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EMPIRICAL STUDY / ANALYSIS

Life-World, World of Science, and Vaccine Hesitancy: A Phenomenological Approach

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Abstract
This article aimed to show the analytical potential of the life-world concept in the field of public health, which has not received much attention in the phenomenological literature. Specifically, based on phenomenologically grounded qualitative research, we aimed to show how the life-world concept, as worked out in Edmund Husserl's philosophy, can offer new insights on COVID-19 vaccine hesitancy. Although there are many ways in which the life-world can motivate vaccine hesitancy, we have narrowed our focus to one of them. Our aim is to argue that COVID-19 vaccine hesitancy is motivated by discrepancies and conflicts between the perceptual life-world and the scientific knowledge. If the scientific knowledge about the pandemic and the vaccine is not integrated in the life-world—which in its core is an embodied, perceptual world—and instead conflicts with it, people are more likely to become disinclined to get vaccinated rather than motivated to pursue vaccination. We conclude the discussion by outlining ideas on how the insights offered by our analysis could be potentially used in devising management and communication strategies in public health crises, such as a pandemic outbreak.

Keywords Phenomenology · Life-world · Epistemic superiority · Vaccine hesitancy · COVID-19 · Qualitative research

Introduction

In the phenomenological movement, a long-standing and flourishing tradition is dedicated to exploring health and medicine-related issues in which phenomenological concepts have been applied to offer insights on experiential aspects, such as embodiment, space, time, selfhood, and intersubjectivity, in illness and disability (Carel,

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2016; Fuchs, 2010; Leder, 1990; Slatman, 2014; Svenaeus, 2011; Toombs, 1992), use of technologies in health-care (Grīnfelde, 2022; Osler, 2020; Svenaeus, 2018, 2023), and relationship between patients and healthcare professionals (Carel & Macnaughton, 2012; Dolezal, 2015; Pellegrino, 2004; Toombs, 2019). The concept of the life-world has been employed in this context, though it has been mostly limited to illness and disability experience (Mancini et al., 2014; Messas et al., 2018; chapters from Stanghellini et al., 2019; Toombs, 1995), and patient-healthcare-professional relationship (Carel, 2011; Pellegrino, 2004; Toombs, 1992; Zhang, 2024). This article aimed to show the analytical potential of the life-world concept in the field of public health, which is a far less phenomenologically explored avenue.[1] Public health is a multidisciplinary field aimed at preventing diseases and promoting health in the population, whose importance became blatantly visible during the SARS-CoV-2 (COVID-19) pandemic. While phenomenologists have focused on different experiential aspects of the pandemic, including different preventative measures to curb it (Aho, 2020; Carel, 2020; Carel et al., 2020; Dolezal, 2020; Rodrigues et al., 2023; van Grunsven, 2020; Vēgners, 2022), we aimed to use the life-world concept in the analysis of one specific type of preventative measures, namely immunization. More specifically, we will explore how the life-world concept can offer insights to better understand vaccine hesitancy in the COVID-19 pandemic context.

The World Health Organization (WHO) defines vaccine hesitancy as a "delay in acceptance or refusal of vaccines despite availability of vaccination services" (MacDonald & the SAGE Working Group on Vaccine Hesitancy, 2015: 4163) and lists it among the top ten threats to global health (WHO, 2019). Despite not being a new phenomenon (Dubé & MacDonald, 2018; Nuwarda et al., 2022), vaccine hesitancy has drawn increased attention during the COVID-19 pandemic. In reaction to the COVID-19 pandemic, many studies have identified demographic characteristics, social determinants, and psychological factors of COVID-19 vaccine hesitancy. Vaccine hesitancy is "complex and context specific, varying across time, place and vaccines" (MacDonald & the SAGE Working Group on Vaccine Hesitancy, 2015: 4163) and many factors have been identified to explain COVID-19 vaccine hesitancy, like "being against vaccines in general, concerns about safety/thinking that a vaccine produced in a rush is too dangerous, considering the vaccine useless because of the harmless nature of COVID-19, general lack of trust, doubts about the efficiency of the vaccine, belief to be already immunized, doubt about the provenience of vaccine" (Troiano & Nardi, 2021). We aimed to explain COVID-19 vaccine hesitancy using the phenomenological life-world concept as worked out in the philosophy of Edmund Husserl, which will provide a new perspective on vaccine hesitancy.

The life-world (*Lebenswelt*) is a central topic in Husserl's phenomenology, which has become influential in phenomenological philosophy and beyond (Lee, 2020: 48; Moran, 2012: 215ff.). However, despite extensive and rich descriptions of the life-world, in Husserl's works this multi-faceted concept does not reach a full elaboration and retains a tentative and exploratory character (Moran, 2012: 178–180). Commentators have discussed the exact meaning of the concept—especially whether it has one

[1] We are aware of Tarun Kattumana and Thomas Byrne's work (2023) which uses Husserl's distinction between the world of science and the life-world to address the issue of public-health interventions.

or several meanings (Lee, 2020). While recognising the explorative and pluralistic nature of Husserl's life-world concept, inspired by Carr (2005) and Dermot Moran's (2012) interpretative approach to the life-world, we will present the life-world as a perceptual, embodied, always pregiven, self-evident and taken-for-granted world of our everyday life which serves as the ultimate ground that supports our cognitions and motivates our decisions and actions. Following Carr, we will also differentiate three layers or levels of the life-world: the perceptual, the cultural, and the scientific life-world.

Although there are many ways in which the life-world can motivate vaccine hesitancy, we have narrowed our focus to the relationship between the perceptual life-world (as the core, foundational layer of the life-world) and the scientific knowledge surrounding the pandemic and the vaccine, and how this relationship leads to vaccine hesitancy. The life-world motivates us to decide and act in a certain way because it is a self-evident and taken-for-granted world and serves as the ultimate, unsurpassable realm of reality and a source of verification. In this context, our aim is to argue that COVID-19 vaccine hesitancy is motivated by discrepancies and conflicts between the perceptual life-world and the scientific knowledge. If the scientific knowledge about the pandemic and the vaccine is not integrated into the life-world—which at its core is an embodied, perceptual world—and instead conflicts with it, people are more likely to become disinclined to get vaccinated rather than motivated to pursue vaccination. We believe that these insights from our analysis could be potentially used in devising management and communication strategies in public health crises, such as the pandemic outbreak.

