Files/PDF/Health-Professionals/Pedinet/RCH-Talking-with-Your-Kids-about-COVID_RU.pdf	RUS	300
Kak rasskazat' rebenku o koronaviruse i COVID-19 [How to tell a child about coronavirus and COVID-19]	St. Jude's Children's Research Hospital https://together.stjude.org/ru-ru/lechenie-podderzhka/razgovor-o-koronaviruse-covid-19.html	RUS	992
Kak govorit' s malen'kim rebenkom o koronaviruse [How to talk to a small child about coronavirus]	Universitet detstva https://prosv.ru/pages/kak-govorit-s-malenkim-rebyonkom-o-koronaviruse.html	RUS	564

APPENDIX 2

Materials-for-Children corpus, all materials last accessed on 1 August 2021

Title	Author/Publisher/Website	language	tokens
Children's guide to coronavirus	UK Children's Commissioner	ENG	1,526
Clear Answers for All Kids	Arlen Grad Gaines and Meredith Englander Polsky (downloaded from https://www.childrenandyouthgriefnetwork.com/)	ENG	1,781

Coronavirus and Covid: A Book for children about the pandemic	Elizabeth Jenner, Kate Wilson & Nia Roberts Consultant: Professor Graham Medley. Professor of Infectious Disease Modelling, London School of Hygiene & Tropical Medicine (https://nosycrow.com/)	ENG	3,009
		ITA (transl)*	2,257
		RUS (transl)*	2,499
Covibook	Manuela Molina https://www.mindheart.co/	ENG	300
		ITA (transl)	261
		RUS (transl)	286
Covid-19 Children's Book	NSW Government (https://www.schn.health.nsw.gov.au/ files/attachments/covid-19-childrens-book.pdf)	ENG	271
What you can do about Covid-19. Coloring book with rhyming story	Scott Emmons (https://www.scottemmonscreative.com/ work/tex-mex-t-rex-yp2c9-bc22g-cxdtj-7t733)	ENG	449
A Message from Corona	Charity Tedder (endorsed by Professor Richard Tedder, Visiting Professor of Medical Virology, Imperial College London) (https://www.gofundme.com/f/ a-message-from-corona)	ENG	590
My Hero is You, Storybook for Children on COVID-19	Inter-Agency Standing Committee (UNICEF) (https://interagencystandingcommittee. org/iasc-reference-group-mental-health-and-psychosocial-support-emergency-settings/my-hero-you-storybook-children-covid-19)	ENG	2,739
		ITA (transl)	2,802
		RUS (transl)	2,442
Rock Monsters	www.rockmonsterfriends.com	ENG	588
The Big Thing	by Angela Meng and Alexander Friedman, Asymmetry LLC (https://jheconomics.com/wp-content/ uploads/2020/05/The-Big-Thing-ENGLISH.pdf)	ENG	1,102
		ITA (transl)	1,105

Fighting the Virus: Trinka's and Sam's Questions	by Chandra Michiko Ghosh Ippen and Melissa Brymer, Piploproductions, University of California (https://www.nctsn.org/resources/ fighting-the-big-virus-trinka-and-sam-questions)	ENG	1,569
What is Covid-19?	Alexis Roumanis graduated from Simon Fraser University's Master in Publishing program in 2009, Canada (https://www.sd72.bc.ca/departments/ librarylearningcommons_ 2/Documents/What%20Is%20 COVID-19%20-%20Level%201%20-%20 Free%20eBook.pdf)	ENG	1,177
Guida Galattica al corona virus/A curious guide for courageous kids	Rete nazionale musei dei bambini Dr.ssa Daniela Longo, PhD in medicina clinica e sperimentale; Dr.ssa Erika Nerini, PhD in scienze e tecnologie dei prodotti della salute	ITA	513
	(https://www.muba.it/files/ uploads/2020/03/10/guida-galattica-al-corona-virus-a-curious-guide-for-courageous-kids.pdf)	ENG (transl)	499
Guida Galattica al vaccino per bambini e bambine curiosi/A curious guide for courageous kids – the vaccine	Rete nazionale musei dei bambini Dr.ssa Daniela Longo, PhD in medicina clinica e sperimentale; Dr.ssa Erika Nerini, PhD in scienze e tecnologie dei prodotti della salute	ITA	938
	(https://www.mdbr.it/guida-galattica-al-corona-virus/)	ENG (transl)	882
I consigli di Mio, Mia e Meo: Coronavirus	Federazione Italiana Medici Pediatri http://www.miomiaemeo.it/ coronavirus/	ITA	304
Storia di un coronavirus: Maestra, come si fa?	Francesca Dall'Ara, dell'Unità di Neuropsichiatria dell'Infanzia e dell'Adolescenza (UONPIA) della Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico di Milano (https://www.policlinico. mi.it/coronavirus-spiegato-a-bambini-e-adolescenti)	ITA	3,663

| Storia di un coronavirus | Francesca Dall'Ara, dell'Unità di Neuropsichiatria dell'Infanzia e dell'Adolescenza (UONPIA) della Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico di Milano (https://www.policlinico.mi.it/coronavirus-spiegato-a-bambini-e-adolescenti9 | ITA | 1,417 |

* Translations are based on the 2020 edition of the book.

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