Methodology

To gain insights into how the life-world plays into COVID-19 vaccine hesitancy in Latvia we conducted a phenomenologically grounded qualitative empirical research study, based on the "Phenomenologically Grounded Qualitative Research" (PGQR) approach (Køster & Fernandez, 2023) and the methodological framework called 'Phenomenological interview' (PI) (Høffding & Martiny, 2016). Both advocate for integrating qualitative research with phenomenological philosophy.

For the study, we conducted 16 in-depth semi-structured interviews with individuals who fell within the category of the COVID-19 vaccine-hesitant individuals at the time of the interview, though some of them had already been vaccinated against COVID-19. The interviews were conducted from April to October 2022, both in-person (10 interviews) and online (6 interviews). The study has received approval from the University of Latvia Human and Social Sciences Research Ethics Committee. Informed consent was obtained from the participants before interviews, and the data used in this article has been anonymised.

We recruited participants using snowball sampling and through community gatekeepers. We used purposive maximum variation sampling. In total 16 adult research participants—aged 25 to 85 years (median age 44)—from Latvia with a demographically diverse background were enrolled in the study; half of them were women and half were men.

We employed the PGQR approach, utilizing core phenomenological concepts to design the interview guide, conduct interviews, and analyse data with the primary aim of identifying motivational factors behind COVID-19 vaccine hesitancy. While we used the concept of embodiment to develop our interview guide (asking, for example, how the pandemic altered participants' habitual bodily engagement with the world and how their body image changed through interactions in specific social contexts), drawing from our participants' descriptions of their immediate experiences as contrasted with scientific knowledge, we introduced the concept of life-world to ground the interviewing and the data analysis.

The interview process was largely inspired by the framework developed by Høffding and Martiny (2016: 558), who maintain that "in the interview process one should be aware of one's phenomenological commitments, take up an empathetic, reciprocal and second-person perspective when encountering the subject, and ask specific open questions in order to get descriptions that are as detailed as possible". According to these authors, "the interview is informed by certain phenomenological commitments and in turn informs a phenomenological investigation" (2016: 540). The phenomenological commitments guiding our interviews were: firstly, a focus on the lived experience of the research participant; secondly, the aim of disclosing the invariant motivational structure of this experience; thirdly, focus on the first-person perspective on its own terms, without reducing it to objectivity; and fourthly, the assumption that experience is constituted, at least in part, by one's body and social context (Høffding & Martiny, 2016: 542ff.–544). Regarding the pragmatics of the interviewing, phenomenological interviews share many similarities with in-depth open-ended interviews (use of open-ended "how" questions). However, they are phenomenologically grounded which requires the phenomenological sensitivity of the interviewer (Køster & Fernandez, 2023: 160). The phenomenological background of the interviewer enables her to recognize when modifications are needed in the interview guide to get relevant data and to introduce phenomenologically informed follow-up questions during the interview, based on the participants' descriptions of their experiences. Consequently, there is an ongoing implicit phenomenological analysis throughout the interview process trying to determine which answers could be used for developing phenomenological themes, what kinds of phenomenological structures (concepts) they involve, if they contradict one another, etc. (Høffding & Martiny, 2016: 556). Overall, when conducting an interview, we—as interviewers—did not enter the interview as neutral. We employed a conceptual lens that helped us co-generate the interviewees' descriptions. However, this lens was itself open to modification based on the interviewees' descriptions.

Regarding data analysis, we first employed inductive thematic analysis (Braun and Clarke, 2006), involving the coding of the transcribed data and identification of themes and sub-themes. To facilitate this process we used the NVivo 12 plus program. This initial step was crucial to remain open to changes in the selection of the pre-defined phenomenological concepts. The next step of the analysis consisted of re-reading and re-coding the data, considering the relevant phenomenological concepts and discussions from the phenomenological literature. This analysis led to the re-grouping of codes and sub-themes into phenomenologically centered codes and themes that expressed the motivational possibilities of COVID-19 vaccine hesi-

tancy. While we utilized various phenomenological concepts to analyse vaccine hesitancy—the lived body and the object body, body memory, bodily certainty, etc.—in this article, we focus on the phenomenological themes identified through the lens of the life-world concept.

Life-World

In Husserl's philosophy, the life-world designates the subjective world of experience in which we spend our conscious lives (Husserl, 1970: 54, 104, 343, 379). It is the world which is always already and permanently pregiven to us (Husserl, 1970: 142, 186f.) and which we always take for granted (Husserl, 1970: 122, 123). It is a world of which we are certain and the existence of which we do not doubt (Husserl, 1970: 172, 186f.). We unreflectively accept it as it is. Husserl also describes it as the only real (Husserl, 1970: 49, 216), obviously existing world (Husserl, 1970: 112, 180). It is the familiar world which we know best (Husserl, 1970: 123) and which holds what is self-evident and valid for us (Husserl, 1970: 68, 122, 127–130). Moreover, the life-world is the world of habitualities (Husserl, 1970: 105), traditions, and sedimentations (Husserl, 1970: 52). It is the everyday world of normal practical life (Husserl, 1970: 104, 172, 343f.), both extratheoretical and theoretical (Husserl, 1970: 142).

Beyond these general descriptions, it is possible to discern several related meanings of the life-world. Following Carr (1974: 194–211; 2004; 2005; see also Lee, 2020: 50, 52ff.; Moran, 2012), it is possible to distinguish between narrower and wider senses of the life-world. These senses represent levels or layers of the life-world that stand in a founding relationship. The narrower concept of the life-world, which Husserl describes as the core, most fundamental layer of the life-world (Husserl, 2002: 18) upon which the other layers are built is the perceived world (Husserl, 1970: 48f.). A wider concept of the life-world consists of the perceptual world and the cultural world. Lastly, the widest concept, which Husserl describes as the life-world in its complete and full concreteness (Husserl, 1970: 131), comprises the perceptual world, the cultural world and the scientific world. The perceptual world founds or, in other words, is presupposed by the cultural world, which in turn founds or is presupposed by the scientific world.

The perceptual life-world is the world of our embodied perception and agency. It is the world of concrete and individual things that are given in perception as self-evident and actually existing (Husserl, 1970: 127f.). To the life-world as the perceptual world "belongs the form of space-time together with all the bodily [*körperlich*] shapes incorporated in it; it is in this world that we ourselves live, in accord with our bodily [*leiblich*], personal way of being. But here we find nothing of geometrical idealities, no geometrical space or mathematical time with all their shapes" (Husserl, 1970: 50; see also Husserl, 1970: 139f.). As we are embodied, our needs, wishes, interests, concerns, fears, doubts, strivings, goals, projects, abilities, and habitualities inevitably shape our existence in the life-world (Moran, 2012: 199). The life-world is a world "in which we live, think, act, create"[2] (Husserl, 2002:: 18) as persons

[2] Authors' translation. In German: "in der wir leben, denken, wirken, schaffen".

with all our concerns and momentary and enduring goals and efforts to achieve them (Husserl, 1970: 157, 379). And the things in this world—instead of being just natural objects—are rather value-objects, practical use-objects (Moran, 2012: 212).

The evaluative and practical significance is interconnected with the life-world as the cultural world, which is built upon the perceptual life-world. In the perceptual life-world we are not alone; rather, we perceive others with whom we share our embodied perceptual and practical world: "Among the objects of the life-world we also find human beings, with all their human action and concern, works and suffering, living in common in the world-horizon in their particular social interrelations and knowing themselves to be such. (Husserl, 1970: 146)" The life-world is intersubjectively shared and social (Husserl, 1970: 122, 343f.; Carr, 2005: 9; Moran, 2012: 198f.) not only because we as persons find ourselves among other persons in the world, but also, and importantly, because we share our understanding of that world—what exists and how it exists—by communicating with each other (Ferencz-Flatz, 2019: 5ff.). Living together we create and develop common cultural meanings, forms and products (Husserl, 1970: 277). The life-world is a cultural, traditional, and historical world (Carr, 2005: 10, 16; Moran, 2012: 182, 184f.) which differs from one cultural group or historical epoch to another. The cultural life-world is the perceptual life-world that is enveloped in cultural meaning. The evaluative and practical significance of things within our life-world is embedded in the culture in which we live.

The relationship between the life-world as the pre- and extrascientific perceptual and cultural life-world and the world of science is complex. Husserl describes this relationship as that of contrast and inseparable union (Husserl, 1970: 131). Let us begin by contrasting the life-world with the world of science. According to Husserl, modern science since Galileo Galilei has been characterised by mathematisation, an intellectual process which turns nature into a mathematical manifold (Berghofer et al., 2021: 414; Husserl, 1970: 23). Due to this process, nature is taken as essentially geometrical with mathematical expressibility serving as a criterion for what counts as objectively real (Berghofer et al., 2021: 415).

The world of science is not the life-world that we see, hear, or feel with other senses. It is not the pre- and extrascientific life-world characterized by its concrete, individual, and immediate perceptual objects and the events they are involved in. Instead, as a set of theoretical constructs and interpretations intended to objectively understand the life-world once and for all, it is an intelligible world that we can only think about and understand. As Husserl writes, the world of science is "a theoretical-logical substruction, the substruction of something that is in principle not perceivable, in principle not experienceable in its own proper being" (Husserl, 1970: 127). The scientific accomplishment is not one of "seeing," but of specialized ways of thinking and conceiving the world (Carr, 2005: 5). To use Husserl's own metaphorical language, geometrical and natural-scientific mathematization dresses the perceptual life-world in a "garb of ideas" or "garb of symbols of the symbolic mathematical theories" (Husserl, 1970: 51). These, in the form of objectively scientific truths, function for us as what is objectively actual and true, allowing us to make predictions far more accurately than those of the prescientific life-world (Husserl, 1970: 51).

In what sense, then, the scientific world—which builds upon and entails the perceptual and the cultural life-world (Husserl, 1970: 59)—is the last layer of the

life-world and constitutes the life-world in its complete and full concreteness? The general answer is that science belongs to the life-world as an accomplishment of scientists who are persons living and working together in a community of scientific activity that occurs within the perceptual and cultural life-world. Although scientific theories and logical constructs are not individual things like stones or trees, they are human formations and belong to the human actualities and potentialities of the life-world (Husserl, 1970: 130, 133). Sciences, scientists and scientific theories form a special class of cultural facts, cultural accomplishments, or acquisitions, as cultural and practical structures belong to the cultural life-world (Husserl, 1970: 104, 173, 276). Scientific practice belongs to the life-world in its complete and full concreteness (Husserl, 1970: 131). Science is one among many practical hypotheses, projects, interests, and vocations that constitute the life in the life-world (Husserl, 1970: 135f., 138).

Moreover, the world of science not only has validity for scientists, but also generally has "come to be taken completely for granted" (Husserl, 1970: 344) and become sedimented or traditionalized, thus belonging to the life-world (Husserl, 1970: 52; Moran, 2012: 185). As Husserl writes, science "is a validity for the life-world, arising out of particular activities, and that it belongs itself to the concreteness of the life-world" (Husserl, 1970: 133; see also Husserl, 1970: 133). This means that scientific accomplishments not only presuppose and are grounded within the life-world, but also enrich and and form an integral part of it (Husserl, 1970: 131, 140; Carr, 2005: 16). For Husserl the "concrete life-world, then, is the grounding soil [*der gründende Boden*] of the "scientifically true" world and at the same time encompasses it in its own universal concreteness" (Husserl, 1970: 131). This is the sense in which we can speak about the life-world as the scientific world.

According to Husserl, no matter how far apart and removed the ideal world of science and the pre- and extrascientific life-world might seem, the former is rooted or grounded in the latter. First, science is grounded in the pre- and extrascientific life-world because this life-world is always and constantly pregiven to scientists and scientific community. Scientists and scientific practices always occur in and are components of the pre- and extrascientific life-world (Husserl, 1970: 130f.).

Second, science is rooted in the pre- and extrascientific life-world because the purpose of the former lies in the latter (Husserl, 1970: 50). The purpose of science is to understand the pregiven world and to change it through scientifically informed praxis. The prescientific knowledge and goals of the life-world play a constant role in scientific questions (Husserl, 1970: 121), and when "science poses and answers questions, these are from the start, and hence from then on, questions resting upon the ground of, and addressed to, the elements of this pregiven world in which science and every other life-praxis is engaged" (Husserl, 1970: 121).

Third, science is rooted in the pre- and extrascientific life-world because the mathematical idealities of the scientific world have emerged from and still presuppose the perceptual, directly intuited realities of the life-world as their meaning-fundament (Husserl, 1970: 49ff., 121, 123, 128, 140, 347). After all, scientific theory is an interpretation of the always pregiven prescientific life-world (Carr, 2005: 16). There is a constant reference of meaning to the perceptual life-world in which we live (Husserl, 1970: 130). This is evident when we use perceptual objects, drawings, and schemas as

perceptual intermediaries to help us conceive and understand theroetical conceptions (Husserl, 1970: 26). A simple example of this is when we apperceive "geometrical straight lines on the basis of the life-world self-evidence of straight table-edges and the like" (Husserl, 1970: 129). But scientific theories and "models" can become so complex and advanced that often many intermediaries are involved (Husserl, 1970: 129). Another way the scientific idealities presuppose perceptual realities is through technologies scientists use in their work. These technologies, instead of being ideal objects, are real, perceptual objects. The physicist "sees his measuring instruments, hears timebeats, estimates visible magnitudes, etc." (Husserl, 1970: 121).

Fourth, science is rooted in the pre- and extrascientific life-world because the latter is functioning for scientists "not as something irrelevant that must be passed through but as that which ultimately grounds the theoretical-logical ontic validity for all objective verification, i.e., as the source of self-evidence, the source of verification" (Husserl, 1970: 126; see also: 125, 127f.). On the one hand, the subjective-relative pre- and extrascientific life-world is flawed and lacking. As Husserl recognises, it gives us incomplete and approximate knowledge (Husserl, 1970: 123f.). It never gives us perfect, exact knowledge, leaving us with a horizon of "open unfamiliarity" (Husserl, 1970: 343). As such, the truths that the pre- and extrascientific life-world has to offer have little value in the eyes of a scientist (Husserl, 1970: 54). On the other hand, despite the disdain scientists may have for the merely subjective and relative of the pre- and extrascientific life-world, and despite their goal to overcome it with objective-logical truth, the validity of the pre- and extrascientific life-world is a premise for all scientific validity (Husserl, 1970: 126). By relying on the self-evidence of the perceptual life-world as the source of their own self-evidence (Husserl, 1970: 129), scientific truths are only valid by leading back and in reference to their applicability to the perceptual life-world (Husserl, 1970: 127f., 347). Only through perceptually based self-evidences can scientific idealities claim to represent what actually exists. Thus, for Husserl, the pre- and extrascientific life-world is a realm of original and primal self-evidences (Husserl, 1970: 127, 128), which have "higher dignity in the grounding of knowledge compared to that of the objective-logical self-evidences" (Husserl, 1970: 128). Perceptual verification "yields a full conviction" (Husserl, 1970: 127).

No matter which level or layer of the life-world we are discussing, the life-world is the world of what we take for granted, what we are certain of, what is self-evident and obvious to us, and what is habitual and familiar. The life-world is the world which we prereflectively[3] take at face value, rely upon, and simply live. It is the world in which we live by not thinking or reflecting about it. It is not the object of our doubt and questioning, our inspection and scrutiny. And if there is something in our experience that invokes reflection, doubt, uncertainty, questioning, or scrutiny, it is not part of our life-world. For example, nonsensical, incomprehensible, uncanny, unfamiliar, unexpected, surprising, new, obtrusive, problematic, broken, nonfunctional, out-of-

[3] Prereflective experiences here include not only experiences that have never been reflected upon, but also once reflected experiences and achievements of our thought that have been sedimented and are unreflectively carried out in our life. Once I learn something about the world, I just unreflectively use my knowledge.

ordinary, irregular and random things and events do not belong to our life-world because they provoke reflection. Instead of simply living them, they become objects of our reflection and thought. An unfamiliar, confusing, or unexpected sensation that provokes reflection is not a part of our life-world. Unfamiliar cultures or incomprehensible scientific concepts and theories also do not belong to the life-world. However, the life-world is not static; it is dynamic. Objects that are initially outside the life-world can enter it by becoming habitual and familiar, or by being understood. Conversely, objects can lose their place in the life-world by becoming problematic and requiring our thought and reflection.

Good examples are provided by the phenomenology of medicine. S. Kay Toombs, writing about the experience of illness and disability, claims that these conditions bring radical changes in one's relationship with the world. Although she does not use the term "life-world," what she describes captures the radical proces in which much of the life-world is emptied, as many things lose their taken-for-granted and habitual character. She speaks of a world which is disintegrated, "lost, broken, or reduced to chaos" (Toombs, 1988: 207) in the face of illness and disability. Objects assume different meanings and become problems to be solved. For example, she describes how the meaning of stairs changes as her ability to climb them diminishes due to a degenerative condition (Toombs, 1995: 13, 15f.). She writes that one's being-in-the-world becomes explicit and effortful because "objects that were formerly used unthinkingly are now encountered as overt problems to the body" (Toombs, 1995: 13). The world changes so drastically that it loses its taken-for-grantedness and requires re-interpretation, relearning, remaking, and reorganization (Toombs, 1995: 13, 16; Toombs, 1988: 207). Similarly, Fredrik Svenaeus describes illness in terms of unhomelike being-in-the-world, where the world loses its meaning and is experienced as alien (Svenaeus, 2011).

Another example of a radical emptying or narrowing of the life-world, where things loose their taken-for-granted character and thus no longer belong to the life-world, is the COVID-19 pandemic. The drastic changes brought about by the pandemic have been examined from a phenomenological perspective (see, for example, Aho, 2020; Carel, 2020; Carel et al., 2020; Dolezal, 2020; Rodrigues et al., 2023; van Grunsven, 2020; Vēgners, 2022, Zeiler et al., 2024). The pandemic world has been conceptualized as a new, strange, and uncanny world (Aho, 2020; Gara, 2021; van Grunsven, 2020), characterised by prohibition, loss, fear, instability, uncertainty, distrust, scepticism, and hypervigilance (Rodrigues et al., 2023). The onset of the pandemic marked a disruption, breakdown, and loss of the taken-for-granted, familiar world (Carel, 2020; van Grunsven, 2020). In this context, Havi Carel introduced the term "global uncertainty" to describe "the loss of trust and sense of certainty about almost everything in our lives" (Carel, 2020: 16).[4] It is an experience of "suspicion, uncertainty and doubt" (Carel, 2020: 16). Similarly to Toombs and Svenaeus, Carel does not use the term "life-world," but the world that was disrupted and lost during

[4] Carel's concept of bodily doubt (Carel, 2013, 2016, 2020; and also Rodrigues et al., 2023) and Tom Roberts and Lucy Osler's concept of social doubt (2024) also reveal important aspects of the pandemic experience.

the pandemic was the life-world—the self-evident, certain, taken-for-granted, and familiar world.

Life-World and Vaccine Hesitancy

Now that we have outlined the life-world concept, we will show based on our interview material how the life-world motivates vaccine hesitancy. Although there are many ways the life-world can motivate vaccine hesitancy, including through cultural and political beliefs, we identified a motivational pattern shared by many of our participants that centers on the relationship between the life-world and the world of science. We will show that rather than being a part of the life-world for our research participants, the science behind the COVID-19 pandemic and vaccines is removed from and in conflict with it. The embodied, perceptually based life-world of many of our respondents contradicts the scientifically based statements. This means they hesitate to vaccinate because the science that supports vaccination is not verified in their life-world. Their perception-based life-world motivates them not to vaccinate, despite science-based recommendations to do so.

World of Science and the Life-World

As stated earlier, science forms the third layer of the life-world and is rooted in the pre- and extrascientific life-world (and ultimately in the perceptual life-world as the first layer of the life-world) (Husserl, 1970: 52, 344). However, this does not mean that all scientific accomplishments, concepts, and theories necessarily become a part of the scientific life-world. We can easily imagine historical cultures that knew nothing of scientific achievements; and even today, while science in general may be taken for granted, not every specific piece of scientific knowledge is such.

On the one hand, in our everyday lives, we unreflectively use scientific knowledge and the technologies made possible by it. We are accustomed to "seeing" the world through the lens of scientific knowledge, which we have acquired both through formal education and informal learning. In this way, science becomes a part of our life-world.

On the other hand, science has become so increasingly advanced that the world of science has become removed and incomporehensible to most of us (Carr, 2005: 5). This applies not only to laypersons but also to scientists themselves. Even those working in the same field do not always and fully comprehend all intricacies of specific concepts and theories outside their specialization. As Carr notices, a discrepancy is inevitable between the scientific concept of reality and the prescientific sense of reality (Carr, 2005: 6), due to the fact that what is scientifically real has retreated farther and farther from our actual experience of the world (Carr, 2005: 12). Because of this, many theoretical achievements of science, despite having their roots in the prescientific life-world, can be experienced as removed or uprooted from it by many (Carr, 2005: 5). As a result, these achievements do not constitute a part of their life-world. Also, understanding a theory is not sufficient for it to become a part of the life-world, because even if one comprehends a scientific concept or theory, it does not

necessarily mean that one can or do relate it back to the perceptual life-world. Only those scientific achievements that are understood and meaningfully integrated into one's embodied and perceptual life-world can be considered a part of one's scientific life-world. As Carr notes, there is a distinction between subscribing to a theory and living in a world where the theory is among its constituents (Carr, 2005: 10; 2004: 366). Only if the latter is true—meaning, if I use the theory as a lens to understand my experiences, make my decisions, and ground my actions in my life—can we say that the theory is a part of my life-world. Only scientific knowledge that is a part of the life-world by being understood and apperceptively linked to the perceptual life-world will determine our decisions in life (Husserl, 1970: 125). For Husserl scientific truths are truths only in reference to their applicability to the perceptual life-world (Husserl, 1970: 347), which plays an unsurpassable (Husserl, 1970: 50) and prominent role in all verifications (Husserl, 1970: 106; Høffding et al., 2022: 42; Ruggerone, 2013: 182). As Moran (2012: 200) asserts: "For Husserl the life-world has overall primacy and fundamentality with regard to 'being' (*Sein*), 'sense' (*Sinn*) and 'validity' (*Geltung*)". If scientific knowledge does not connect to the perceptual life-world, it is not taken as real (Husserl, 1970: 48f.), and, consequently, is not operationalized to make real-life decisions, including the decision of whether to get vaccinated or not.

To sum it up: first, a piece of scientific knowledge is a part of the scientific life-world only if it is related to and leads back to the perceptual life-world, which is the core, foundational layer of the life-world. If I cannot apperceptively experience this knowledge in my perceptual life-world, it is not a part of the scientific life-world. Instead, it is a part of the world of science, but not of the scientific life-world as the top layer of the life-world. Second, the life-world is the world we take as the actual, real world in which we live and act. As the real, actual world, it motivates us to act. All the decisions we make and all the actions we take are responses to our situation in the life-world. Therefore, if scientific knowledge is integrated into our life-world, it will motivate us to act (or not to act) in a certain way. If it is not, it will not motivate. Moreover, if scientific knowledge conflicts with and contradicts our taken-for-granted and self-evident life-world, our decisions will be guided by the life-world rather than by scientific knowledge that is not part of it.

Taking this all into account, we will show that, rather than being a part of the life-world for our research participants, the science behind the COVID-19 pandemic and vaccines is experienced as removed from and in conflict with it. The embodied, perceptually based life-world of many of our respondents contradicts the scientifically based statements, and in their decision-making they are guided by the former rather than latter. In other words, they hesitate to vaccinate because the science that supports vaccination is not verified in their life-world. Their perception-based life-world motivates them not to vaccinate, despite the science-based recommendations to do so.

In our analysis of the interview material, we identified four points of discrepancy and conflict between the life-world and the world of science that were implicated in vaccine hesitancy among our respondents. First, the experience of the scope and impact of the COVID-19 pandemic. Second, the experience of the threat the virus posed to one's health and life. Third, the experience of the effectiveness of the COVID-19 vaccines. Fourth, the experience of the safety of the vaccines.

Reality Status of the Pandemic

One aspect in which our research participants experienced the conflict between the life-world and the world of science is related to their experience of the pandemic and its presentation by official channels and media, primarily based on statistics. On the one hand, there is a concrete, embodied, and intersubjective experience of the pandemic and the life in it. On the other hand, there is the pandemic according to statistics and claims by the public institutions and authorities[5], which were responsible for or involved in the management of the pandemic in the country. Thomas, one of the research participants, reports: "I understand that many people were sick and are getting sick. Quite a few of them are getting seriously ill. But in my experience, in my family, living with my grandparents, in reality no one even got sick during the entire pandemic. I myself only got COVID for the first time about [several] months ago. […] I'm not saying that this disease doesn't exist". Thomas does not deny that the disease exists; however, the fact that he did not encounter it in his own life meant that the reality of the pandemic was somehow diminished for him. Theoretically and objectively, the disease existed, but it was not a reality for him because it lacked a perceptual basis. In this context, another interviewee, Olaf, reports that he truly realised COVID-19 really existed only in the second year of the pandemic when most people, and importantly, those around him, got sick: "And maybe at that moment you realise, yes, COVID exists, but until then it really is just something you read about and hear in the media". Similarly, our respondent Matthew who was in Ukraine when Russia's full-scale invasion began in 2022, said: "By the way, in Ukraine… On the day when the invasion began, I stood in a queue at the ATM and I noticed that it's all over, COVID had disappeared at that exact moment [when the war broke out]. No one checked anything, no masks, because… Compared to COVID, war is a completely real problem. COVID seems to be more abstract. It happens somewhere. Someone gets sick, and that's it… But war is total…"

Many respondents felt that the pandemic—as it was presented by the authorities—was not entirely real, as it simply did not reflect what they go through themselves and see happening around them in their perception-based life-world. In this context, our respondent Sandra expresses her disbelief in the pandemic as it is officially presented. She experienced a conflict between the pandemic as presented in the news and her parents' lived experience during the pandemic, which shook her taken-for-granted belief in the grim reality portrayed by the news: "[I]n March [the pandemic] began and in the summer we went to visit our elderly parents (at that time they were still unvaccinated). They told us that there was no virus there, they lived their usual life. And I understand. They didn't have any contacts, they had their own garden, they lived off what they had there. They occasionally went to the store. And they listened to the news, but not to the extent that it happens here. Encountering their reality [showed] even more [to me] how big of a bubble we have been forced to live in. In that information bubble that is brainwashed into you. Because it's alarming, the news is alarming; but we know how easy it is to change reality by telling the same things

[5] Government representatives, politicians, scientists, health-care and public health specialists (including epidemiologists, virologists and infectious disease specialists).

again and again from a self-serving position". She summarizes her experience of the pandemic by saying: "I constantly felt like I was involved in some sort of fictional affair". And Thomas expresses scepticism about how the statistics were presented in the news, leading him to rely on what he could see with his own eyes: "I understand that there are statistics you can look at, and I myself work with numbers, although I'm not a data analyst in that sense. But if I would need it [.] I could simply change the scales and show a graph that would be shocking and look scary without context, even without changing the data. So, I only look purely at what's happening around me, and if what's happening around me isn't what's being sensationalised in the media, then I don't pay much attention to it". The pandemic world, as expressed through statistics in the media, conflicted with the perceptually based life-world and, therefore, was not experienced as entirely real.

All these responses show that based on their life-world the participants saw the pandemic (presented in statistical terms) as not entirely real. It does not mean, though, that our respondents entirely denied the existence of the COVID-19 virus or pandemic. Rather, they said that its presentation to them by authorities and media was not based on what they experienced in their life-world. And this conflict between their life-world of the pandemic and the scientific world of the pandemic as presented in the media shaped their vaccine hesitancy. For example, when our respondent Elisabeth was asked what would need to happen for her to change her mind and get vaccinated, she responded: "If schools and shops were to close again; but would I believe those numbers in the statistics again? Only if I saw people around me [getting severely sick and dying], maybe". To truly believe in the severity of the pandemic, she feels the need to experience it firsthand. Only if her perceptually based life-world provided verification would it motivate her to get vaccinated.

Threat of COVID-19 Virus

The conflict between the life-world and the world of science as reflected in our interviews is true not only regarding the pandemic in general but also regarding COVID-19 symptoms in particular—the threat the virus posed to one's health and life. As our respondents reported, information about the health risks of contracting COVID-19 did not match their experience of the virus in the life-world. Thomas, who had mild COVID-19 symptoms, said: "These new variants [of COVID-19] keep coming, but nothing much really happens. Really. Compared to how it was in those videos from China, where people were collapsing on the streets and their doors welded shut, and nobody knew how to stop it. Personally, I don't know anyone who's had a really severe case [of COVID-19]. […] sure, there are cases, but it doesn't seem like they're proportional to all the fuss that's being made". Many of our participants who got sick with COVID-19 or had their acquaintances fall ill with it experienced the virus as nothing special; it was just like a normal cold, flu, or any other virus to which they have been used. Some respondents considered the symptoms so mild that no medications were needed to deal with them. Martin's experience with COVID-19 nicely summarised many respondents' experiences: "And this is it?! In short, I have already had illnesses like the famous, terrifying COVID; I'm familiar with COVIDs like this".

The respondents' life-world reality did not present the virus as deadly or as a serious health risk. So, contrary to all science-based recommendations and efforts to convince them to get vaccinated, based on their direct, concrete experience in the life-world as their evidence, they did not see the virus as a real threat; therefore, they did not see a necessity to get vaccinated against it. Our interviewee Victor, who was sick with COVID-19, reports that after experiencing relatively mild symptoms he lost any motivation to get vaccinated. Similarly, our respondent George uses his embodied experience of being ill with COVID-19 as proof he does not need a vaccine: "Because now I have the confidence that I will get over it; there is proof that I can do it quite easily, which I also proved on myself". Our respondents rely on their own embodied experiences to justify their decision not to get vaccinated.

When asked what would need to happen for them to change their minds about vaccination, our respondents spoke about needing a direct, perceptual experience of the dangers of the virus. It is this perception-based life-world experience that would motivate them to get vaccinated. As Goerge puts it: "I would need to see in real life that it actually, actually affects me". Matthew explains: "I would need to feel for myself that it is really crazy; that everyone around me is actually getting sick; that all my friends, acquaintances complain about how horrible it is. I would have to hear about how many relatives are dying. So, that I could actually sense the fear; not based on some numbers that are being published. […] So, my approach would be… well, yes. I would get vaccinated if I personally felt such personal fear; and not because of indirectly sourced information". And Thomas, similarly, states: "If I were to see that my family, God forbid, if they were to die horribly (I know it sounds brutally), if they would suffer terribly from COVID, and if I were to see that my neighbours and other people around me also suffer, I would go [and get a vaccine] for the good of society, but in this situation, when really…" So, as was the case with the pandemic in general, in the case of the virus, the self-evidences of the life-world had a higher dignity (is epistemically superior) than the scientific knowledge and, consequently, guided our respondents' actions.

Effectiveness of the COVID-19 Vaccine

The perceived ineffectiveness of the vaccine against COVID-19 is another aspect that shows how the life-world— the concrete, immediate, and perceptually-based world—shaped vaccine hesitancy. Here again, against the scientific population-based claims of the effectiveness of the COVID-19 vaccines, our respondents rather relied on their own individual-based life-world experience to assess the effectiveness and guide their decisions.[6] Based on their life-world experience, our respondents reported serious doubt about the effectiveness of vaccines. Some reported a first-hand experience of the ineffectiveness of the vaccine. They fell ill with COVID-19 not long after receiving the vaccine when the protection should be at its peak. Elisabeth did not hide her disappointment: "I had two shots. Two. But, you see, a month after the second

[6] In this context, see also Tarun Kattumana and Thomas Byrne's work (2023), where they discuss the discrepancy between the population-level and individual-level benefits and risks of COVID-19 public health interventions.

shot, I got sick. So, what was the point of that?" And later adds: "Also, for instance, no statistics [will help here]. I doubt such studies can help, forgive me, because will we believe it if it's written somewhere that vaccinated people got sick less? Will we believe that? I don't know if we will believe that. Or that vaccinated people had milder symptoms. There's no basis for that. Because there are other examples, there are various examples; so we can't simply take it at face value". Other participants also reported that both vaccinated and unvaccinated people tested positive for COVID-19. Maria said jokingly: "You know, there's this joke: what's the difference between someone who's vaccinated and someone who's not? The one who's not vaccinated doesn't die from the vaccine". The importance of the perception-based life-world experience in decision-making is also evident when our respondent Greta, when asked whether she would get vaccinated if it were promised that the vaccine would be effective for a longer period, responded: "Not just promised, but if I saw that it really happened. Anyone can promise anything. What can't be promised? [laughs] We were once promised that my generation would live under communism [laughs]. Promised! How did that end up?"

For our respondents, the vaccine's effectiveness or ineffectiveness is not based on a scientific measurement comparing the health outcomes of vaccination and its lack. Rather, it is based on their embodied, perceptual life-world estimation derived from first- or second-person experiences.

Safety of the COVID-19 Vaccine

Similarly, respondents' perceptual life-world experiences were key to their vaccine hesitancy in connection with the safety concerns related to the COVID-19 vaccines. Some participants perceived the vaccines as possible health-threats and reported ill-health after receiving the vaccine. Although all of them were not fully sure that their ill-health was caused by the vaccine, because of the timing, they could not help but feel that their ill-health was an after-effect of vaccination. For example, Martin developed chronic fatigue, weakness and memory problems after receiving the first AstraZeneca vaccine, which drastically disrupted his working life: "Well, let's say, focusing when working on a computer for an hour, an hour and a half, this insane weakness appears that you even need to take a nap in the middle of the day. But then you go to sleep and basically you sleep until morning. And it's like this for a month without options. Even longer, all of April and part of May. Just like that. And the feeling is such that you know if you start to overburden yourself intellectually, you will very quickly experience this dreadful sense of fatigue and mild headaches, dizziness. And you start to become simply afraid of it, and you begin to avoid that intellectual effort, to which you are accustomed for work needs, where you really need to keep something in mind, constantly remember. And I've never really complained about memory, never…". Despite this very unpleasant experience, he decided to go for the second jab to complete the immunisation series and experienced the same symptoms, although for a shorter period. In comparison, a little more than half a year after receiving the last jab, he got sick with COVID-19. Martin summarised his experience of receiving two vaccines in these words: "The result is that, to tell you the truth, this time the vaccines have kicked me harder than COVID. Significantly harder [laughs],

although, of course, it's hard to verify that". The negative experience with the vaccine motivated Martin's decision not to get vaccinated again.

Our participants also mentioned people they knew who suspiciously died, or whose health deteriorated after receiving the vaccine. Sandra, for example, reported that one of her parents and other elderly people in the neighbourhood had a stroke not long after getting vaccinated. She said: "[Y]ou can imagine who I was blaming in all of it, hmm. Because in that, in our neighbourhood, where older people live, in one block four [people] within one month had a stroke. That seems a lot, and then again… few months ago they all had, they all [received the vaccine]. And for me, of course… I make conclusions, but I don't talk about it loudly, because I know how I will be perceived for it". So, although statistically a vaccine is a safe preventative measure, our respondents' perception-based life-world disagreed. Although our participants knew they could not be certain that the ill-health was caused by the vaccine, their perception-based experience led them to feel that the vaccine was responsible.

Conclusion

This article explored one aspect of how the life-world is implicated in vaccine hesitancy, based on the results of our phenomenologically grounded qualitative study. As we showed, the perceptual and taken-for-granted character of the life-world serves as the ultimate ground guiding people's decisions and actions, including those on vaccination. As embodied beings, we live in a concrete and perceptual world, rather than in a purely intellectual world of abstract numbers, equations, laws, and units. Therefore, scientific knowledge, explanations, and arguments, which are removed from, and which conflict with, the perceptions and interactions of the everyday world, fail to speak to and convince people. And, while the life-world is not limited to what is purely perceptually given and can incorporate scientific knowledge, not all scientific knowledge has its place in the life-world for all of us as the self-evident and taken-for-granted world of our every-day life on which we constantly rely.

Statistics and the results of clinical trials are not the lived reality for many, and our interview material reveals differences and conflicts between the world of scientific data and the life-world, which are resolved in favor of the life-world. While the perceived threat of the virus, the effectiveness of the vaccine, and the safety concerns regarding vaccination are well-established factors behind vaccine hesitancy (Troiano & Nardi, 2021), they have not yet been contextualised within the life-world as the realm of embodied self-evidences that show us what is real and motivates our practical decisions and actions in the world. Our participants' concerns about the effectiveness and safety of the vaccine, or the health risks of the virus, are rooted in their concrete, perceptually given life-world. For example, the issue is not about vaccine safety per se, but rather about the conflict between vaccine safety according to science and according to one's embodied and perceptually based life-world, with the latter holding epistemic superiority. While the scientific community may regard individuals' subjective-relative life-world experience as lower-level evidence in the hierarchy of scientific evidence, individuals themselves consider such experiences as the highest. When the life-world and the world of science conflict, for those making

practical decisions in their lives, the life-world holds epistemic superiority over the world of science.

Reliance on the life-world does not make vaccine-hesitant people necessarily more or less irrational than those who got willingly vaccinated (about vice-charging see Cassam, 2023). Non-hesitant people also rely on their life-world to make decisions. The difference is that individuals who were COVID-19 vaccine hesitant have a life-world different from that of those who accept the vaccine. For example, for non-hesitant persons compared to hesitant persons, based on their direct, concrete perception-based experience, the pandemic might be a frightening reality, the virus a serious health risk, and the vaccine a safe and effective preventative measure—motivating them to accept the vaccine. It is not so much about who is more rational, but rather about what one's life-world is— namely, what they take for granted and accept as obvious; whom they trust; and what they rely on making their decisions.

Though our method primarily aimed to disclose experiential possibilities rather than facts and the selected sample might not be representative, we think that the insights presented in this article, besides being operationalised in further quantitative studies, could be used also to inform public health-related policies and communication strategies. For example, our research demonstrates limitations to a techno-fix approach or techno-solutionism to public health where technological solutions are regarded as the "privileged modes of intervention […], which tend to erase contextual factors and marginalize other rationales, values, and social functions that do not explicitly support technology-based innovation efforts" (Marelli et al., 2022: 1). While immunization might provide a solution to an outbreak, it cannot do so if people refuse to get vaccinated. The pandemic and the vaccine as its solution should be addressed with the experiential, embodied, and socio-politically embedded context in mind. Considering that the life-world holds what people take for real and drives people's decisions and actions, special focus should be on what shapes their life-world.

Another related important aspect concerns the use of the "knowledge deficit model of communication" in public health interventions, which implies that people make wrong decisions because of the lack of proper scientific knowledge and disinformation. This model implies that supplying scientific knowledge in an accessible form and fighting misinformation will fix the problem. Though suggestions have been made in scientific literature to move away from this model (Dubé et al., 2013: 1767), in Latvia this model was used as a part of the vaccination campaign. As our research shows, the life-world has epistemic superiority over scientific knowledge. Therefore, communication based on the understanding of target groups' life-world should be more effective. It is not enough to convey scientific information or present scientific arguments and data to support it. They must be related to, contextualised within, and consistent with the life-world.

Finally, our study has limitations. The first limitation was the volunteer bias, as our participants could choose if they wanted to participate in our study. Our study could have potentially excluded many who were extremely suspicious of the government or government-funded research (which this research was). Owing to the specific socio-political context in which our participants' experiences were embedded, the results might not be generalisable to other countries and socio-political contexts. Similarly, our study is also limited to the specific context of the COVID-19 pandemic and the

COVID-19 vaccine. Lastly, while we chose to focus on vaccine hesitancy from the conceptual perspective of the life-world, first, this focus was limited to the perceptual dimension as one specific motivational aspect of the life-world, leaving aside others. For instance, one's social surroundings, cultural beliefs, and political alignment—components of the cultural life-world—also shape attitudes toward vaccination. And, second, there are other experiential aspects and phenomenological concepts, beyond the life-world, that are important for understanding the complex phenomenon of vaccine hesitancy, such as bodily certainty, normality, bodily memory, and bodily autonomy.

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Data Availability The dataset generated and analysed during the current study is available in the Zenodo repository, https://doi.org/10.5281/zenodo.11108296.

Declarations

Informed Consent All participants provided informed consent before participating in the research study.

Research Involving Human Participants Research project "Hesitant bodies: phenomenological analysis of the embodied experience of vaccine hesitancy" (No. lzp-2021/1-0360), within which this article is prepared, has received approval from the University of Latvia Human and Social Sciences Ethics Committee (approval number: 71-43/1).

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